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## Methodical Toolkit of Portfolio Management of Services of Professional Education

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# Methodical Toolkit of Portfolio Management of Services of Professional Education

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**Abstract.** The article forms the author's methodical toolkit for managing the portfolio of the professional education services, as well as the results of its application. To manage the portfolio of the professional education services it is proposed to analyse them in order to identify the most promising areas of activity of the higher education establishments in the market of the educational services. It is proposed to monitor the higher education establishments on the basis of the creation of the n-dimensional matrices, using which the business-units may be compared with each other according to the various criteria. With that end in view, the application of the matrix of the "Boston Consulting Group" is considered, but modified in such a way as, on the one hand, to preserve its main advantages including the simplicity of visual perception and the usual terminology, and on the other hand - to use it for the analysis of the portfolio of the professional education services, taking into account their features. The parameter K (market share) (the horizontal axis of the modified matrix) and the parameter T (demand in the market) (vertical axis of the matrix) serve as a characteristic of each service group. The results of the calculations show that the use of the Boston Consulting Group modified matrix in managing the portfolio of the professional education services will make it possible to allocate the professional education services that are in demand in the market and, consequently, to affect the education establishment competitiveness.

## 1. Introduction

Due to the transition of the state universities to autonomy, the conditions for the activity conducting of each institution change fundamentally. The image of the university, its ability to prepare specialists in demand in the labor market play an important role, and therefore a problem arises of increasing the university competitiveness.

In the conditions of the competition and the formation of the educational services market, the universities are forced to move to an intensive development model and to orient themselves to a great extent on their own resources. A competitive environment forms among the institutions of higher professional education [4].

The competitive environment conditions in the professional education determine the transition of the higher education institutions to an entrepreneurial development model that involves a constant search and study of the new opportunities for improving their activities. In such conditions, the possibility to meet the forecasts of the labor market becomes urgent for the universities. The analysis meant to identify the promising areas of the higher education institutions activity will make it possible to identify the professional education services in demand in the labor market, which will enhance the universities image and competitiveness.



The following scientists were engaged in the construction of the economic models in the conditions of the high competition using the theory of games and probability theory [1, 2, 5, 7, 8]. The following works are developed to the issues of the innovative activity development of as one of the factors of the socio-economic systems competitiveness increasing [9, 10, 11, 12]. The theoretical aspects of the portfolio analysis in conditions of uncertainty, as well as methodological aspects of practical calculations are presented in the following works [3, 6].

The review of the scientific works made it possible to generalize the accumulated experience, the specifics of the portfolio analysis in the context of the environment uncertainty and to note the current lack of the research in the forecasting the labor market needs in order to identify specialists in demand, as well as insufficiency of the development of the methodological approaches to the portfolio analysis of the professional education services. All of the above determines the relevance of the present research topic.

## 2. Research Methods

A portfolio of the professional education services is a set of services provided by a higher education institution at a given time or for a certain period of time. To manage the portfolio of the professional education services it is proposed to analyse them in order to identify the most promising areas of activity of the higher education establishments in the market of the educational services.

To manage the portfolio of the professional education services it is proposed to use the matrix of the "Boston Consulting Group", modified in such a way as, on the one hand, to preserve its main advantages including the simplicity of visual perception and the usual terminology, and on the other hand – to use it for the analysis of the portfolio of the professional education services, taking into account their features.

Thus, the "specific type of the professional education services", which is claimed in the labor market, is the basic unit of the research. The parameter K (market share) (the horizontal axis of the modified matrix) and the parameter T (demand in the market) (vertical axis of the matrix) serve as a characteristic of each service group.

As a characteristic of each service group (the horizontal axis of the modified matrix), the parameter K serves, which is the "specific weight of the vacant seats number in one of the directions in the total volume of the required employees by types of the economic activity" during the reference period. In this case it was one year (2016).

For each group of specialties, the parameter K is calculated by the following formula:

$$K_i = (Y_i / Y_0) * 100\% \quad (1)$$

where  $Y_0$  is a total amount of the required workers for the reporting period (2016);  $Y_i$  is a volume of the vacancies of the  $i$ -th group for the reporting period.

As a second characteristic of the goods group (vertical axis of the matrix) the parameter T serves, which is a "specific weight of the number of vacancies at the rate of change in demand in the labor market" during the analyzed period by a linear trend.

The linear trend allows the drawing of a conclusion about the direction of the indicator movement under the influence of many factors. The formula for the linear trend of the realization volume function is the traditional equation of a polynomial of the first degree:

$$Y_0 = A_0 * X + B_0 = A_0 * X + B_0 \quad (2)$$

where  $Y_0$  is an estimated volume of the demand in the labor market;  $X$  is a billing period (a year);  $A_0$  is an estimated change (increment or decline) of the demand compared to the previous billing period;  $B_0$  is a constant of the equation, which can be interpreted as the theoretical volume of the demand in the initial period (2016).

