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Statistical examination of entrepreneurship's effect on the higher education

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Abstract

Nowadays, the rate of labor supply and the demand rate for labor specifies the people's employment and unemployment status. In fact, a rise in labor supply and a reduction in labor demand constitutes an increase in unemployment that subsequently leads to reducing the employment rate and vice versa. The higher education job market, like any other market, is composed of supply and demand. The labor supply with higher education depends on the population, the number of university graduates, the number of students, the state of the higher education market in countries, which leads people to migrate or not migrate to other countries and consequently changes the rate of domestic labor supply. For this reason, a descriptive survey research method is employed to examine the correlation between graduates' unemployment rate and entrepreneurship development by the higher education system experts in society. Also, a structural equation model which specifies the relationship between the main variables and the second-order variables is considered. The statistical population of this study includes experts with master's and Ph.D. degrees. This information is gathered in 1400, and the number of people who were interviewed is about 100. Entrepreneurship development and graduates' unemployment constitute the main variables. The second-order variables include innovation, risk appetite, pioneering, aggressive competition, education, culture and society, economic, management, politic. In fact, the impact of entrepreneurship development on graduates' unemployment is measured. The results of structural equations proved that increasing entrepreneurship development by one unit leads to reducing the unemployment rate of graduates by 3.91%. Besides, the entrepreneurship development variable with 3.81% indicates the graduates' unemployment.

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1. Introduction

Nowadays, entrepreneurship is one of the key important factors in the economic development of a society (Acs *et al.*, 2004; Audretsch *et al.*, 2015; Backhaus *et al.*, 2005; Toma *et al.*, 2014). Overall, most countries in the world are involved in employment issues and try to tackle the problems in this regard. Nevertheless, the increase of problematic factors and their unknown features in third-world countries has considerably complicated this problem (Charlot *et al.*, 2011; Chukuezi, 2010; Irizarry, 1980). These days, managers generally seek to use scientific methods to identify and control problematic factors in the field of employment, finding opportunities from the challenges, and providing appropriate policies to expedite the development. From the point of researchers' view, the macro variable of human capital and appropriate exploitation of the workforce has been the most influential factor in the west's revolution and advancement among the physical, technological, and human capitals. It is also noteworthy that a growing body of literature has examined the advantages of entrepreneurship (Anis *et al.*, 2018; Moradi, 2019; Roundy *et al.*, 2020; Sadat Modarresi Saryazdi *et al.*, 2020; Tootian *et al.*, 2020). Concerning entrepreneurship, some factors have a fundamental impact on the unemployment rate of a country. In 2019, Ibrahim Jafari Sangari et al. have examined the factors such as geographic, demographic, institutional factors, and regional infrastructure influencing the region's entrepreneurship (Jafari Sangari *et al.*, 2019). Besides, Ali Kazemi et al. attempted to find the effect of the variables of export entrepreneurship and export market orientation on export performance (Kazemi *et al.*, 2019). Fatemeh Sadat Hosseini Astaraei et al. proposed a model with regard to the enterprise market abilities while their focus was on organizational innovation and entrepreneurship (Hosseini Astaraei *et al.*, 2019). In fact, employment and high education are considered significant factors due to their striking role in society's economic and social development (Ali *et al.*, 2018; Hussain, 2005; Jamir *et al.*, 2017; Teichler *et al.*, 1995). According to the previous studies, which bear a close resemblance to the subject of this paper, a full range of all variables affecting entrepreneurship formation has been proposed. Since organizational entrepreneurship is recognized as an effective strategy for the economic and social development of countries, entrepreneurship is known as discovering and exploiting opportunities to value in the field of economics, society, and culture, which is based on sustainable and comprehensive development. Thus, the development of entrepreneurship plays a prominent role in being active in the global markets, confronting competitors, developing justice, eradicating poverty, and solving the problems of society, government, and the public sector. Entrepreneurship development is a complicated, long-term, and comprehensive process that is strikingly effective in countries' economic growth and development. Today, entrepreneurship is considered the most strategic and important tool for the economic development of advanced societies, which increased around the world.

