Influence of Entrance Exams Results on Foreign Students in Economics Studies at University of Economics, Prague

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Background and purpose: The purpose of the article is to analyse results of entrance exams and of regularly exams for foreign students in the Czech language undergraduate study programs at four faculties of University of Economics, Prague (UEP) with the intention to investigate the dependency between the results of Entrance exams from English and mathematics and (1) results of regularly exams during the study and between (2) completion rate of the study.

Design/Methodology/Approach: We have analysed 4.381 records for applicants from foreign countries who applied for studies between years 2009 and 2015. We used standard statistics methods and the method of logistic regression in the form of logit model.

Results We identified weak statistical correlation between entrance exam results from mathematics and results of regular exams. The correlation coefficient varies between 0.078 – 0.283 for investigated faculties of UEP. The same indicator for English language exams presents better values and it varies between 0.218 – 0.312. If an entrance exam result is higher by one point, the probability of successful completion of studies is multiplied by values between 1.017 - 1.042 for individual faculty per one additional point.

Conclusion: The results of the research in mathematics and English language show that excellent results in entrance exam cannot not guarantee successful regularly exams. Conclusion for the probability of completing studies is that the acceptable level of points for admission foreign students is between 150 and 170 points, depending on the faculty.

Keywords: knowledge; foreign student; university; english language; mathematics

1 Introduction

Attempts at integration of the European countries is as old as mankind itself. Perhaps the most successful attempt was made by the Romans during the Roman Empire. Under their leadership, the cultures from the Pillars of Hercules (today's Spain) all the way to the Eastern Mediterranean Region thrived or forcibly cooperated (Dray, 1992). The following religion-based attempts, whether Christian (western or eastern) or Islamic, were not as successful. Recent history, and technological progress and gradual globalization, made it again possible for student exchanges between individual states and countries. The Western,

also so-called Euro-Atlantic, civilization, including Australia and New Zealand, has become considerably more advanced in this regard since the 17th century also thanks to no, or only a minimal, language barrier between these countries. Eastern Europe was under the Soviet influence after the end of WW II, and the Russian language became the main communication language on an international level within the Eastern bloc. The fall of the iron curtain provided a new opportunity to reintegrate all European countries. This opportunity opened up for the Czech Republic (CR) in 2004 when it joined other EU Member States during the second wave of enlargement (Lukes, Zouhar, Jakl and Ocko, 2013).

The goal of this article is to analyse the mathematics and English entrance exam results of foreign applicants for Czech study programs in the period of 2009 – 2015. Only regular students were included into this research, not students from exchange study programs such as Erasmus plus or students and applicants for foreign language study programs. Based on this performed analysis, is our goal to find out if there is a dependency between the results of the entrance exams in English and mathematics and the result of the exams later during the regular study. The second goal is to analyse the probability of successful graduation for certain level of obtained points in entrance exams.

2 Education in the Czech Republic

The education system in the Czech Republic has also gradually changed as the CR went from a centrally planned economy to a transition economy and finally to a developed market economy. The education system underwent the biggest change by joining the Bologna Declaration (Stastná & Walterová, 2014). The principles of the Bologna Declaration were not implemented immediately, but their implementation had a relatively high impact on the traditional education system. This is because university education used to be continuous, i.e. four years for economic studies, five years for other studies and six years for medical studies (Berka, Jablonsky, Marek and Vrabec, 2015; Hanclova and Doucek, 2012). The Bologna Declaration brought the system of three-year undergraduate studies and two-year consequent studies. This system, including the ECTS (European Credit Transfer System), which is generally accepted and respected not only in EU Member States but also in some other countries, such as Russia, Turkey and most countries of the former Soviet Union, makes it possible to exchange students between individual countries for one semester or a longer time period, e.g. entire undergraduate studies (Vltavska and Fischer, 2014, 2015). Transformation of an educational systems in the Visegrad four countries is analysed in more detail in (Herbst and Wojciuk, 2017).

Different view on education is mentioned by Neycheva (2016) and Simonova (2016). Neycheva (2016) analyses comparison between secondary and higher education from growth point of view, and Simonova (2016) analyses assessment preferences in learning styles in English, which are important for successful finishing of studies at University of Economics, Prague (UEP).