A similar formula determines the trend for a particular vacancy:

$$Y_i = A_i * X + B_i \quad (3)$$

At that  $Y_0 = \sum Y_i$ , i.e., a single increment of the total demand consists of single increments (with both signs) of the vacancies number by the types of the economic activity.

The parameter T determines the nature and size of the contribution of each group of vacancies to the change in the total rate of demand in the labor market and is determined for each group separately by the formula:

$$T = (A_i / A_0) * 100\% \quad (4)$$

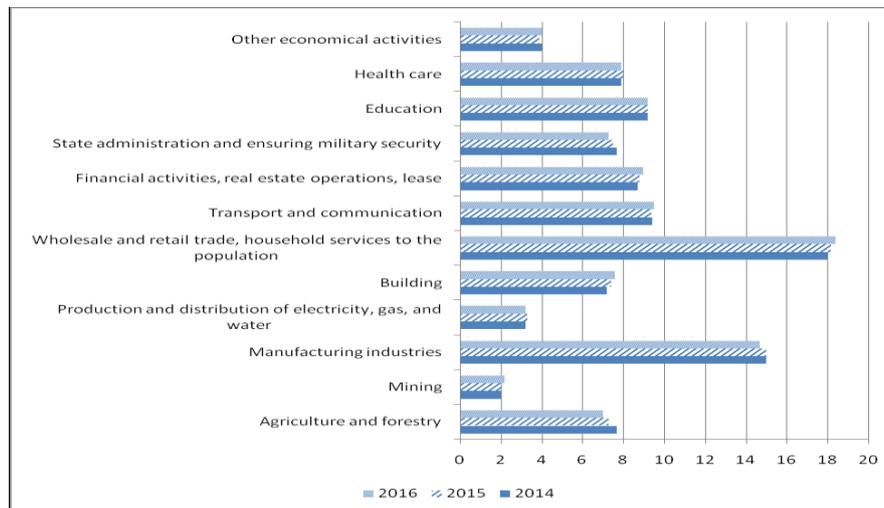
where  $A_i$  is an i-th group trend coefficient during the reporting period;  $A_0$  is a coefficient of the trend of the total realization volume in the reporting period.

Thus, for each group of vacancies a co-ordinate space was defined, where one of the coordinates (K) is a "market share", and the other (T) is a "demand in the market."

After calculating these values for each group, one obtains a parametric diagram (Fig. 2). The "Stars": high market growth and a high market share. The market share must be maintained or increased. This group of services brings great profits. The "Cash Cows": a high market share, but low market growth. Such services must be kept and monitored as much as possible. The "Dogs": low growth and low market share. It is necessary to get rid of this group of services. The "Difficult children" must be studied. In the future, they can become both stars and dogs. If there is a possibility to transfer them to the stars then they should be invested in, otherwise – get rid of.

### 3. Results and Discussion

Let's consider the activity of the labor market in Russia in 2014-2016. According to the analysis the largest number of the employees falls on the following spheres of economical activity: wholesale and retail trade, repair of motor vehicles, motorcycles, household goods and personal items; agriculture, hunting and forestry; manufacturing industries; transport and communication; building; education; health care and social services.



**Figure 1.** Structure of the employment by type of the economical activity in the Russian Federation, %.

Figure 1 shows the data on the number of required workers by the types of economical activity in the Russian labor market. So, the most popular positions in 2016 were: wholesale and retail trade, household services to the population; manufacturing industries; transport and communication; education; financial activities, real estate operations, lease; health care; building.

**Table 1.** The Results of the Parameters K and T Calculation (2016).

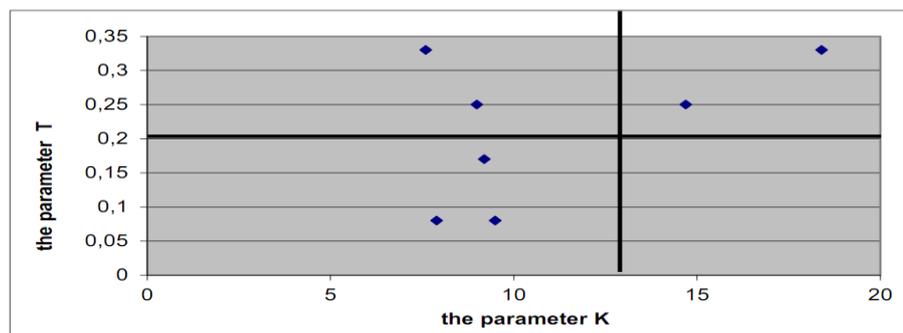
Type of the economical activity	Specific weight (K), %	A	Specific weight (T), %
Total in the economy, including	100		
wholesale and retail trade, household services to the population	18,4	0,2	0,33
manufacturing industries	14,7	0,15	0,25
transport and communication	9,5	0,05	0,08
Education	9,2	0,1	0,17
financial activities, real estate operations, lease	9,0	0,15	0,25
health care	7,9	0,05	0,08
Building	7,6	0,2	0,33

Thus, the subsequent analysis will be conducted precisely on these directions of the specialists training. As a characteristic of each service group (the horizontal axis of the modified matrix), the parameter K serves, which is the "specific weight of the vacant seats number in one of the directions in the total volume of the required employees by types of the economical activity" during the reference period. In this case it was one year (2016). The results of calculating the parameter K by the formula 1 are presented in Table 1.