It is also noteworthy that inadequate use of human resources and the enormous growth of unemployment among young people will increase families' burden of support and livelihood and decline job

opportunities. Harbinson believes that human resources are the mainstay of nations' wealth (Harbison, 1973). In his opinion, capital and natural resources are subordinate to production; hence, humans seek to accumulate capital and exploit natural resources. They build the economic, political, social organization and step towards the development of their homeland. A country that fails to develop the skills and knowledge of its people and employs them effectively in the national economy is clearly unable to develop anything else. The unemployment of graduates in society is one of the considerable economic problem and social problems of the country. Overall, the employment or unemployment of a graduate has a significant impact on the employment or unemployment rate of the whole society since it leads to the employment or unemployment of a significant number of the normal workforce of the society. Therefore, this problem is worth being given special attention by the economic and social planners (Karbasi, 2016). Recognizing the causes of strength and weakness of graduates associated with employment leads to accepting the fact that flexibility, acceptance, motivation, and mental readiness are considered the necessary tools to tackle unemployment (Heydari Chianeh Rahim, 2015). According to the aforementioned problems and the employment concerns in Iran, such as lack of capacity in the public sector to attract specialized labor at the provincial level, the problems caused by the labor market regulations, the formation of long-term unemployment, and intensifying labor supply due to a large number of people in working ages, the need to study and plan in line with understanding the labor market situation of graduates of higher education is of great importance. The main reasons that led to the research on designing an entrepreneurship development model in the country's higher education system using the dynamic system are as follows:

- The labor market is one of the four most important markets of the economy, which is of special importance in terms of its association with human resources (Feyzpour, 2014).
- Human resources in the countries, including decision-makers and legislators at the macro level, managers and employees at the micro-level, have always been considered as the most central factor of growth and development, hence planning and providing a suitable situation to exploit the human resources completely and appropriately is the key concern of the most countries.

Recently, the developments in human resources and technology have caused doubt on this hypothesis. In this regard, the employment and unemployment issues due to their economic and social effects and consequences are among the issues that must receive the attention of socio-economic planners and policymakers (Hosseini, 2013). On the other hand, in the current situation, one of the fundamental issues in the two sectors of economics and higher education is the employment problem of university graduates. Also, the education of each student leads to using human and financial resources and spending time. In addition, the scholars spend the best days of their life on acquiring knowledge and incurring enormous costs for themselves and their families in a higher education center. More importantly, society, the family, and the

graduate expect a specific outcome from this process. Society expects each educated youth to provide effective service for their homeland after graduation. Broadly speaking, the people expect them to repay all the huge investment spent for their graduation. Besides, the family expects its children not only to provide a high-quality life for themselves but also to support their family financially, physically, and emotionally if necessary. It is noteworthy that the graduates seek to gain the necessary qualification and apply for an appropriate job according to their field. They are pleased to participate in activities related to the development and progress of their country. Finally, they hope to encounter relative satisfaction in terms of facilities, personal and social activities, and economic conditions. One of the significant factors in satisfying each of these demands depends on the graduate's effort to complete his education at the proper time according to a coherent and precise program. Firstly, he must study in the field required by society. Secondly, he needs to become competent enough in this field and do his best in his work. For these reasons, the curriculum is part of the country's development. In addition to the increase in the unemployment rate of graduates in the country, some provinces have also seen a rapid rise in the unemployment rate. Currently, Mazandaran province in Iran is among the most crowded provinces due to its weather conditions, fertility, etc. Clearly, more population constitutes more unemployment to society.

