Research Article

Azizeh Pashaei, Mohammad Hassani*, Behnaz Mohajeran, Kiumars Shahbazi


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Abstract: Adequate financial decision-making necessitates a solid foundation in financial literacy and comprehension of its principles. This is particularly crucial for students, as their financial and behavioral choices can significantly impact their future financial and career prospects. Consequently, the present study aimed to explore the causal links between economics education, financial literacy, decision-making abilities, and entrepreneurial intentions. Employing a descriptive-correlational approach, the researchers utilized structural equation modeling, drawing on a sample of 375 individuals purposefully selected from a population of 11,345 students at Urmia University. Data were collected through a questionnaire, and the research variables were initially assessed using multiple correspondence analysis. Subsequently, the research model was estimated. The findings revealed a positive and substantial impact of economics education on students' financial literacy and the influence of economics education on decision-making skills and entrepreneurial intentions through the mediating factor of financial literacy. Furthermore, the results confirmed the moderating role of socioeconomic status in the relationship between economics education and financial literacy. Consequently, the study's outcomes can inform educational institutions and policymakers, supporting the implementation of policies aimed at enhancing general economic education and emphasizing the equitable and distributive nature of such initiatives.

Keywords: economics education, financial literacy, risk preferences, social preferences, probabilistic beliefs, entrepreneurial intention, socio-economic status

1 Introduction

Given the complexity of financial markets, the development of financial institutions’ activities, and their continuous efforts to increase market share, the necessity of financial literacy has become of great importance. In addition, understanding the concepts and skills related to financial literacy has become necessary to enable the consumer to survive in modern society and to resist the diversity and complexity of the existing financial products (Almenberg & Dreber, 2015). Hence, knowing how financial literacy is achieved and how and whether it can be taught is of great importance (Corsini & Giannelli, 2021). According to Lusardi and Mitchell (2023), individuals who are financially literate are better able to understand the various factors that influence their financial decisions throughout their lives and are more able to anticipate the causes and outcomes of low financial literacy appropriately. There is a need for basic financial literacy to make effective financial planning decisions, as individuals are expected to take incremental responsibility for their financial affairs (Mustafa et al., 2023). But increasing evidence shows that people tend to make systematic errors in judgment and decision-making, and there is a high level of heterogeneity in the degree of limited rationality among people’s decisions, and the loss of well-being caused by poor decisions can be significant (Choi, Kariv, Müller, & Silverman, 2014). Changing the motivations, rebuilding the principles of selection, and correct training are ways to improve the quality of decision-making (Morewedge et al., 2015; Volpp et al., 2009). The economics curriculum enables students to understand and calculate probabilities and demonstrate higher quality decision-making in investment and risk, and this education plays an important role in shaping social preferences and how people interact with others (Chen,
According to different researchers, an increase in the level of financial literacy increases the level of risk tolerance (e.g., Fisher & Yao, 2017; Kannadhasan, 2015; Kumar, Kambuya, Jamil, & Muneer, 2015; Mahdizan, Mohd-Ary, & Chan, 2017; Mishra & Mishra, 2016; Pinjisakikool, 2018; Sharma, Chalise, & Dangol, 2017; Yong & Tan, 2017). Higher levels of financial literacy have a significant impact on people and help them have fewer problems in the decision-making process (Kumar, Pillai, Kumar, & Tabash, 2023). In addition, personal traits such as gender, employment status, and household income are key factors affecting financial literacy, and there is a strong relationship between education and advanced financial literacy (Shen, Lin, Tang, & Hsiao, 2016). Therefore, governments are globally interested in finding appropriate approaches and solutions to improve people's financial literacy by developing national strategies to present learning opportunities at different levels of education (Atkinson & Messy, 2012). Evidence for the causal impact of education on decision-making is mixed. On the one hand, Banks, Carvalho, and Perez-Arce (2019) find that an additional year of required education has no significant impact on the quality of decision-making (Banks et al., 2019). On the other hand, a randomly assigned financial education program seems to improve students' decision-making successfully (Kim, Choi, Kim, & Pop-Eleches, 2018; Luhrmann, Serra-Garcia, & Winter, 2018). Such mixed results raise the idea that the content of education in particular, studying economics may determine whether education has a causal impact on decision-making (Chen et al., 2021). However, Li and Qian (2020) found that individuals' entrepreneurial intentions and business development are influenced by financial literacy. It has been reported that small- and medium-sized businesses and entrepreneurship are vital forces behind economic development and growth and can decrease the level of poverty (Al-Mamary, Abdulrab, Alważheeb, & Alshammar, 2020; Alshebami, 2021; Cai, Murad, Ashraf, & Naz, 2021; Chew, Tang, & Buck, 2022; Li et al., 2020). In addition, they assist individuals in creating novel objectives, goods, and services that raise living standards (Ali, Ali, Badghish, & Soomro, 2021). Early planning would be necessary to foster an entrepreneurial intent in people, especially potential entrepreneurs (eligible students). For instance, people need to be highly self-assured, risk-tolerant, and open to innovation (Nasip, Amirul, Sondoh, & Takanjila, 2017). The intention is fundamental when choosing whether to launch a new business venture (Barba-Sánchez & Atienza-Sahuquillo, 2018). Further, by cooperating with the government, business, and society, higher education institutions can foster entrepreneurial behavior by utilizing their diverse knowledge and skills (O’Brien & Cooney, 2019).

