Evaluation role of human capital in increasing enterprise's income by ensuring stability and security

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Abstract. In this paper considered possibilities of increasing income of business entities by ensuring their stability and security. Evaluated effect of changes in capital and labor force on the amount of output produced by small business entities by using developed production function. Also, estimated probability of increasing the enterprise's income by ensuring the stability and security of the business entity taking into account human capital.

1 Introduction

Entrepreneurship, especially innovative entrepreneurship is the basis for ensuring stability and security, as well as according to conclusions of scientists who have conducted research in this field, creativity is considered an unlimited source of innovation and important for long-term life of any entrepreneurial business [1-4]. Nowadays there are different approaches to the concept of entrepreneurship. We want to focus on entrepreneurship as a process of people working together with their passions, taking risks, creating businesses and designing ideas, visions and missions, using creative and innovative ideas to create value and wealth.

The processes that take place from establishment of entrepreneurship to its transformation into a large business is the research topic for scientists conducting scientific research in the field of entrepreneurship [5, 6]. In a free market economy, small business recognized as an important factor in providing employment, creating innovations and sustainable economic growth, therefore survival, success and stability of small business are the key problems that are waiting for their solution [7].

Determining the factors affecting activity of entrepreneurs and assessing their impact is very important in order to ensure safety and stability of business entities, as well as developing forecast values of main indicators of business activity serves to ensure their safety while reducing level of risk in their activities.

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2 Literature review

Small business is a source of entrepreneurship development and large business as well as a driving force in economic and industrial growth and development [8]. Therefore, small business known as the main source of income and employment, as well as key factors in poverty reduction [9] by contributing considerably to gross local product. But in fact, small business come across with various challenges that are within and outside of their potential, such as accounting skills, risk management, general management, professionalism, and green business [10-12]. For instance inadequacy, inexperience and lack of knowledge, poor administration and lack of control of financial processes including lack of current knowledge and information about accounting software are the key factors that negatively impact on stability and consequent sustainability of small business [13]. The perception of business environment and company operations may also be affected by education of an entrepreneur [14]. For instance substantiated university degree make a significant sense in business performance, sales or profitability as well as sustainability [15], where higher educated entrepreneurs can manage financial risks better [16, 17]. That is a graduate entrepreneur have an upper hand in finding different sources of capital for increasing the innovation of a small business [18].

Human capital or prior knowledge important in the field of entrepreneurship [19, 20] where human capital assists in the accumulation of new knowledge and the creation of advantages for new firms [21, 22]. Human capital is crucial source of entrepreneurial innovations and development [23-27].

3 Methodology

In order to conduct research methodology is a key factor. Therefore, we used several qualitative and quantitative research for receiving reliable results and conclusion. In developing production function model used secondary data that received from department of statistics in Kharezm region. However, for evaluating role of human capital in increasing the enterprise's income by ensuring the stability and security used primary data. In order to have a sufficient set of data for analysis created a special questionnaire dedicated to the analysis of issues of ensuring stability and safety of innovative development of business entities in Kharezm region. As well as evaluating role of human capital in development of small business and entrepreneurship. The questionnaire consisted of five sections and included a total of 74 questions. Using the selection method, taking into account characteristics of business entities such as territorial location, organizational legal form, types of activity a total of 300 questionnaires were distributed and 251 of them were completely filled in according to established procedure and were found to be suitable for use.

4 Analysis and Results

The most important factors in organization of production process are adequacy of labour and capital, those are play a critical role in ensuring competitiveness and organization of production, increasing stability, ensuring safety. That is, the study of the dynamics over years serves to express effect of increase in labour force potential, investment, renewal of fixed assets, capacity of fund and changes in fund return.

Taking into account abovementioned, we found it permissible to evaluate role of production factors in the development of entrepreneurship, especially innovative entrepreneurship.

Aanalysis was carried out on the basis of data for 2010-2021 years at an example of Kharezm region, that is the object of research. The volume of production created by small business entities and investment transferred into fixed prices by taking 2010 years as a base and determined their real values.