According to the aforementioned explanations, there is a strong and undeniable correlation between the unemployment rate and entrepreneurship development by the higher education system experts in society. Thus the analysis and study in this regard are of great importance, and there are several approaches for that such as fuzzy Delphi (Ghodsalavi *et al.*, 2019; Soleymani *et al.*, 2021), applied research method (Hindle, 2005; Kassim *et al.*, 2020; Rao, 1964), the best-worst method (Mosayebi *et al.*, 2020), descriptive-survey research method (Tih *et al.*, 2019), and etc. For instance, In 2017, Samadi Miarkolaei Hamzeh et al. attempted to identify and rank the influential factors on the organizational entrepreneurship process in Mazandaran fishery and marine organizations. They employed a descriptive survey method to collect data and used applied research for research purposes. In addition, they considered the fuzzy Delphi method and fuzzy AHP for verification and ranking of effective indices on organizational entrepreneurship. Finally, it was found that those influential factors are as follows: Behavioral factors, structural factors, and environmental factors (SAMADI *et al.*, 2017). In 2020, Esmail Kassim and Alaa El Ukosh investigated the entrepreneurship dimensions, including a degree of risk, entrepreneurial culture, creativity, and responsibility in technical education (Kassim *et al.*, 2020). They also conducted an applied study consisting of trainer, trainee, and training tools on graduates of the University College of Applied Sciences in Gaza. The questionnaire in their study was employed as a data collection tool, and a random sample method was also considered. Through the use of the applied research, they were able to indicate that entrepreneurship dimensions positively affect dimensions of Technical Education in the University College of Applied Sciences.

A more detailed look at the literature (Béchard *et al.*, 2005; Hoppe *et al.*, 2017; Kirby *et al.*, 2011; Mukesh *et al.*, 2018; Tomy *et al.*, 2020; Varamäki *et al.*, 2015) reveals a number of gaps and shortcomings. Hence, no study to our knowledge employed a descriptive survey research method to examine the correlation between graduates' unemployment rate and entrepreneurship development by the higher education system experts in society. In order to conduct the analysis considered in this paper, a structural equation model which specifies the relationship between the main variables and the second-order variables is employed. This model is useful when it is not possible to specify this relationship and it is analyzed through Amos software. The statistical population of this study includes experts with master's and Ph.D. degrees. This information is gathered in 1400, and the number of people who were interviewed is about 100. The main variables include entrepreneurship development and the graduates' unemployment while the second-order variables consist of innovation, risk appetite, pioneering, aggressive competition, education, culture and society, economic, management, politic. In contrast to the previous studies which mainly examined the impact of entrepreneurship development on graduates' unemployment, the factor load is measured in this research. In other words, the amount of the main variables' effect on the sub-variables is examined here and this analysis is of great importance in terms of novelty, authenticity, and practicality. The major aims of this study are summarized as follows:

- Specifying the effect of entrepreneurship development on the educates unemployment.
- Specifying the effect of entrepreneurship development on its sub-components.
- Specifying the effect of educates unemployment on its sub-components.

The rest of the paper is organized as follows: the second section briefly gives the information regarding the methodology considered in this paper. The proposed model and the parameters of employment and unemployment are outlined in Section 3. Finally, the main conclusions obtained from this study are presented in Section 4.

2. Methodology and problem definition

In fact, the barriers and challenges of entrepreneurship development in organizations are based on three items which are as follows: anti-motivational factors, legal barriers and business environment, and the nature of the organizational structure.

A) Anti-motivational factors in the organizational entrepreneurship

1. High financial risk (fear of losing personal capital)

2. Access to financial resources for investment (fear of not being able to provide sufficient financial resources to start up a business)

3. Administrative barriers (concern regarding the impossibility of meeting legal requirements)

4. Costs and social risks (concern regarding possible lack of social security)

5. Corruption

6. Lack of skills (fear of not having adequate and suitable skills and experience)

B) Legal barriers to entrepreneurship development in the fields of banking regulations, tax laws, labor law, export, and import, intellectual property, and patents

C) Evaluating the business environment based on selected entrepreneurs

Examining the barriers and problems of organizational entrepreneurship is not adequate without investigating and recognizing the business environment. In accordance with the selected entrepreneurs' point of view, the shortcomings of the business environment for new and growing companies are prioritized below in order of importance:

1. Lack of commercial, specialized, and professional infrastructures needed by new and growing companies

2. Lack of social and cultural norms support from entrepreneurship.

3. Lack of suitable physical infrastructure for new and growing companies

4. Lack of sufficient financial support for new and growing companies

Some of the most important aspects of entrepreneurial barriers from an organizational perspective are as follows:

1. The essence of large organizations: large companies have problems when they decide to conduct some entrepreneurial activities. These problems are related to their specific essence.