Iran is a developing nation seeking economic growth and a stable income through innovative economics. To ensure economic prosperity, individuals with entrepreneurial capabilities and influential skills for decision-making must be trained, and this issue should be considered in universities. One of Iran's universities, Urmia University, was founded in 1965 in Urmia, West Azerbaijan province. With 837 administrative staff, 532 faculty members and scholarship holders, more than 17,000 students, five research institutes, 11 faculties, and higher education centers, a language training center, and a university campus, this university continues to pursue its educational goals and research activities. Despite academic instruction, the educational system should also provide students with modern skills and knowledge to prepare them for entering the workforce and their role as economic activists, future decision-makers, and entrepreneurs in the nation. Financial literacy is becoming increasingly important in the lives and careers of young people. Accordingly, Urmia University offers undergraduate students both fundamental and specialist units in economics, including accounting, general economics, financial and budget foundations, engineering economics, and economic plan evaluation. Our research aims to address the effect of economics education on financial literacy and decision-making skills, and our criterion for selecting the statistical sample of this study is to pass all these units. The study also attempts to find out how the students at Urmia University want to pursue entrepreneurship, given the moderating influence of family socioeconomic status. Figure 1 displays the conceptual model of this study.

2 Literature Reviews

2.1 Financial Literacy

These days, having financial management methods and skills for collecting, analyzing, and using financial data are essential due to the diversity, complexity, and quick development of financial markets (Lusardi & Mitchell, 2011). According to Nayeemhoseni, Khalifehsultani, and Hejazi (2022), individuals who are less equipped to handle dynamic, complicated events suffer the most because they lack the knowledge and expertise necessary to prevent financial mismanagement. An individual's financial empowerment and well-being heavily depend on their level of financial literacy or financial awareness (Ali et al., 2021). In fact, as mentioned by Li and Qian (2020), financial literacy is the capacity to understand and apply basic financial principles to allocate financial resources and spot market
opportunities effectively. According to Hung, Parker, and Yoong (2009), financial literacy is the knowledge and skills needed to manage financial resources and confidently make financial decisions. Financial literacy is defined by the Organization for Economic Co-operation and Development (OECD, 2014) as the ability to make informed decisions in various financial contexts, enhance societal and individual financial well-being, and facilitate economic participation. It also includes sufficient knowledge and understanding of financial concepts and risks. Only people with the necessary information and application abilities regarding the decision situations they encounter may make well-informed financial decisions. According to Cole, Sampson, and Zia (2011), those without strong financial literacy are more likely to make poor financial decisions.

2.2 Decision-Making Skills

According to decision theory, people cannot make decisions or choose an option until they set criteria to satisfy their expectations (Shokrizadeh & Mazaheri, 2021). Individuals’ risk preferences are one of the most important markers in investors’ behavioral and psychological examination. Risk preferences are an important consideration in analyzing investor behavior and decision-making processes, which are related to an individual’s attitude toward risk (Borio, Kennedy, & Prowse, 1994). There are notable changes in the risk priorities of students who study economics. In particular, individuals majoring in non-economic subjects but with comparable risk preferences demonstrate a neutral position in comparison to those with an academic background in economics (Rabin, 2013). Risk and uncertainty are two different concepts in management. According to Ghabadi Alwar, Mousavi, and Shariatnejad (2018), a situation is considered risky if there is a clear possibility of uncertainty but an unclear chance of it. The risk in the Knight (1921) formula relates to circumstances where outcomes are known or knowable, enabling estimation based on historical data and computation in accordance with probability laws (Knight, 1921).

On the other hand, circumstances where potential outcomes are neither known nor objectively determinable or calculable are referred to as uncertain. Subjective probability can be utilized to lessen this distinction. This method decreases the difficulty of making decisions in the face of ambiguity by substituting subjective probabilities and beliefs for objective possibilities when they are unknown. When it comes to economics, it is common procedure to presume that people have probability assumptions about each source of uncertainty. These assumptions serve as the cornerstone for optimizing predicted utility and are updated on a regular basis. This paradigm offers a dependable approach to dealing with ambiguity (Gilboa, Postlawaite, & Schmeidler, 2008). High financial literacy makes it simple for people to acquire the required risk management abilities, spot potential business ventures, learn more about the industry, manage their money more wisely, and make better financial decisions – all of which are essential for the expansion of venture creation (Hilgert, Hogarth, & Beverly, 2003; Klapper, Lusardi, & Van Oudheusden, 2015; Li & Qian, 2020; Qader et al., 2022). As a result of numerous education initiatives, people’s financial literacy will likely increase, increasing demand for financial products with varying risk profiles and supporting the growth of the financial industry (Bayar, Sezgin, Öztürk, & Şamız, 2020). In the last 20 years, there has been a discernible movement in the focus of research in experimental economics and rational choice theory toward social preferences. Simple behavioral games have been used in experimental investigations to seriously challenge egoism and
repeatedly highlight the fact that people typically make decisions that take other people’s well-being into account (Fehr & Gintis, 2007; Henrich et al., 2007). As a result, new models that go beyond narrow self-interest have been created, and societal preferences have significantly impacted how cooperation has evolved. They have deterministic interactions with motivational structures; therefore, a certain number of decision-makers with reciprocal social preferences can result in radically different results (Diekmann, Jann, Przepiorka, & Wehrl, 2014; Gurerk, Irlenbusch, & Rockenbach, 2006). People differ from one another in what they prefer, and this influences how they participate. As a result, social preferences—which include personality traits or persistent individual differences in one’s preferences for allocating resources between oneself and others—have drawn the attention of psychologists. These preferences do not change much over time or differ much between people from different socioeconomic backgrounds and cultures (Murphy & Ackermann, 2014).