Very important factors influencing Czech education and attempts for improving academic performance, which are described for example in (Ling and Ling, 2001; Heick, 2014).

Economic education in the Czech Republic is currently organized in compliance with the Bologna Declaration; i.e.

as three-year undergraduate studies and a two-year master's program. Economic studies usually require skills and knowledge that include logical thinking, work with abstract terms and operations, communication skills, the ability to work with foreign language materials and the ability to work in an international environment and to integrate international initiatives (Marek, 2010). This paradigm leads to two basic areas that are usually applied in selecting applicants for economic studies, i.e. mathematics and a foreign language. Nowadays, the lingua franca is English, which is not the most spoken language in the world, but a dominant language for the European community.

Our article analyses the results of English and mathematics entrance exams taken by applicants (applicant, in context of this article, is a person with completed middle school education, who applies for study at UEP) for economic undergraduate studies. For our total analysis of faculty attractiveness, we processed the data from all faculties of the University of Economics, Prague. The specialization of the faculties is rather wide and practically includes all fields of economic science. These faculties are as follows:

1. Faculty of Finance and Accounting - FFA - finance, accounting, taxes, etc.
2. Faculty of International Relations - FIR - international relations, diplomacy, law, etc.
3. Faculty of Business Administration - FBA - microeconomics, marketing, management, business economics; and
4. Faculty of Informatics and Statistics – FIS - quantitative methods in microeconomics, macroeconomics and business informatics.

For the remaining two faculties, i.e.

5. Faculty of Economics – FE - macroeconomics, regional economics, economic policy; and
6. Faculty of Management – FM - that teaches business management, health care management and management theory (more detail information at www pages of the UEP[1]),

we managed to identify the number of applications and the number of admitted students but not entrance exam results. Therefore, these two faculties (5, 6) were excluded from our detailed analysis. Descriptive statistic, as for example number of applicants and number of accepted students, were calculated using data from all faculties of UEP.

At all faculties, students can study Czech study programs as well as a limited number of other study programs that are usually taught in English. Study programs taught in Czech are attended by foreign students, who either have relationship to the Czech Republic from the past or speak one of the Slavic languages. Most students interested in these study programs come from the former Soviet Union

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1 www.vse.cz

and Slovak Republic (Maryska and Doucek, 2015). Foreign students are participating in Czech study programs together with Czech students. The advantage of these study programs is that they can be expanded with selected courses in other languages. These supplementary courses are mostly taught in English, but also in German and Spanish. General overview of applicant's structure at UEP is presented in the Table 1.

Numbers presented in Table 1 indicate that UEP's Czech economic study programs are attractive for students from Slovakia who have no, or a very low, language barrier. The very slight increase in this group of students during the period of 2009 – 2015 is very interesting. The main reason for increasing the number of Slovak students can be identified in opportunities for part time and full-time jobs during study period in domestic and international companies. Students from the Russian Federation placed second. The difference between their native language and the Czech language is much bigger, yet their number kept growing during the period of 2009 – 2015 and their percentage has doubled by 2015. The number of foreign

applicants during the period of 2009 – 2015 by faculty is shown in Figure 1.

Figure 1 clearly shows that foreign students are mostly interested in the study programs of FBA, followed by the study programs of FFA. They are the least interested in the study programs of FM, which may be due to the fact that the faculty specializes in management theory and health care management and/or because the faculty is located outside Prague – in Jindřichův Hradec (in South Bohemia, approximately 150 km south of Prague).

The number of applicants is not, however, the main indicator even though it shows the popularity of the individual study fields. The number of admitted students is reflected in their representation in the individual study programs of the faculties (Figure 2).