- The first problem is that these big companies require managers to create a certain structure in line with controlling them.
- When these companies grow larger, the need for more managers becomes an external problem, and the managerial ranks escalate. Increasing managerial ranks means increasing the vertical distance between the CEO and lower levels of employees.
- The third problem in large organizations is the need for control. As a company grows, the need for control becomes more significant. As a result, the company's management is forced to create consistent and quantifiable performance standards.
- The fourth problem is related to the company's culture. The company culture has an incentive system that supports conservatism in decision-making. The principles of guidance in the traditional culture of companies are based on following the company's structure, avoiding mistakes or avoiding failure, avoiding initiative and waiting to receive orders, preserving originality, and protecting the reputation.

2. The need for short-term profits: The companies aim to achieve short-term profits, which is the criterion of success in organizations. Therefore, the managers constantly try to adopt strategies based on taking short-term actions.

3. Lack of entrepreneurial talent: A small number of real entrepreneurs exist in large organizations. In the beginning, they are not attracted to large organizations and prefer an independent entrepreneurial life to a more secure life in the company.

4. The wrong policies to reward: Most organizations adopt different policies to reward creative employees. The companies use reward schemes for different employee levels instead of material rewards and intangible rewards in traditional organizations and refuse to encourage the organizational entrepreneurs.

In order to specify the causes of graduates unemployment in Iran, the following factors can be mentioned:

1. The rapid development of higher education in the 60s and 70s with respect to its quality.

2. Ineffectiveness of the modern sector in the country's economy and the inability to attract high graduates.

3. The desire of universities and higher education institutions to produce products for the modern sector.

4. Lack of a logical relationship between the university curricula and the labor market needs.

5. Lack of adaptation of the curriculum in associate's courses and vocational training courses to the needs of the labor market, which leads to the growing demand of high school graduates to continue their education in universities

6. The importance of a university degree as one of the basic qualifications to enter the modern sector.

7. The demand for the educated workforce with high competence for the low class and lower-paid jobs due to the long waiting time to find a job. This type of unemployment is different from the unemployment of high graduates since it creates hidden unemployment for high graduates. These factors indicate that educational fields are not enough to find a suitable job in Iran.