2.3 Entrepreneurial Intention

Businesses, governmental agencies, and legislative bodies have all given entrepreneurship development special attention as a result of the economic and social progress brought about by entrepreneurship, especially in emerging nations (Guo, He, & Li, 2016; Mensah, Zeng, Luo, Xiao, & Lu, 2021). Accordingly, entrepreneurship is frequently perceived as a vital economic engine and a booster for the expansion and well-being of the global economy (Gieure, del Mar Benavides-Espinosa, & Roig-Dobón, 2021). It is regarded as a cutting-edge tactic in the global community that can be depended upon to lower unemployment while also promoting social advancement and economic development (Coulibaly, Erbao, & Mekongcho, 2018). According to most entrepreneurship academics, a sizable portion of what is referred to as entrepreneurial activity is the direct outcome of individual intentions and subsequent actions over an extended period (Grande, Madsen, & Borch, 2011; Gupta & Gupta, 2015). Entrepreneurial intention is characterized as a vital step in an entrepreneurial plan at any time a person intends to launch a new business. It demonstrates the driving force behind why someone will act on predetermined decisions (Salamzadeh, Sangosanya, Salamzadeh, & Braga, 2022). Financial literacy aids in preparing people with entrepreneurial intent, financial sources, market awareness, and financial skills (Hilgert et al., 2003; Li & Qian, 2020; Miller, Godfrey, Levesque, & Stark, 2009). A high degree of financial literacy can provide people with the knowledge and abilities they need to make wise financial decisions and investments, raise their standard of living, become more financially independent, and feel more confident and independent (Ali et al., 2021; Gilenko & Chernova, 2021; Philippas & Avdoulas, 2021; Sohn, Joo, Grable, Lee, & Kim, 2012). Higher authorities in underdeveloped nations need to emphasize the importance of entrepreneurial intentions in educational settings more (Ramadani, Rahman, Salamzadeh, Rahaman, & Abazi-Allil, 2022). Policies have to be the driving force behind changing students’ perceptions of entrepreneurship, encouraging them to consider it as a workable future solution, and cultivating an entrepreneurial culture (De Jorge-Moreno et al., 2012).

2.4 Aims and Hypotheses Development

According to the investigation by Chen et al. (2021) on the relationship between financial literacy and economics education and decision-making, students who take economics courses outperform their peers when it comes to social and investment judgments. Actually, adults who participate in financial education programs in school and university have higher levels of financial literacy (Stella, Filotto, Cerrellati, & Graziano, 2020). However, supplementary financial training is necessary to fully introduce students to the wide range of activities comprising financial literacy (Cordeiro & Pedraja, 2019). Decision-making improves when more financially literate (Trazodar, Ghasemi, & Mohseni, 2023). Higher financial literacy increases the likelihood of people making prudent selections when taking on riskier company investments (Gilenko & Chernova, 2021; Mustafa et al., 2023). In their research, Muzakky and Suekarno (2021) concluded that there is a substantial correlation between risk preference and financial literacy. According to Mudzingiri (2019), students with poor levels of financial literacy have risk preferences that are correlated with their financial literacy. Financial knowledge significantly influences risk perception (Bayrakdaroglu, Universitesi, Kuyu, & Universitesi, 2019). The following study assumptions are established based on the review:

- **H1**: Economics education is effective on students’ financial literacy.
- **H2**: Economics education affects students’ probabilistic beliefs.
- **H3**: Economics education contributes to students’ risk preferences.
H4: Economics education plays a role in students’ social preferences
H5: Financial literacy affects students’ probabilistic beliefs.
H6: Financial literacy exerts a role in students’ risk preferences.
H7: Financial literacy has an effect on students’ social preferences.

A high degree of financial literacy among people in general and among youth in particular may help encourage entrepreneurial endeavors such as self-employment and motivation (Li & Qian, 2020; Oseifuah, 2010). The effect of financial literacy on entrepreneurial ambition was examined by Alshebami and Al Marri (2022) and Hasan et al. (2020), who found that there is a direct correlation between the two. De Jorge-Moreno et al. (2012), in their research, have pointed out the positive effect of business and economics educational programs on students’ entrepreneurial intentions. The following study assumptions are established based on the review:

H8: Economics education influences students’ entrepreneurial intentions.
H9: Financial literacy contributes to students’ entrepreneurial intentions.

People’s financial literacy rises with age, risk-taking, family income, parental employment, high working experience, and involvement in educational programs. Higher financial literacy makes people more successful in both their personal and professional lives (Cude, 2010; Potrich, Vieira, & Kirch, 2015; Tang, Baker, & Peter, 2015). A person’s financial literacy is higher when their parents are educated. These people make more money and have future-focused financial plans. In addition, they have better financial circumstances in retirement, while some educated family members have gone bankrupt (O’Neill et al., 2005). The following study assumptions are established based on the review:

H10: The family’s socioeconomic status moderates the relationship between economic education and financial literacy.

3 Method

The current research is an applied study in terms of purpose and descriptive-correlational in terms of data collection method based on structural equation modeling. In the analytical model, economics education and financial literacy are independent and mediating variables. Risk preferences, social preferences, possible beliefs, and entrepreneurial intention are also dependent variables. In addition, the socioeconomic status of the family is the moderating variable. The statistical population of this study includes all students studying at Urmia University in the academic year 2021–2022 (N = 11,345). The statistical sample contains 375 people based on Krejcie and Morgan’s table. Due to the different faculties in which the students study, a random sampling method was used to select the sample. A questionnaire was employed for data collection and questionnaires were all standard, and their validity and reliability have been tested previously. However, validity and reliability were investigated again based on the modifications made in some questionnaires and their localization according to the existing conditions. The content validity ratio (CVR) was utilized to check the validity of the questionnaires. Hence, the initial questionnaire was distributed among several experts in the fields of educational management and economics, and the CVR was calculated for all questions based on the evaluation of experts. Most questions had a high CVR, and the questions with a CVR of less than 0.62 were excluded from the test. Cronbach’s alpha was employed to evaluate the reliability of the research instruments, which according to Table 1 was greater than 0.7 for all questionnaires; thus, the instruments had the necessary reliability.

In this research, risk preference, social preferences, possible beliefs, socioeconomic status, and financial literacy were calculated using the Multiple Correspondence Analysis (MCA) by XLSTAT 2019 software, and then, the given model was estimated using the Generalized Structural Equation Model by Stata 17 software.