According to the results of the regression analysis, we obtained a following Cobb-Douglas production function.

$$Y = 5.1 * 10^{-4} * L^{1.84} * K^{0.22}\,, \quad (1)$$

$$t = (-6.84)\ (9.13)\ (6.22) \quad R^2 = 0.98$$

All coefficients of the given model are adequate according to Student's criterion; their probability level is almost zero. According to the results of research, labour force elasticity coefficient is 1,84, where capital elasticity is equal to 0,22. As a result, the sum of their elasticity coefficients is 2.06, where increasing the factors at the same time by a percent serves to increase the amount of products produced by small business entities more than 2 percent.

Unexpected changes and fluctuations in the economy cause instability and increase the level of risk for business entities. The results of economic fluctuations are expressed in changes in the level of employment and volume of investment. Therefore, taking into account the results of changes in previous years, we decided to develop scenarios of the amount of products produced by small business entities in Kharezm region that is suitable for different situations.

For the scenario, used Cobb-Douglas production function and maximal, minimal, average values of indicators growth rate, as well as evaluated effects of economic fluctuations. As a result of looking through at options suitable for different situations, the following results were obtained (Table 1).

In the first scenario considered maximum growth rate of employed and investment in small business simultaneously during 2010-2021.

Table 1. Scenarios for different situations of product volume developed by small business entities

Scenarios	Growth rate of products produced by small business (percentage)	Growth rate of employee in small business (percent)	Growth rate of investments in fixed capital in small business (percent)
Scenario 1 (maximum growth rate)	**24.9**	7.4	50.7
Scenario 2 (average growth rate)	**7.5**	1.6	20.2
Scenario 3 (minimum growth rate)	**-11.9**	-4.9	-12.8
Scenario 4	**18.1**	3.7	50.7
Scenario 5	**-5.8**	-4.9	14.5

If condition in first scenario is met, it is possible to increase amount of products produced by small business by 24,9 percent. In second scenario, taken average growth rate of 2010-2021 years. In this case it is possible to increase the amount of product by 7,5 percent. In third scenario chosen minimal growth rate of both factors simultaneously, where the volume of production decreased up to 11,9 percent.

In fourth scenario looked through the year, when the maximum growth rate of investments ensured and growth rate of employment at the same year, which is 3,7 percent. Such situation it is possible to increase amount of products produced by small business up to 18,1 percent.

Growth rate of employment in small business hit its lowest point in 2020, decreasing by 4,9 percent, which was the consequence of economic slowdown caused by COVID-19. At

that year because of high growth rate in value of investments, government could slow down the fall in amount of product produced by small business. According to scenario product decreased 5,8 percent in 2020.

However, the measures taken by the government to support small businesses and reduce the negative impact of COVID-19 on economy, maintained the positive trend in growth of production volume. If there was no support from the government, the amount of products produced by small business would have decreased to 5,8 percent.

Carrying out of this research, a number of socio-economic indicators have been determined, which influence stability and safety of activities of small business entities in the region.

Collected primary data on the basis of a sociological questionnaire and created necessary database, because of secondary data obtained from Statistical Committee of the Republic of Uzbekistan and regional department did not allow to assess the impact of these indicators. On the basis of created database, carried out analysis on the issues of ensuring stability and safety of business entities in innovative development of Kharezm region, factors affecting it, assessment of their influence based on expert method. As it known conducting analyzes by using modern methods and programs, serves to substantiate scientificity of results.

Taking into account abovementioned, used logit and probit models for the analysis, those used for modeling qualitative indicators. We evaluated factors based on quantitative indicators of their impact on ensuring stability and safety of innovative development of business entities. Eviews software used to perform this analysis and results presented in Table 2.