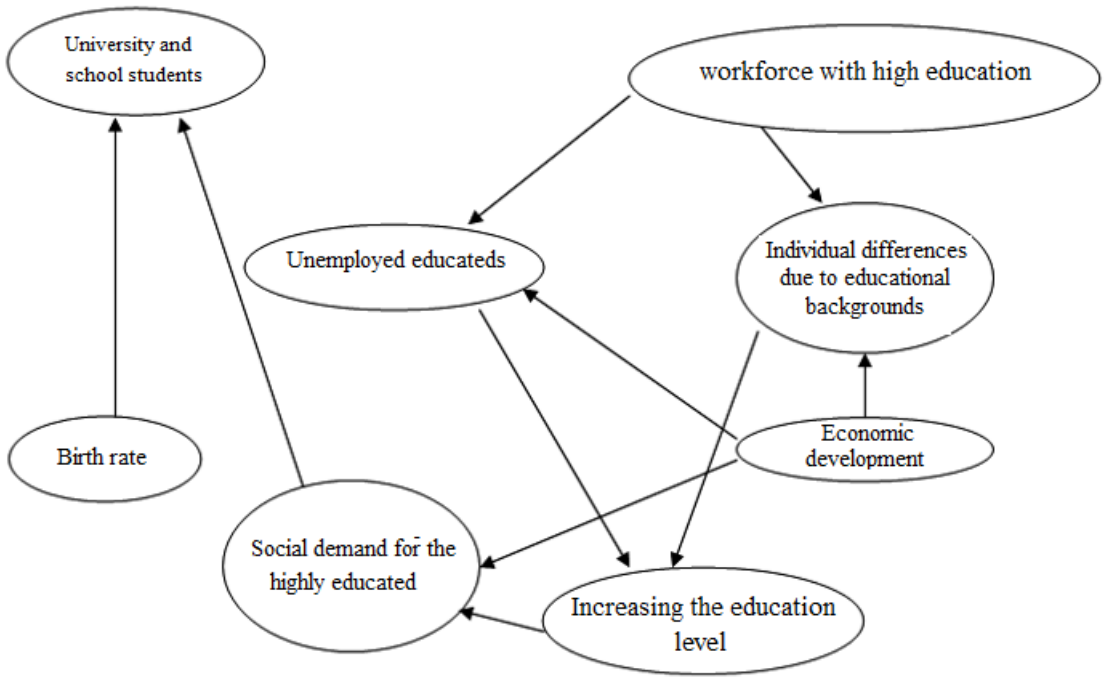

Figure 1. Causes of unemployment of high graduates in Iran (Sohrabi, 2011)

The factors which are significant in creating unemployment of high graduates in Iran are outlined in Figure 1. According to Figure 1 and the aforementioned explanations, statistical analysis is the best idea to clarify the strong correlation between the unemployment rate and entrepreneurship development by the higher education system experts. Therefore, a structural equation model is considered to specify the relationship between the main variables and the second-order variables. The aim of this model is to examine the amount of the main variables' effect (the observable variables' effect) on the sub-variables (the latent variables). As a result, the amount of factor load which is the effect of the observable variables on the latent variables is examined in this case study. Figure 2 illustrates the steps that must be conducted respectively for this analysis.

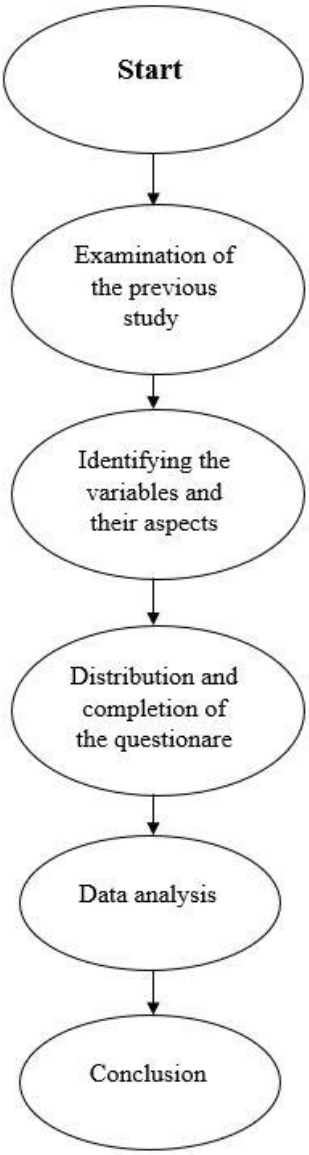

Figure 2. The steps of the analysis

The present study is applied research in terms of purpose, and it is a descriptive survey in terms of method. Also, this study is of correlation type in terms of the

relationship between the variables and is cross-sectional in terms of time. The statistical population of the study is constituted of all experts in higher education whose degrees are master and Ph.D. This information was gathered in 1400, and the number of people is about 100. In order to eliminate the effects of a missing and incomplete questionnaire or unanswered items concerning the research results, the statistical sample of the present study increased to 70 people and 58 answers and was approved and selected by the available sampling method. The main tools for this research are questionnaires of graduate unemployment and entrepreneurship development. According to the research hypotheses and the sample group, Spss-24 and AMOS18 software are employed to analyze the data at two levels of descriptive and inferential statistics. Descriptive statistics such as mean value calculation, standard deviation, etc., are considered to describe the data. Also, the Pearson correlation test and structural equations model, a combination of path models (structural relations) and confirmatory factor (measurement relations), are considered for statistical analysis.

3. Results and Discussion

The main results obtained through the statistical analysis and information gathered from the desired population are given in this section. Table 1 gives a brief overview regarding the characteristics distribution of this demographic of the sample under study.