When there are no preconceived notions about the characteristics of the variables, MCA is an exploratory data analysis technique that is used to find systematic links between them. This technique provides a thorough description and analysis while also successfully simplifying complex data. Correspondence analysis is expanded upon by MCA, which focuses on the patterns of relationships between dependent categorized variables. It is an effective tool for non-quantitative category data analysis. A statistical technique called generalized structural equation modeling (GSEM) is frequently used to examine binary or classified variables in addition to ordinal and categorical data. Researchers can measure latent variables and their interrelationships using this method. GSEM is highly helpful in modeling latent variable scenarios since it integrates structural and generalized linear modeling approaches.

4 Findings

The first part of the questionnaire consisted of the demographic information of Urmia University students, the data
of which are provided in Table 2. Most participants of the sample group were males and from the technical and engineering major.

Table 3 presents descriptive indices of the variables, including mean, standard deviation, skewness, and kurtosis. The variables' mean and standard deviation indices indicate the appropriate dispersion of the data, and the skewness and kurtosis indices represent the normality of the distribution of the research variables. In causal modeling, the distribution of variables should be normal. The absolute value of skewness and kurtosis of the variables should not be more than 3 and 10, respectively. Based on data in Table 3, the absolute values of the skewness and kurtosis of all variables are lower than the mentioned values. Therefore, the assumption of causal modeling, including univariate normality, is satisfied.

To examine the main hypothesis of the research in accordance with the researcher's conceptual framework, the variables' indices were extracted using multiple regression analysis by XLSTAT 2019 software. Then, generalized structural equations were used to estimate the model by the Stata 17 software.

As shown in Figure 2, axis 1 separates the presence or absence of financial literacy on the left and right sides, respectively. In other words, in this diagram, all options related to correct answers (1) to financial literacy questions are on the left, while all options attributed to incorrect answers (0) to financial literacy questions are on the right of the vertical axis. Therefore, the first axis, which includes a large part of the total inertia (59.64%), reveals the complementary and cumulative feature of having financial resources. Finally, as mentioned, in the MCA methodology, the horizontal axis in Figure 2 represents the financial literacy index, and according to the diagram, it is possible to compare the students of different fields and their financial literacy.

The given dimensions in Table 4 were extracted to maximize the distances between row and column elements; they explain successive dimensions of the Chi-square value (inertia equals Pearson's Chi-square divided by the total sample volume) as less as possible. Therefore, extracting these dimensions is similar to extracting the principal components in factor analysis. Based on the data, it seems that 59.64% of inertia can be explained with one dimension, and two dimensions of the table together can explain 77.55%. According to the high indices of Eigenvalue and Variability%, in column F1, the results of column F1 were used in subsequent analyses in the Stata software. The graphs and tables of the extracted indicators for the rest of the variables are presented in Table 5.

Based on the results of Table 5 and Figure 3, one dimension of the table can account for 7.28% of inertia, whereas the two dimensions taken together account for 11.72%.

### Table 1: Reliability coefficient of research variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of Items</th>
<th>Cronbach’s Alpha</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socioeconomic status</td>
<td>5</td>
<td>0.72</td>
<td>(Ghodrat Nama, Heydari Nejad, &amp; Davoudi, 2013)</td>
</tr>
<tr>
<td>Risk-taking</td>
<td>4</td>
<td>0.75</td>
<td>(Segal, Borgia, &amp; Schoenfeld, 2005)</td>
</tr>
<tr>
<td>Social norms</td>
<td>25</td>
<td>0.72</td>
<td>(Elster, 1989)</td>
</tr>
<tr>
<td>Probabilistic beliefs</td>
<td>10</td>
<td>0.72</td>
<td>(Afantiti-Lamprianou &amp; Williams, 2003)</td>
</tr>
<tr>
<td>Entrepreneurship intention</td>
<td>6</td>
<td>0.90</td>
<td>(Liñán, Rodríguez-Cohard, &amp; Rueda-Cantuche, 2011)</td>
</tr>
<tr>
<td>Financial literacy</td>
<td>4</td>
<td>0.77</td>
<td>(Corsini &amp; Giannelli, 2021; Lusardi &amp; Mitchell, 2011)</td>
</tr>
</tbody>
</table>

### Table 2: Demographic information of the participants

<table>
<thead>
<tr>
<th>Gender</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Man</td>
<td>221</td>
<td>58.9</td>
</tr>
<tr>
<td>Woman</td>
<td>154</td>
<td>41.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Economics education</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Passed economics courses</td>
<td>221</td>
<td>58.9</td>
</tr>
<tr>
<td>Did not pass the economics courses</td>
<td>154</td>
<td>41.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature and human sciences</td>
<td>104</td>
<td>27.73</td>
</tr>
<tr>
<td>Technical and engineering</td>
<td>194</td>
<td>51.73</td>
</tr>
<tr>
<td>Business Management</td>
<td>77</td>
<td>20.53</td>
</tr>
<tr>
<td>Total</td>
<td>375</td>
<td>100</td>
</tr>
</tbody>
</table>

### Table 3: Descriptive statistics of research variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Kurtosis</th>
<th>Skewness</th>
<th>SD</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socioeconomic status</td>
<td>−0.41</td>
<td>0.08</td>
<td>0.73</td>
<td>2.77</td>
</tr>
<tr>
<td>Risk preferences</td>
<td>−0.16</td>
<td>0.28</td>
<td>0.52</td>
<td>3.42</td>
</tr>
<tr>
<td>Social preferences</td>
<td>0.41</td>
<td>−0.10</td>
<td>0.44</td>
<td>4.12</td>
</tr>
<tr>
<td>Probabilistic beliefs</td>
<td>−0.49</td>
<td>0.18</td>
<td>0.21</td>
<td>0.43</td>
</tr>
<tr>
<td>Financial literacy</td>
<td>−0.36</td>
<td>−0.25</td>
<td>0.37</td>
<td>0.54</td>
</tr>
<tr>
<td>Entrepreneurship intention</td>
<td>0.91</td>
<td>−0.02</td>
<td>0.74</td>
<td>3.67</td>
</tr>
</tbody>
</table>

Note. SD, Standard deviation.
Based on the data Table 6 and Figure 4, social preferences account for 5.82% of inertia, while the two table dimensions taken together account for 10.47%.