Table 2. The results of the analysis based on the Eviews

Dependent Variable: Y1				
Method: ML – Binary Logit (Quadratic hill climbing)				
Date: 06/21/21 Time: 18:01				
Sample: 1 253				
Included observations: 253				
Convergence achieved after 3 iterations				
Covariance matrix computed using second derivatives				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.903550	0.417574	-2.163807	0.0305
YEARS_ACTIVE	0.066626	0.028933	2.302777	0.0213
HIGH	1.046847	0.457752	2.286932	0.0222
SECONDARY_SPECIAL	0.814024	0.475023	1.713651	0.0866
SECONDARY	1.150637	0.536856	2.143288	0.0321
McFadden R-squared	0.039002	Mean dependent var		0.553360
S.D. dependent var	0.498130	S.E. of regression		0.489028
Akaike info criterion	1.360786	Sum squared resid		59.30871
Schwarz criterion	1.430616	Log likelihood		-167.1394
Hannan-Quinn criter.	1.388881	Deviance		334.2788
Restr. Deviance	347.8456	Restr. Log likelihood		-173.9228
LR statistic	13.56677	Avg. Log likelihood		-0.660630
Prob(LR statistic)	0.008814			
Obs with Dep=0	113	Total obs		253
Obs with Dep=1	140			

Results of various tests and criteria received by conducting analysis using Eviews show adequacy of identified coefficients and substantiated possibility of using them for analysis and drawing conclusions. But z-statistic of coefficient representing the effect of having only secondary education is 1,71, where its probability is 0.9.

However, the coefficient of determination is quite low, which is typical for models of this type. "Unfortunately, low R2 values in logistic regression are the norm and this presents a problem when reporting their values to an audience accustomed to seeing linear regression values… Thus we do not recommend routine publishing of R2 values from fitted logistic regression models" [28-34]. The developed equation can be expressed in the following forms:

$$P = \frac{e^{-0.904+0.066*X_1+1.047*X_2+0.814*X_3+1.151*X_4}}{1+e^{-0.904+0.066*X_1+1.047*X_2+0.814*X_3+1.151*X_4}} \quad (2)$$

or

$$\ln\left(\frac{P}{1-P}\right) = -0.904 + 0.066*X_1 + 1.047*X_2 + 0.814*X_3 + 1.151*X_4 \quad (3)$$

Here: P- probability of increasing the enterprise's income by ensuring the stability and security of the business entity; X_1- operating period of enterprise (in years); X_2 – head of enterprise has a higher education; X3 – head of enterprise has a secondary specialized education; X3 – head of enterprise has a secondary education.

It can be seen from the developed equations (2) and (3) there is a positive relationship between indicators such as operating period of enterprise, level of education of head of enterprise and probability of increasing income of enterprise by ensuring stability and security of the business entity. Therefore, it can be concluded increase in operating period of enterprise serves to ensure stability and security of the business entity and to increase income of enterprise.

In order to ensure stability and security of business entity and to increase income of enterprise, we will look at minimum required operating period of enterprise based on given model. That is, required operating period of enterprise was determined using law of diminishing marginal effect on stability and safety of enterprise.

On the basis of given equations, as operating period of enterprise increases, it can be seen that its stability and safety increases and tendency of its marginal impact on its income decreases. According to the results of questionnaire, the average operating period of enterprise is 5,6 years.

Based on the results of analysis, if the head of enterprise has a high education and enterprise has been operating for five years, then the probability of increasing enterprise's income by ensuring stability and security of business entity is 51 percent.

In this case, increasing operating period of enterprise by a year increases the probability by 1,7 percent. If enterprise has been operating for 30 years, probability will become 84,7 percent, where marginal effect will be equal 0,9 percent (table 3).

Table 3. Estimating effect of operating period of enterprise to probability of increasing the enterprise's income by ensuring stability and security of business entity (head of the enterprise has a higher education).

	Coefficients	**Options**							
Operating period	0.066626	5	6	10	11	20	21	29	30
High	1.046847	1	1	1	1	1	1	1	1
C	-1.333835	1	1	1	1	1	1	1	1
	Y*=ln(p/(1-p))	0.046	0.113	0.379	0.446	1.046	1.112	1.645	1.712

Probability	p=exp(y*)/ (exp(y*)+1)	0.512	0.528	0.594	0.610	0.740	0.753	0.838	0.847
Marginal effect			0.017		0.016		0.013		0.009

The fact that having head of enterprise secondary specialized education decreases effect of operating period of enterprise to probability of increasing enterprise's income by ensuring stability and security of business entity. In particular, in contrast to abovementioned results, determined that probability is 45,3 percent when operating period of enterprise is 5 years and becomes 81,4 percent if operating period of enterprise increases up to 30 years. However, the difference in marginal effect reduction is not significant, that is 0,1 percent table 4.