Table 1. Characteristics distribution of this demographic of the sample under study

Variables	Education level		Work experience (years)					Rang of age (years)			
Items	Master	Ph.D.	5 <	5-10	11-15	15 >	25 <	26-30	31-35	36-40	40 >
Woman	9	13	11	7	2	1	4	4	3	4	6
Man	15	21	26	9	2	0	8	9	5	3	12
Total	24	34	37	16	4	1	12	13	8	7	18

At first, it is necessary to examine the assumption that the data are normal for the inferential findings. For this purpose, it is required to assure that the data has no kurtosis and skewness. The outputs related to this assumption are examined in this section. Since the reported kurtosis and skewness values are less than the critical value proposed by the software, it can be stated that the default of the data is normal. Table 2 highlights the correlation values between the research variables. According to the values shown in this table, all the relations are less than 0.05, and it can be concluded that the relationships between these variables are meaningful.

Table 2. Internal correlation between the variables of the study

Number	**Variables**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	Innovation	-							
2	Risk appetite	0.751	-						
3	Pioneering	0.292	0.302	-					
4	Aggressive competition	0.391	0.234	0.029	-				
5	Educational	-0.694	-0.644	-0.182	-0.335	-			
6	Cultural and social	-0.429	-0.321	-0.210	-0.120	0.476	-		
7	Economical	-0.402	-0.345	-0.091	-0.213	0.370	0.458	-	
8	Managerial	-0.552	-0.538	-0.395	-0.248	0.601	0.173	0.213	-
9	Political	-0.684	-0.600	-0.394	-0.211	0.640	0.387	0.342	0.717

In the next step, the models of factor analysis are examined and prioritized. Then, the model must be fitted in order to confirm or reject the research hypothesis saying that "there is a meaningful and considerable relationship between graduate and entrepreneurship development of unemployment higher education experts." Table 3 gives the overall information with regard to the graduate unemployment model and entrepreneurship development, and the related details of the model (values of the parameters and the significance of their difference with zero, especially for structural coefficients) are presented.

Table 3. Fitting indexes of graduate unemployment model and entrepreneurship development

Fit indices		Value	Criterion	Interpretation
Absolute	Statistical test (χ^2) and degree of freedom (df)	(24) 24.398	Higher df with less χ^2	Desired fit
	p-value (significance level)	0.439	More than 0.05	Desired fit
	Goodness of Fit Index (GFI.)	0.921	More than 0.90	Desired fit
	Adjusted Goodness of Fit Index (AGFI.)	0.902	More than 0.90	Desired fit
	The second root of the mean squares of the residual error (RMR.)	0.024	Less than the absolute value of four	Desired fit
Adaptive	Tucker-Lewis index (TLI)	0.997	More than 0.90	Desired fit
	Bentler-Bonett Normed Fit Index (NFI)	0.902	More than 0.90	Desired fit
	Comparative Fit Index (CFI)	0.998	More than 0.90	Desired fit
Parsimony	Root Mean Square Error of Approximation (RMSEA.)	0.017	Less than 0.05	Desired fit
	Parsimony Normed Fit Index (PNFI.)	0.602	More than 0.5	Desired fit

In order to examine the model's efficiency, the overall fit indices of the model are considered. With respect to the results presented in Table 3, the significance level of the model (0.439) is higher than the significance level of $\alpha = 0.05$. Hence, there is no considerable difference between the measured model and experimental data, and the fit model is suitable for the data. The result of dividing the test statistic by the degree of freedom is equal to 1.017 (less than three is desirable). Besides, the small values reported for RMR and RMSEA are equal to 0.024 and 0.017,

respectively, and generally confirmed the appropriateness of the model of graduate unemployment distribution and entrepreneurship development. The GFI, AGFI, TLI, NFI, and CFI indices are also more than 0.9 and close to one, and this is another benefit of the fit model. The PNFI index is also reported to be optimal, and all of them are considered a confirmation of the model presented in Figure 3. According to the values reported for the parameters and their significance with zero, especially for the impact factors or structural factors, it is necessary to mention more information regarding the values presented in Table 4. Overall, the details of the model are outlined in Figure 3.