Based on the findings Table 7 and Figure 5, probabilistic beliefs can account for 21.07% of inertia, while the two table dimensions taken together account for 34.37%.

The data in Table 8 and Figure 6 indicate that entrepreneurship purpose can account for 15.51% of inertia, whereas the combined contributions of the two table dimensions can account for 27.27%.

The results of Table 9 and Figure 7 imply that socioeconomic class may account for 13.24% of inertia, whereas the combination of the two table dimensions can account for 21.90%.

Structural equation modeling can be used to investigate the effects of the independent variable on the dependent and mediator variables, as indicated in the research’s conceptual model. The following equations are employed in this regard:

\[ R_{pi} = \beta_{oi} + \beta_{ui} \ast (Ee_{i}) + \beta_{u2} \ast (Fl_{i}) + \beta_{ui} \ast (Ee_{i} \ast Ses_{i}) + r_{1} \]
\[ Sp_{ij} = \lambda_{oi} + \lambda_{ui} \ast (Ee_{i}) + \lambda_{ui} \ast (Fl_{i}) + \lambda_{ui} \ast (Ee_{i} \ast Ses_{i}) + r_{2} \]
\[ Pb_{i} = y_{ij} + y_{ui} \ast (Ee_{i}) + y_{ui} \ast (Fl_{i}) + y_{ui} \ast (Ee_{i} \ast Ses_{i}) + r_{3} \]
\[ Ei_{i} = a_{oi} + a_{ui} \ast (Ee_{i}) + a_{ui} \ast (Fl_{i}) + a_{ui} \ast (Ee_{i} \ast Ses_{i}) + r_{4} \]

Note: Ee_{i}, economic education; Fl_{i}, financial literacy; Ses_{i}, socioeconomic status; R_{pi}, risk preferences; Sp_{ij}, social preferences.

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**Table 4: MCA of financial literacy**

<table>
<thead>
<tr>
<th></th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eigenvalue</td>
<td>0.59</td>
<td>0.17</td>
<td>0.12</td>
<td>0.09</td>
</tr>
<tr>
<td>Variability (%)</td>
<td>59.64</td>
<td>17.91</td>
<td>12.72</td>
<td>9.72</td>
</tr>
<tr>
<td>Cumulative (%)</td>
<td>59.64</td>
<td>77.55</td>
<td>90.28</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Table 5: MCA of risk preferences**

<table>
<thead>
<tr>
<th></th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eigenvalue</td>
<td>0.45</td>
<td>0.35</td>
<td>0.33</td>
<td>0.28</td>
</tr>
<tr>
<td>Variability (%)</td>
<td>11.29</td>
<td>8.93</td>
<td>8.30</td>
<td>7.15</td>
</tr>
<tr>
<td>Cumulative (%)</td>
<td>11.29</td>
<td>20.22</td>
<td>28.52</td>
<td>35.68</td>
</tr>
</tbody>
</table>

**Table 6: MCA of social preferences**

<table>
<thead>
<tr>
<th></th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eigenvalue</td>
<td>0.23</td>
<td>0.18</td>
<td>0.13</td>
<td>0.11</td>
</tr>
<tr>
<td>Variability (%)</td>
<td>5.82</td>
<td>4.64</td>
<td>3.24</td>
<td>2.85</td>
</tr>
<tr>
<td>Cumulative (%)</td>
<td>5.82</td>
<td>10.47</td>
<td>13.71</td>
<td>16.57</td>
</tr>
</tbody>
</table>
preferences; \( P_{bi} \), probabilistic beliefs; and \( E_{ni} \), entrepreneurship intention).

According to Table 10 and Figure 8, the value of the \( z \) coefficients of each path is more than 1.96 (\( p < 0.05 \)); as a result, all research hypotheses are verified. However, considering that the indirect effects of variables are not calculated in Stata software, according to Table 11 the Sobel test was used to estimate the indirect effect and mediation of financial literacy in the relationship between economics education, decision-making skills, and entrepreneurial intention.

Based on the results of Table 6, the value of the \( z \) statistic for all routes is higher than 1.96, and the
significance level is lower than 0.05. Therefore, the mediating role of financial literacy in the relationship between economic education and risk preferences, social preferences, probabilistic beliefs, and entrepreneurial intention is confirmed, and economic education through financial literacy affects decision-making variables and entrepreneurial intention.

5 Discussion

The presented study aimed to investigate the causal relationship between economics education, financial literacy, decision-making skills and entrepreneurial intention. Based on the results, all the main hypotheses of the research were verified; thus, economics education was effective in financial literacy. Furthermore, economics education affected the decision-making skills (probabilistic beliefs, risk preferences, and social preferences) and entrepreneurial intention of students through financial literacy, and students studying economics outperformed compared to the rest of the students in the relevant variables.