Table 4. Estimating effect of operating period of enterprise to probability of increasing enterprise's income by ensuring stability and security of business entity (head of enterprise has a secondary specialized education).

	Coefficients	**Options**							
Operating period	0.066626	5	6	10	11	20	21	29	30
High	0.814024	1	1	1	1	1	1	1	1
C	-1.333835	1	1	1	1	1	1	1	1
	Y*=ln(p/(1-p))	-0.187	-0.120	0.146	0.213	0.813	0.879	1.412	1.479
Probability	p=exp(y*)/ (exp(y*)+1)	0.453	0.470	0.537	0.553	0.693	0.707	0.804	0.814
Marginal effect			0.017		0.017		0.014		0.010

In contrast to results of the analysis presented above, having the head of enterprise secondary education increases effect of operating period of enterprise to probability of increasing enterprise's income by ensuring the stability and security of business entity. In particular, if the head of enterprise has a secondary education and enterprise has been operating for 5 years then probability of having ensured stability and security, as well as high income will be 53,7 percent, which is that previous results. Increasing operating period of enterprise up to 30 years increases the probability level to 86,0 percent, and also reduces the marginal effect from 1,7 percent to 0,8 percent table 5.

Table 5. Estimating effect of operating period of enterprise to probability of increasing enterprise's income by ensuring stability and security of business entity (head of enterprise has a secondary education).

	Coefficients	**Options**							
Operating period	0.066626	5	6	10	11	20	21	29	30
High	1.150637	1	1	1	1	1	1	1	1
C	-1.333835	1	1	1	1	1	1	1	1
	Y*=ln(p/(1-p))	0.150	0.217	0.483	0.550	1.149	1.216	1.749	1.816
Probability	p=exp(y*)/ (exp(y*)+1)	0.537	0.554	0.618	0.634	0.759	0.771	0.852	0.860
Marginal effect			0.017		0.016		0.012		0.008

In this case probability of increasing enterprise's income by ensuring stability and security of business entity has the highest when head of enterprise has a secondary education. Results of the model shows that academic degree of head of enterprise has no effect on probability of increasing the enterprise's income by ensuring stability and security of the business entity. Contrarily having lower academic degree support higher probability, which does not afford economic theory. As well as that considered as a sign that the laws of the market do not work properly.

5 Discussion

According to the results of the researches, most of authors looked at development trends of innovative entrepreneurship [1], role innovation process in specific filed of entrepreneurship [3, 4], role small business in providing employment, creating innovations, economic growth [7], role of inexperience and lack of knowledge in administration, financial sustainability [13], role human capital or prior knowledge in the field of entrepreneurship [19, 20]. In contrast to them, in this research the problems mentioned above considered in a complex interdependence. Also, special attention was paid to the use of qualitative and quantitative methods in a mutually acceptable ratio in implementation of research. That is, the role of human capital in ensuring the stability and security of business entities has been considered by modeling the results of sociological research.

6 Conclusion

As a results of research we could conclude that innovative entrepreneurship is the basis for ensuring stability and security, as well as in development of small business and private entrepreneurship. Moreover, the measures taken by government to support small businesses and reduce the negative impact of economic fluctuations, such as COVID-19 on economy, maintained the positive trend in growth of production volume.

Collected primary data on the basis of a sociological questionnaire substantiated human capital is the source in increasing enterprise's income by ensuring stability and security. For instance:

- if the head of enterprise has a high education and operating period increased from five years to thirty years, then the probability of increasing enterprise's income by ensuring stability and security of business entity from 51 percent to 84,7 percent.
- if the head of enterprise has enterprise secondary specialized education, then income by ensuring stability and security of business entity could be increased from 45,3 percent to 81,4 percent depending on operating period.
- if the head of enterprise has a secondary education then probability of having ensured stability and security could be increased from 53,7 percent to 86,0 percent, as operating period up to 30 years.

It can be concluded that in insuring stability and security of business entity human capital is the key factors, where his knowledge and skills have a positive effect on increasing income. So the government should take on special support programs which directed to increase knowledge of managers and theirs working period at the same entreprise.