Figure 2 shows that however, the number of admitted students does not provide the real picture of the number of foreign students in Czech undergraduate study programs either. The indicator that is really important is the number of students who enter the university. The number of admitted students does not necessarily mean the number of

Table 1: Percentage of students applying to UEP by citizenship. Source: (authors, data UEP)

|	2009	2010	2011	2012	2013	2014	2015	Total
Czech Republic	81.93%	81.88%	81.14%	79.76%	76.95%	73.37%	73.79%	78.94%
Slovak Republic	6.12%	6.65%	6.56%	6.71%	6.87%	6.87%	6.95%	6.64%
Russian Federation	5.06%	4.39%	4.77%	5.39%	7.19%	9.75%	10.16%	6.32%
Republic of Kazakhstan	2.09%	2.01%	2.16%	2.04%	1.85%	2.15%	1.98%	2.04%
Ukraine	1.33%	1.36%	1.58%	1.92%	2.26%	2.90%	3.39%	1.99%
Vietnam Socialist Rep.	1.17%	1.19%	1.71%	2.09%	2.42%	2.16%	0.66%	1.63%
Belarus	1.06%	1.43%	1.08%	0.87%	0.93%	0.99%	1.20%	1.08%
Moldova	0.30%	0.12%	0.20%	0.18%	0.21%	0.15%	0.12%	0.19%
Other Countries	0.94%	0.97%	0.80%	1.04%	1.32%	1.66%	1.75%	1.17%
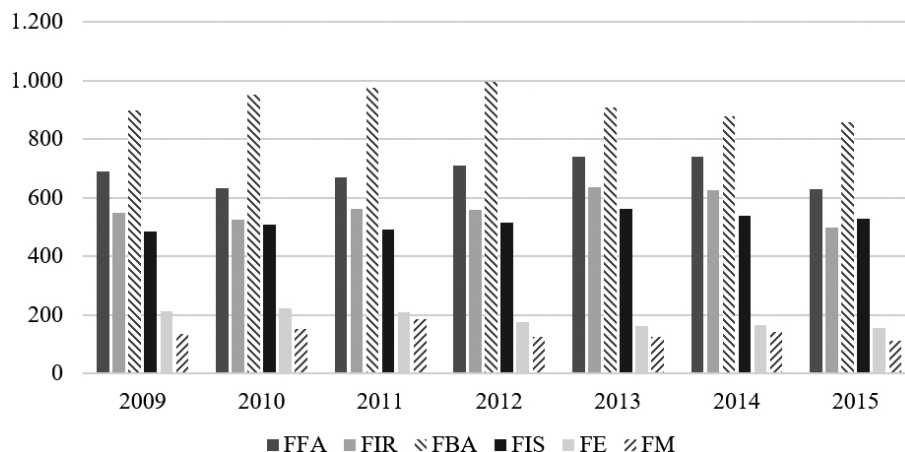
Figure 1: Trend in the number of foreign applicants between 2009 and 2015 by faculty. Source: (authors)
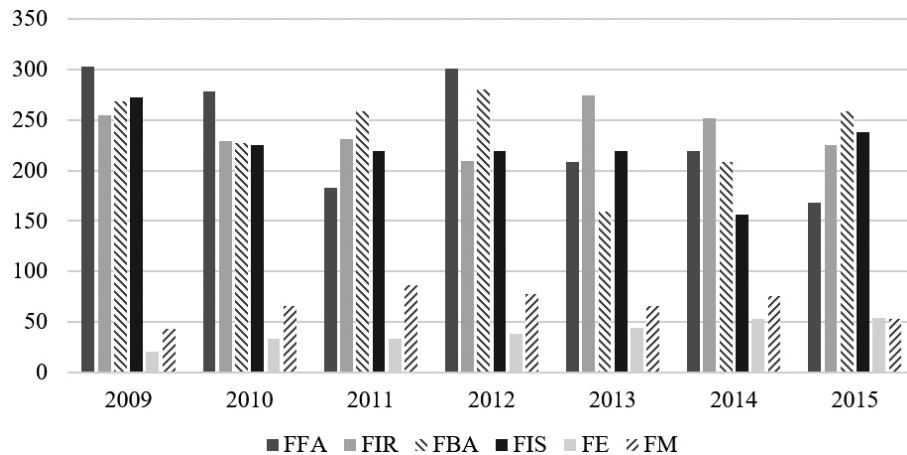
Figure 2: Trend in the number of accepted foreign students during the time period of 2009 – 2015 by faculty. Source: (authors)
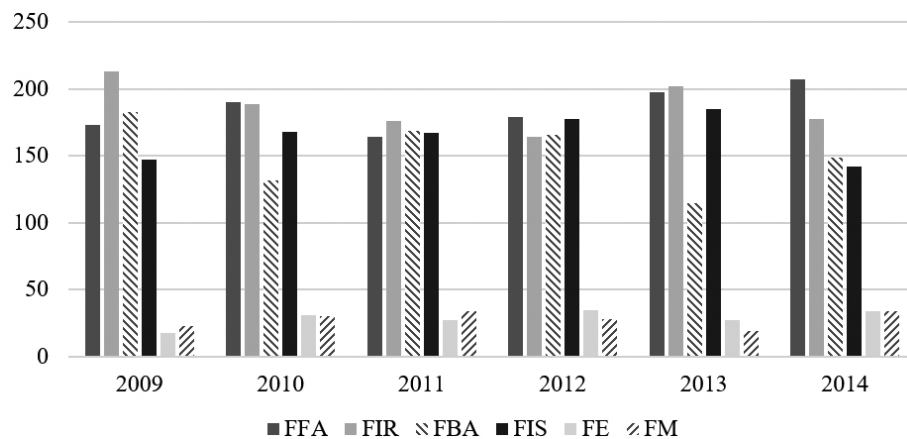