About the effect of economics education on students’ financial literacy, according to the value of the z-statistic, which was 14.6 ($p < 0.01$) and greater than 2.57, it can be confirmed with a confidence interval of 99% that this variable has a direct, positive, and significant impact on students’ financial literacy. This finding is consistent with the results of some other studies (Corsini & Giannelli, 2021; Kaiser & Menkhoff, 2017; Meier & Sprenger, 2013). Individuals who choose to participate in financial education programs make superior financial decisions and act more confidently in making investment decisions after participating in these workshops for a period. Therefore, understanding how financial literacy is achieved and how and whether it can be taught is of great significance. Various governments motivate their citizens to save more and more appropriately and make them aware of the significance of saving and having proper financial education in certain cases (Corsini & Giannelli, 2021). Globally, governments are interested in finding suitable strategies and solutions to improve individuals’ financial literacy by developing national strategies to provide learning opportunities at various levels of education (Atkinson & Messy, 2012). Although

<table>
<thead>
<tr>
<th>Variable</th>
<th>Path coefficient</th>
<th>Z-Statistics</th>
<th>Significance level</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>From economics education on</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial literacy</td>
<td>0.2</td>
<td>14.60</td>
<td>0.00</td>
<td>Supported</td>
</tr>
<tr>
<td>Probabilistic beliefs</td>
<td>0.038</td>
<td>3.93</td>
<td>0.03</td>
<td>Supported</td>
</tr>
<tr>
<td>Risk preferences</td>
<td>0.053</td>
<td>4.08</td>
<td>0.00</td>
<td>Supported</td>
</tr>
<tr>
<td>Social preferences</td>
<td>−0.032</td>
<td>−4.09</td>
<td>0.00</td>
<td>Supported</td>
</tr>
<tr>
<td>Entrepreneurship intention</td>
<td>0.079</td>
<td>4.89</td>
<td>0.00</td>
<td>Supported</td>
</tr>
<tr>
<td>From financial literacy on</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probabilistic beliefs</td>
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<td>2.09</td>
<td>0.05</td>
<td>Supported</td>
</tr>
<tr>
<td>Risk preferences</td>
<td>0.14</td>
<td>3.26</td>
<td>0.00</td>
<td>Supported</td>
</tr>
<tr>
<td>Social preferences</td>
<td>−0.081</td>
<td>−3.16</td>
<td>0.00</td>
<td>Supported</td>
</tr>
<tr>
<td>Entrepreneurship intention</td>
<td>0.22</td>
<td>4.09</td>
<td>0.00</td>
<td>Supported</td>
</tr>
<tr>
<td>The moderating effect of the socio-economic status of the family</td>
<td>0.34</td>
<td>2.40</td>
<td>0.05</td>
<td>Supported</td>
</tr>
</tbody>
</table>
the general finding highlights more heterogeneity in the effectiveness of financial education programs (Walstad et al., 2017), the effect of these programs is generally positive (Kaiser & Menkhoff, 2017). A randomly assigned financial education program seems to improve students’ decision-making successfully (Luhrmann et al., 2018).

Regarding the impact of economics education and financial literacy on students’ possible beliefs, according to the value of z-statistics, which equals 3.93 and 2.09 (p < 0.05) and greater than 1.96, it can be confirmed with a confidence interval of 95% that economics education and financial literacy had a direct, positive, and significant effect on students’ probabilistic beliefs. The results of some other studies (Almenberg & Dreber, 2015; Fernandes, Lynch, & Netemeyer, 2014; Sachse, Jungermann, & Belting, 2012; Sadzik, 2021; Van Rooij, Lusardi, & Alessie, 2011; Zhang, 2022) are in line with those of the present study.

Objective probabilities can be replaced with subjective probabilities if they are not recognized since decision-making problems are reduced to risk-based decision-making problems under uncertainty conditions. In economics, it is assumed that people have probabilistic beliefs about each source of uncertainty when modeling uncertainty situations and use these probabilistic beliefs in decision-making (Gilboa et al., 2008). Economics/business students demonstrate higher decision-making qualities in investment, where probabilistic reasoning is of necessity. Moreover, statistics courses in business/economics fields enable students to understand and measure probability (Chen et al., 2021).

Concerning the impact of economics education and financial literacy on students’ risk preferences, according to the value of z-statistics, which is equal to 4.08 and 3.26 (p < 0.01) and greater than 2.57, with a confidence interval of 99%, it can be confirmed that economics education and

<table>
<thead>
<tr>
<th>Variable</th>
<th>Z-Statistics</th>
<th>Significance Level</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ee → Fl → Probabilistic beliefs</td>
<td>2.06</td>
<td>0.03</td>
<td>Supported</td>
</tr>
<tr>
<td>Ee → Fl → Risk preferences</td>
<td>3.18</td>
<td>0.00</td>
<td>Supported</td>
</tr>
<tr>
<td>Ee → Fl → Social preferences</td>
<td>3.08</td>
<td>0.00</td>
<td>Supported</td>
</tr>
<tr>
<td>Ee → Fl → Entrepreneurship intention</td>
<td>3.93</td>
<td>0.00</td>
<td>Supported</td>
</tr>
</tbody>
</table>
financial literacy could directly, positively, and significantly affect students’ risk preferences. This result conforms to the findings of other similar studies (Bayrakdaroglu et al., 2019; Chen et al., 2021; Mayoral & Valladao, 2012; Mudzingiri, 2019; Muzakky & Soekarno, 2021). University students with low levels of financial literacy are more risk-taking and have high self-confidence compared to students with high financial literacy, and having financial literacy reduces mistakes in selecting risk-priority and time-priority students. Using financial literacy can provide a suitable amount of confidence and risk aversion among students (Mudzingiri, 2019). Students in economics/business fields demonstrate significant changes in risk preferences. Students who study economics perform more neutrally compared to those with the same main preferences but study a non-economics/business major.

Risk neutrality in small equity positions is regarded as an expected utility-maximizing behavior (Rabin, 2013). Inadequate financial literacy affects the lives of individuals, their families, friends, and business partners due to inappropriate financial decisions, and this has adverse effects on society and even causes a decrease in national wealth and, ultimately, a decline in the level of financial well-being in society (Aren & Zengin, 2016).

As regards the effect of economics education and financial literacy on students’ social preferences, according to the value of the z-statistics, which equals −4.09 and −3.16 (p < 0.01) and greater than 2.57, it can be mentioned (with a confidence interval of 99%) that economics education and financial literacy could have a direct, negative, and significant influence on students’ social preferences. The findings of other researchers (Bauman & Rose, 2011; Chen et al., 2021) corroborate our study’s findings. Students in economics/business majors do not show significant changes in social preferences; they seem mostly inclined to believe that others’ behavior is narcissistic (Chen et al., 2021). Economists are more generous than other experts, and economics students are more generous than other students and less likely to donate than other students. In addition, there is an indoctrination effect for non-majors and a selection impact for majors (Bauman & Rose, 2011).