As a second characteristic of the goods group (vertical axis of the matrix) the parameter T serves, which is a "specific weight of the number of vacancies at the rate of change in demand in the labor market" during the analyzed period by a linear trend. The results of calculating the parameter T are presented in Table 1.

Thus, for each group of vacancies, the coordinate space was defined, where one of them is K – "market share", and the other is T – "demand in the market". After calculating these values for each group, one obtains a parametric diagram (Fig. 2).

The resulting matrix allows us to draw the following conclusions. The economic activities "Wholesale and retail trade, household services to the population" and "Manufacturing industries" refer to the "stars": high market growth and a high market share. The market share must be maintained or increased. The following economic activities are classified as "difficult children" according to the resulting matrix: "Financial activities, real estate operations, lease" and "Building". These kinds of economic activities should be given special attention, because in the future they can become both stars and dogs. Therefore, it is necessary to use additional economic and mathematical methods to evaluate these types of activities in order to make a more precise decision on them: they should be developed in the higher education institution or not.

**Figure 2.** Modified BCG-matrix of the professional education services portfolio.

The rest of the groups of vacancies fall into the quadrant "dog": low growth and low share in the market. Thus, when training specialists, the higher education institutions in modern conditions should pay attention to two aspects: "Wholesale and retail trade, household services to the population" and "Manufacturing industries."

#### 4. Conclusion

The use of the modified Boston Consulting Group matrix in professional education services portfolio managing will make it possible to allocate professional education services that are in demand in the market, and, consequently, affect the higher education establishment competitiveness.

The higher education establishment competitiveness means an economic category reflecting its ability to produce a competitive "service", its competitive advantages in relation to other educational organizations within and outside the country.

It should be noted that in order to increase the reliability degree of the demand forecasts in the professional education services market, it is necessary to improve the proposed calculation methodology, to include competent and scenario approaches, expanding the range of the statistical data used and the forecasting horizon.

#### 5. References

- [1] Abdellaoui M, Baillon A, Placido L, Wakker P P 2011 The rich domain of uncertainty: Source functions and their experimental implementation *American Economic Review* **101** (2), 695-723
- [2] Borch K H 2015 The economics of uncertainty *Princeton : Princeton University Press* 227
- [3] Cox J C, Huang C-f 1989 Optimal consumption and portfolio policies when asset prices follow a diffusion process *Journal of Economic Theory* **49** (1) pp 33-83
- [4] Dolzhenkova E V, Iurieva L V 2016 Methodical Toolkit of Business Potential Evaluation of Autonomous Higher Education Institution RRI 2016 International Conference «Responsible Research and Innovation» 07 - 10 November 2016 Volume XXVI (17 July 2017) *The European Proceedings of Social & Behavioural Sciences EpSBS* pp 318-325
- [5] Gilboa I 2010 Theory of Decision under Uncertainty. Israel: *Berglas School of Economics, Tel-Aviv University* 215
- [6] Guidolin M, Rinaldi F 2013 Ambiguity in asset pricing and portfolio choice: A review of the literature *Theory and Decision* **74** (2) pp 183-217
- [7] Li Ya, Li Yo, Zhao Y 2014 Fang Wang Which Factor Dominates the Industry Evolution A Synergy Analysis Based on China's ICT Industry *Inzinerine Ekonomika-Engineering Economics* **25**(3) 273-282
- [8] Marinacci M 2015 Model uncertainty *Journal of the European Economic Association* **13**(6) 1022-1100
- [9] Rodriguez M 2014 Innovation, Knowledge Spillovers and High-Tech Services in European Regions *Inzinerine Ekonomika-Engineering Economics* **25**(1) 31-39
- [10] Stroeva O, Lyapina I R, Konobeeva E E, Konobeeva O E 2015 Effectiveness of management of innovative activities in regional socio-economic systems *European Research Studies Journal* **18**(3) 63-76
- [11] Wu W, Chen Q, Yu B, He H 2008 Effects of management innovation on telecommunication industry system *WSEAS Transactions on Systems* **7** (5) 455-46
- [12] Zdrzil P, Kraftova I, Mateja Z 2016 Reflection of Industrial Structure in Innovative Capability *Inzinerine Ekonomika-Engineering Economics* **27**(3) 304-315