References

1. J. Bessant, and J. Tidd. *Innovation and entrepreneurship*. John Wiley & Sons. (2007).

2. A. M. Ajagbe, and K. Ismail. *Factors Influencing Venture Capital Assessment of High Growth Companies in Malaysia*. International Journal of Entrepreneurship and Small Business, **21(4),** 457-494 (2014).
3. D. Bekjanov, and B. Matyusupov. *Influence of innovative processes in the competitiveness of tourist destination*. Innovation and entrepreneurial opportunities in community tourism, 243-263 (2020). doi:10.4018/978-1-7998-4855-4.ch014
4. V. F. Islamutdinov, and A. N. Ustyuzhantseva. The model to assess economic security of fuel and energy complex enterprises of the northern resource-producing region taking into account the behavioral aspect, International Journal of Mechanical Engineering and Technology, **9(8),** 1161-1171 (2018).
5. O. O. Ogunnaike, and M. E. Ogbari. Impact of Entrepreneurship Risk Taking Decision Proces on Investment Objectives, International Journal of Investment and Finance, **1(1),** 201-215 (2008).
6. K. A. Barmuta, I. Y. Andryushchenko, A. A. Tagibova, G. V. Meshkova, and A. O. Zekiy. Problems of business processes transformation in the context of building digital economy, Entrepreneurship and Sustainability Issues, **8(1),** 945-959 (2020). doi:10.9770/jesi.2020.8.1(63)
7. A. M. Ajagbe, T. D. Isiavwe, E. I. M. Ogbari, and B. A. Sholanke, Financing Early Staged Technology Based Firms in Malaysia, Research Journal of Finance and Accounting, **6(4),** 210-221 (2015).
8. M. Donjeta & G. Prespp. T*he Role of SMEs on the Economic Development: Kosova's Case*. SSRN Electronic Journal, (2016). 10.2139/ssrn.2820980.
9. T. Beck, K. Asli Demirguc, and R. Levine. *SMEs Growth, and Poverty: Cross-Country Evidence*. World Bank. (2005).
10. E.I. Idemobi, The problem of sustaining the growth of Small Medium Enterprises in a typical sub-Saharan African context, African Journal of Social Sciences, **2(1)**, 15-24. (2012)
11. O. Fatoki. The causes of the failure of new Small and Medium Enterprises in South Africa, Mediterranean Journal of Social Sciences, **5(20),** 922-927 (2014).
12. E.V. Krotkova, and K.S. Mullakhmetov. State control over small business development: Approaches to the organization and problems (experience of the Republic of Tatarstan, the Russian Federation). Academy of Strategic Management Journal, **15**(SpecialIssue1), 8-14 (2016).
13. M. Nonhlanhla, and N. Musawenkosi. Factors affecting financial stability of small and medium enterprises: A case study of emerging markets, Risk Governance and Control: Financial Markets & Institutions, **7** (2017). doi: 10.22495/rgcv7i1art1.
14. Z. Virglerova, K. Dobes, J. Kramolis, A. Kotaskova. The Influence of SME Owners‘s Education on Their Perception of Business Environment in Czech Republic, Economics and Sociology, **10(3),** 321-332 (2017). doi:10.14254/2071-789X.2017/10-3/22
15. J. Van der Sluis, and M. Van Praag, Education and Entrepreneurship Selection and Performance: A Review of the Empirical Literature, Journal of Economic Surveys, **22(5),** 795-841 (2008).
16. W. Wang. How the small and medium-sized enterprises’ owners’ credit features affect the enterprises’ credit default behaviour? Journal of Business Management and Economics, **3(2),** 090-095 (2012).