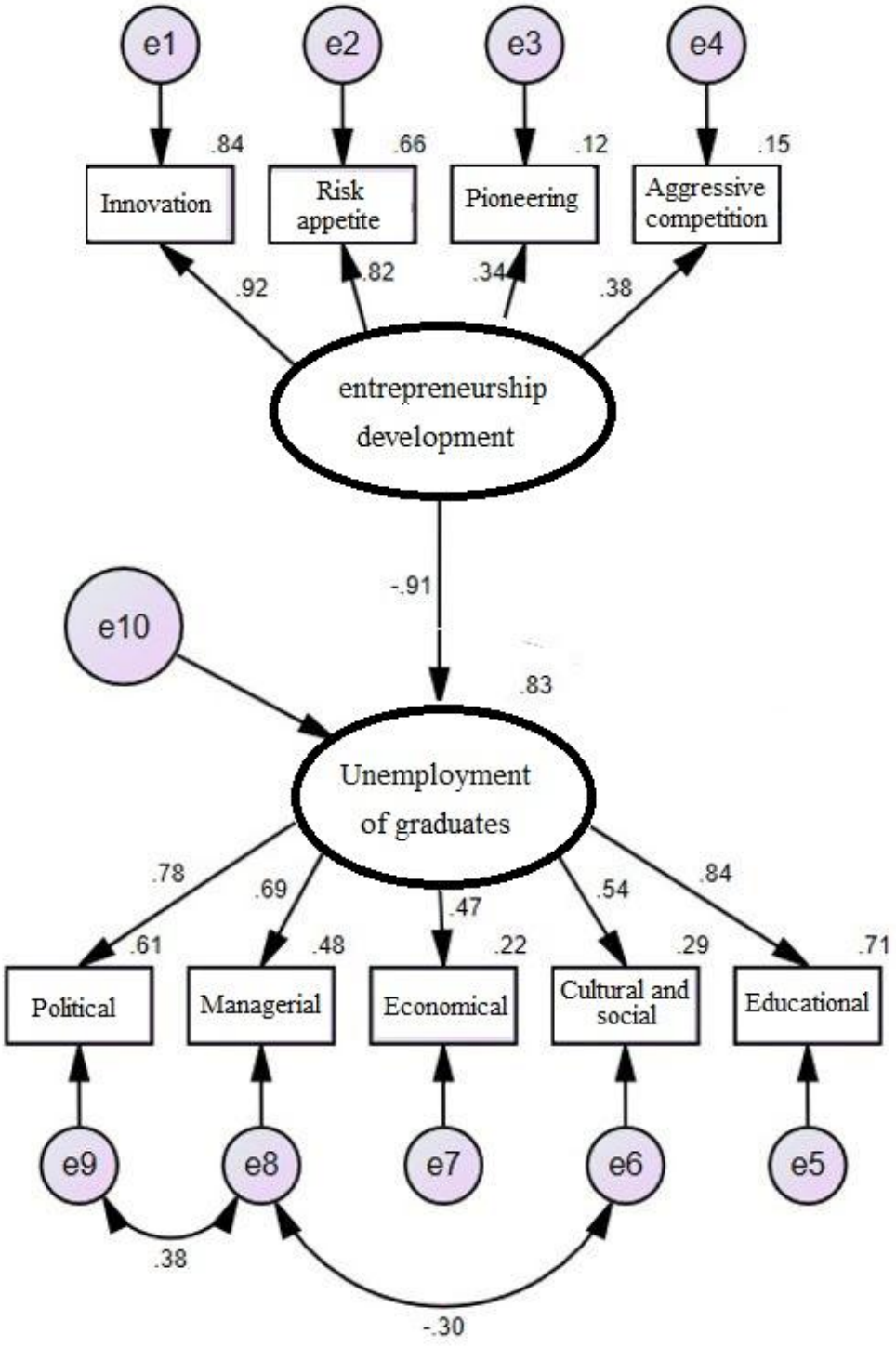

Figure 3. Graduate unemployment model and entrepreneurship development

Table 4 demonstrates the fitted effects for the model in the form of weight regression.