Based on the results regarding the effect of economics education and financial literacy on students’ entrepreneurial intention, according to the value of z-statistics, which is equal to 4.89 and 4.09 (p < 0.01) and greater than 2.57, it can be confirmed that economics education and financial literacy could directly, positively, and significantly contribute to students’ entrepreneurial intentions (with a confidence interval of 99%). This is consistent with the results of the authors (Alshebami & Al Marri, 2022; De Jorge-Moreno et al., 2012; Hasan et al., 2020; Li & Qian, 2020). Using their multidisciplinary knowledge and expertise, higher education institutions create entrepreneurial behavior in cooperation with the government, industry, and society to deal with economic and social challenges (O’Brien & Cooney, 2019).

With regard to the moderating role of socio-economic status in the relationship between economic education and financial literacy, according to the value of the z-statistic (Z = 2.40, p < 0.05, and greater than 1.96), it can be concluded (with a confidence interval of 95%) that the socio-economic status of the family had a positive and significant moderating role in the relationship between economics education and financial literacy. This finding is in line with those of other studies performed by Cude (2010), Mullins (2007), Potrich et al. (2015), and Tang et al. (2015). Parents’ higher education leads to individuals’ higher financial literacy (Cude, 2010). Individuals with educated parents and good family economic status have higher financial literacy. These people have more income and better planning for the future. In fact, the socioeconomic status of the students’ families, including their parents’ education and employment status, impacts their financial literacy and leads to a better memory of the economy and more financial literacy.

### 6 Conclusion

Financial illiteracy increases the risk of making poor financial decisions and thus has a substantial effect on people, their friends, families, and business partners. Additionally, detrimental to society as a whole, this ignorance may eventually affect the wealth and financial stability of the country. A nation’s ability to accomplish its economic objectives depends on the cooperation of its citizens, and entrepreneurship is one way to promote this cooperation. University students are important economic activists, and raising their financial literacy can help them make better decisions and be more creative in their business ventures. Through the successful completion of economics courses, students can improve their performance and ability to make decisions. In addition to business acumen and employment prospects, entrepreneurship also has an impact on a nation’s ability to prosper economically, reduce poverty, and promote sustainable development. Thus, educational programs should aim to encourage an entrepreneurial culture and modify students’ attitudes toward entrepreneurship. It is recommended that decision-makers take into account the inclusion of economic and financial literacy courses in all disciplines of study when updating higher education curricula. Additionally, they should assess the efficacy and efficiency of these courses. Eventually,
achieving financial independence and earning targets may prompt people to think about becoming entrepreneurs.

This study set out to develop a model for determining the variables affecting entrepreneurial and investment decisions. Nonetheless, it is crucial to recognize the model’s limits. Hence, the following recommendations can be helpful to take into account for future research projects:

- Making use of a mixed method approach to offer a more thorough comprehension of the variables driving entrepreneurial and investment decisions.
- Examining how personality attributes affect judgment and entrepreneurial endeavors, as well as possible distinctions between people pursuing different academic specializations.
- Determining the best ways to improve university students’ financial literacy, with an emphasis on possible interventions and instructional initiatives.
- Investigating how financial literacy affects family well-being in Iranian homes and those of its neighbors in order to learn more about the wider societal ramifications.
- Researching with graduate and undergraduate students to get a wider variety of viewpoints and experiences.
- Incorporating multi-source data, such as qualitative and quantitative information, to enrich the depth and breadth of the research findings.

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Ethical approval: ethical approval from the participants has been taken at the time of filling up the questionnaires.

Informed consent: Informed consent has been obtained at the time of collecting data.

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## Appendix

### Questionnaire of Entrepreneurial intention

Indicate your level of agreement with the following statements from 1 (total disagreement) to 5 (total agreement)

- I'm ready to make anything to be an entrepreneur
- My professional goal is becoming an entrepreneur
- I will make every effort to start and run my own firm
- I'm determined to create a firm in the future
- I have very seriously thought about starting a firm
- I've got the firm intention to start a firm someday

### Questionnaire of Risk taking

Indicate your level of agreement with the following statements from 1 (total disagreement) to 5 (total agreement)

- I tend to make changes quickly rather than slowly and surely
- If there is a 50–50 chance of success, I will do it
- If I have some money, I prefer investing in pyramid companies to buying shares from the bank
- By accepting new projects, I feel satisfied

### Questionnaire of Social preferences

Indicate your level of agreement with the following statements from 1 (total disagreement) to 5 (total agreement)

- Betrayal of trust is a great sin
- Buying and selling votes in the presidential election is a clear fraud
- Buying and selling votes in the city council elections is an obvious fraud
- Personal use of public property is a disgrace
- Revenge should not be taken for pain or harm inflicted on oneself
- Evil should not be rendered for evil

Indicate your level of agreement with the following statements from 1 (too little) to 5 (too much)

- You are obliged to wear formal clothes
- It happens that you leave the house in casual clothes
- It happens that you appear in the community with informal clothes
- It happened that you play music (Iranian or non-Iranian) out loud in public places
- You try to do good in return for the good deed
- You try to give gifts in return for the ones you receive
- You try to thank others for their honest service
- If an individual asks you for help, you are ready to help him/her
- If a car has an accident on the road, you are ready to help its passengers
- If someone comes to you to find a job, you are ready to help him/her.
- How much do you try to behave according to the regulations in performing the assigned tasks?
- How much do you prefer acquaintances to strangers in performing your duties?
- In your workplace, how much attention do you pay to protecting public property?
- How important is conscientiousness in performing tasks?
- How much do you respect for work discipline?
- How much do you involve others in your decision-making process?
- How important are opinions of others in your decision-making?
- How fair are you in dealing with others?
- How much do you believe in equal distribution of resources and facilities among people in your group?
Questionnaire of Socioeconomic status of family