17. L.B. Trofimova, P.S. Probin, O.G. Grigorieva, V.V. Smirnova. Institutional analysis of the regulatory and legal framework for financial reporting control in Russia. European Research Studies Journal, **21**(Special Issue 3), 130-141 (2018). doi:10.35808/ersj/1367
18. M. Kato, H. Okamuro, and Y. Honjo. Does Founder Human Capital Matter for Innovation? Evidence from Japanese Start-ups. Journal of Small Business Management, **53(1),** 114-128 (2015).
19. A. Ardichvili, R. Cardozo, and S. Ray. A theory of entrepreneurial opportunity identification anddevelopment, Journal of Business Venturing, **18(1),** 105-123 (2003).
20. S. Shane. Prior knowledge and the discovery of entrepreneurial opportunities. Organization Science, **11(4),** 448-469 (2000).
21. S.W. Bradley, J.S. McMullen, K. Artz, and E.M. Simiyu. Capital is not enough: Innovation indeveloping economies, Journal of Management Studies, **49(4),** 684-717 (2012).
22. A.C. Corbett, H.M. Neck, and D.R. DeTienne. How corporate entrepreneurs learn from fledgling innovation initiatives: Cognition and the development of a termination script, Entrepreneurship Theory and Practice, **31(6),** 829-852 (2007).
23. M. Viswanathan, R. Echambadi, S. Venugopal, and S. Sridharan. Entrepreneurship, value creation, and community exchange systems: A social capital explanation, Journal of Macromarketing, **34 (2),** 213-226 (2014).
24. K.S. Mullakhmetov, R.D. Sadriev, L.A. Gabaidullina. *Influence of human capital characteristics on transformation of management and control in the management of social and economic systems*. Paper presented at the Proceedings of the 31st International Business Information Management Association Conference, IBIMA 2018: Innovation Management and Education Excellence through Vision 2020, 3562-3572 (2018).
25. O.N. Korableva, N. Gorelov, O. Kalimullina. Contemporary issues of intellectual capital: Bibliographic analysis, Lecture Notes in Mechanical Engineering, 13th World Congress on Engineering Asset Management, WCEAM 2018, 457-464 (2020). doi:10.1007/978-3-030-48021-9_51
26. M.K. Barcho, O.V. Otto, H.A. Hajiyev, V.O. Samusenkov, L.N. Korshunova, N.O. Vikhrova, N.N. Nikulin. Basic directions for forming perspective forms of agricultural integration, Entrepreneurship and Sustainability Issues, **8(1),** 960-971 (2020). doi:10.9770/jesi.2020.8.1(64)
27. E. Kirillova, I. Otcheskiy, S. Ivanova, A. Verkhovod, D. Stepanova, R. Karlibaeva, V. Sekerin. Developing Methods for Assessing the Introduction of Smart Technologies into the Socio-Economic Sphere Within the Framework of Open Innovation, International Journal of Sustainable Development and Planning, **18 (3),** 693-702 (2023). doi: 10.18280/ijsdp.180305
28. D. W. Hosmer, and S. Lemeshow. Applied Logistic Regression (2nd Edition), New York: John Wiley & Sons, Inc. (2000).
29. B. Kuziboev, P Vysusilova, R. Salahodjaev, A. Rajabov, T. Rakhimov. The Volatility Assessment of CO2 Emissions in Uzbekistan: ARCH/GARCH Models. International Journal of Energy Economics and Policy, **13(5)**, 1-7 (2023). doi: 10.32479/ijeep.14487
30. I. S. Abdullaev, and K. I. Khamraev, Modeling factors affecting net assets of investment funds using autoregressive distributed lag (ARDL) model, Journal of Critical Reviews, **7(12),** 987-990 (2020). doi:10.31838/jcr.07.12.174
31. R. Aleshko, L. Petrova, E. Ivanova, A. Plotnikova, M. Melnikov, V. Antonov. Human capital in the digital economy format, International Journal of Engineering and Advanced Technology, **9(1),** 7517-7523 (2019). doi:10.35940/ijeat.A2201.109119

32. A. Tikhonov. Applying of employer branding system in the IT-companies' human resource management. Espacios, **40(38),** 23 (2019).
33. E. Kot, T. Kruzhkova, O. Rushitskaya, A. Ruchkin, V. Kukhar, The problem of improving the competitiveness of enterprises in the system of socio-economic relations, IOP Conference Series: Earth and Environmental Science, **699(1)**,012058 (2021).
34. O.M. Trofimova, A.V. Ruchkin, V.S. Kukhar, E.M. Kot, O.A. Ruschitskaya. Subjective assessments' analysis of the control and supervision activities' impact on the functioning of small and medium-sized enterprises in the Russian Federation, WSEAS Transactions on Business and Economics, **18(6)**, 51-58 (2021).