Table 4. Fitted values of graduate unemployment model parameters and entrepreneurship development ($P < 0.001^{***}$)

Numbers	Model paths			b	SE.	β	p-value	R^2
1	Entrepreneurship Development	<---	Unemployment of graduates	-1.198	0.170	-0.913	***	0.833
2	Entrepreneurship Development	<---	Innovation	1	-	0.917	-	0.841
3	Entrepreneurship Development	<---	Risk appetite	1.154	0.154	0.797	***	0.635
4	Entrepreneurship Development	<---	Pioneering	0.279	0.109	0.337	0.010	0.114
5	Unemployment of graduates	<---	Aggressive competition	0.411	0.139	0.383	0.003	0.147
6	Unemployment of graduates	<---	Educational	1	-	0.844	-	0.712
7	Unemployment of graduates	<---	Cultural and social	0.577	0.138	0.538	***	0.289
8	Unemployment of graduates	<---	Economical	0.474	0.133	0.464	***	0.215
9	Unemployment of graduates	<---	Managerial	0.625	0.113	0.689	***	0.475
10	Unemployment of graduates	<---	Political	0.943	0.141	0.783	***	0.613

In fact, the fitted values of the model parameters reported in Table 4 are related to the standard estimated value of the model parameters, which is clearly presented in Figure 3. Furthermore, concerning the results highlighted in Table 4, there is a significant level for regression coefficients which is very close to zero. Thus, the relationships between them are meaningful, and the hypotheses basing on a significant and negative relationship between unemployment of graduates and entrepreneurship development of experts in the higher education system are proved with 95% reliability. Besides, the unemployment rate of graduates will decline by 91.3%. Finally, the variance values presented in Table 4 indicate that the path of entrepreneurship development to graduate unemployment outlines 83.3% of the variance value of graduates' unemployment.

4. Conclusion

With respect to the studies conducted up to now and proposing a basic framework for a scheme of the employment community of higher education graduates, it can be concluded that the rate of student admission in all fields must be regulated and decreases or increases based on the work environment. It is necessary to create an educational proportion between the universities' curricula and the labor market, and they need to be reviewed at least once in a while. Hence, the major aim of this research is to examine the correlation between graduates' unemployment rate and entrepreneurship development by the higher education system experts in society. A structural equation model which specifies the relationship between the main variables and the second-order variables was also considered. The analysis in this paper was

conducted through Spss-24 and AMOS18 software. The statistical population of this study includes experts with master's and Ph.D. degrees. This information is gathered in 1400, and the number of people who were interviewed is about 100. The main variables consist of entrepreneurship development and the graduates' unemployment. Also, the second-order variables consist of innovation, risk appetite, pioneering, aggressive competition, education, culture and society, economic, management, politic. The amount of the main variables' effect on the sub-variables (factor load) is investigated. The main indices considered in this analysis are as follows: Df, significance level, GFI, AGFI, RMR, TLI, NFI, CFI, RMSEA, and PNFL. Finally, the variance values indicate that the path of entrepreneurship development to graduate unemployment outlines 83.3% of the variance value of graduates' unemployment. The results of structural equations imply the fact that increasing entrepreneurship development by one unit leads to reducing the unemployment rate of graduates by 3.91%. Besides, the entrepreneurship development variable with 3.81% indicates the graduates' unemployment. Accordingly, the causes of unemployment of higher education graduates can include the following items:

- Lack of proportion between the economic growth and employment capacity of the society with the growth of graduates.
- Lack of sufficient relationship between the education system and the employment system.
- Lack of skills required by the labor market among the society members.
- Increasing the participation rate in the workforce among the members of the society.
- The graduates' focus on the central environments.
- The lack of enthusiasm to find a job among the graduates.
- The lack of coordination and relationship between the educational institutions and the production centers.
- The lack of sufficient information with regard to the needs of the labor market.

Looking forward, further attempts could prove quite beneficial to the literature.

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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