- How much do you think your family's income is enough for your life?
  Very insufficient □ Insufficient □ Somewhat sufficient □ Sufficient □ Very sufficient □
- If people are divided into 5 economic classes, in which class is your family?
  Very low □ Low □ Medium □ High □ Very high □
- What is the education level of your parents?
  Father: no diploma □ diploma □ post-diploma □ bachelor's degree □ master's degree □ doctorate □
  Mother: no diploma □ diploma □ post-diploma □ bachelor's degree □ master's degree □
- If you and your family own a house, how do you evaluate the price of your house?
  Very low □ Low □ Medium □ High □ Very high □
- If you and your family do not own a home, how do you know your financial ability to buy a home?
  Very low □ Low □ Medium □ High □ Very high □
Questionnaire of Probabilistic beliefs

- A fair coin is flipped five times, each time landing with tails up; 
  TTTTT What is the most likely outcome if a coin is flipped a sixth time?  
  (a) A Tail  
  (b) A Head  
  (c) A Tail and a Head are equally likely

- A fair coin is tossed five times. Which of the following sequence of outcomes is the most likely result of five flips of the fair coin? (H: Heads, T: Tails)  
  (a) HHHTT  
  (b) THHTH  
  (c) THTTT  
  (d) HTHTH  
  (e) All four sequences are equally likely.

- In an experiment, 12 fair coins are all tossed up in the air together and land on a table. If the experiment is repeated a lot of times which one of the following results will happen most often?  
  (a) 2 heads and 10 tails  
  (b) 5 heads and 7 tails  
  (c) 6 heads and 6 tails  
  (d) 12 heads and 0 tails  
  (e) All have the same chance

- A fair coin is tossed three times. The chance of getting heads at least twice when tossing the coin three times is  
  (a) smaller than  
  (b) equal to  
  (c) greater than

The chance of getting heads at least 200 times out of 300 times

- A spinner is half white and half grey, as shown in the figure. The spinner is spun 6 times. Every time the arrow points to either the white side of the spinner or the grey side

- If the experiment is repeated a lot of times which one of the following results will happen most often?  
  (a) 6 'white' and 0 'grey'  
  (b) 4 'white' and 2 'grey'  
  (c) 3 'white' and 3 'grey'  
  (d) 5 'white' and 1 'grey'  
  (e) All have the same chance

- In a container, there are 10 white and 10 black marbles. Without looking into the container, a child draws a marble out of the container. The child notes down the color of the marble and replaces it in the container. The child repeats this many times. Compare the chance of getting at least 7 white marbles in 10 draws with the chance of getting at least 70 white marbles in 100 draws. Please circle only one of the three statements. The chance of getting at least 7 white marbles in 10 draws is

Continued

(a) smaller than  
(b) equal to  
(c) greater than

The chance of getting at least 70 white marbles in 100 draws.

- In a small bag, there are 12 sweets, 4 strawberry sweets, and 8 chocolate sweets. Liz draws a sweet out of the bag without looking. Liz likes strawberries but she doesn't like the colour brown. What is most likely to draw out of the bag?  
  (a) A strawberry sweet  
  (b) A chocolate sweet  
  (c) Both are equally likely to be drawn

- Reza was drawn at random from a list of students. There were 30 students from the medical school and 70 students from the Faculty of Mathematics in the list. Here is a description of Reza. Reza likes helping people. When he was in high school, he volunteered for the Red Cross organization. He accomplished his studies with high performance. Which seems to you to be more likely?  
  (a) Steve is a student of the medical school  
  (b) Steve is a student of the Faculty of Mathematics  
  (c) It is equally likely for Steve to be a student either in the medical school or in the Faculty of Mathematics

- A reporter interviewed 4 football players and 8 singers. One of his interviewees is Ali. Ali earns a lot of money. He likes sports a lot. He exercises every day and he is well-built. He likes working as a team and he sticks to his daily schedule. He goes to bed early at night and he avoids smoking and drinking alcohol. Which of the following statements is the most likely?  
  (a) Ali is a football player  
  (b) Ali is a singer  
  (c) It is equally likely for Ali to be a football player or a singer

- Two groups of children play a game tossing a fair coin. The likelihood of getting 'Tail' when tossing the fair coin is 50%. The first group of children (group A) tosses the coin 50 times. The second group of children (group B) tosses the coin 150 times. Each time the children toss the coin, they note down the outcome. Which group of children is more likely to get 60% 'Tails' when tossing the coin?  
  (a) Group A  
  (b) Group B  
  (c) Neither: Both groups' results would be the same
Questionnaire of financial literacy

- Suppose you had $100 in a savings account and the interest rate was 2% per year with no further bank commission. After 2 years, how much do you think you would have in the account if you left the money to grow?
  (a) Less than 102 euro
  (b) Exactly 102 euro
  (c) More than 102 euro
  (d) Do not know

- Suppose you have $100 in a savings account and the interest rate is 1% per year with no further bank commission. Also suppose that inflation rate is 2%. If you withdraw all your money from the account in exactly a year, do you think you will be able to buy the same amount of goods you will be able to buy today with 100 euro?
  (a) Yes, I will be able to buy exactly the same amount
  (b) No, I will be able to buy less than the same amount
  (c) No, I will be able to buy more than the same amount
  (d) Do not know

- Which investment strategy, for a given amount of money, entails higher risk of losing your money?
  (a) To invest all your money in stocks in only one company.
  (b) To invest all your money in stocks from more than one company
  (c) The above two strategies have the same degree of risk
  (d) Do not know

- According to the current Iran pension system that would be applied when you will retire, your pension will be computed according to the following
  (a) The salary you are paid during the last few years of your working career
  (b) The contributions paid during your whole working career
  (c) None of the two
  (d) Do not know