Figure 3: Trend in the number of admitted foreign students who entered the university during the time period of 2009 – 2015 by faculty. Source: (authors)

students who actually enter the university because students may pass an entrance exam and be admitted to different study programs at several universities but will enter only one university.

Figure 3 provides only data up to 2014, when the enrolment process for foreign students changed and we were not able to collect data on enrolled foreign students by faculties any more. Therefore, only data for the period 2009 – 2014 were used in further analysis.

3 Research Questions

The target group of our analysis were foreign students who applied for undergraduate study programs taught in Czech. Based on the analysis presented in the previous chapter, we formulated the following three research questions (RQs):

- RQ1: Students who obtained a higher number of points in their mathematics entrance exam have better

results in mathematics courses during their studies.
- RQ2: Students who obtained a higher number of points in their English entrance exam have better results in English courses during their studies.
- RQ3: Students who obtained a higher number of points in their total entrance exams (mathematics and English) have a better chance of completing their bachelor's studies.

The mathematics and English are defined on the first place, because currently the University has serious problems with results in standard exams in the area of mathematics and English, which are mandatory courses.

Above mentioned research questions are analysed for the entire group (for University of Economics, Prague) and by faculty.

4   Methodology of Data Collection, Processing and Evaluation

All data used for this article were obtained from UEP's entrance exams or exam agenda. The data were entered in the Internal Information System (InSYS). The basic problem was anonymization of data. The data collected for entrance exam proceedings or exam agenda processing are, in compliance with the requirements of Act No. 101/2000 of Coll.[2], anonymized (i.e. do not include any information that could identify specific persons) before they are further processed. This act requires that such data do not provide an opportunity to track down a specific applicant or to obtain his or her personal data, such as date of birth, first name, last name, etc. Data were paired by way of system unique id (database primary key), which was included in all data extracts.

We analysed only the data of foreign students who filled in an application for UEP's undergraduate study programs during the time period of 2009 – 2015. For the purposes of our analysis, foreign students mean students whose applications show a citizenship other than the citizenship of the Czech Republic.

We analysed the sample of the data of all foreign students who:

- met the condition for RQ1, i.e. have both a mathematics entrance exam grade as well as a grade in mathematics from a regular exam during their studies;
- met the condition for RQ2, i.e. have both an English entrance exam grade as well as a grade in English from a regular exam during their studies;
- met the condition for RQ3, i.e. have an entrance exam result and also completed (passed/failed) their studies, which means do not have the status "studies suspended" or "currently studying," etc.

We verified the research questions, using standard statistical methods. We described the analysed sample, using descriptive statistics, such as the number of records, mean, standard deviation, sample variance, kurtosis and skewness. Furthermore, to verify research question RQ1 and RQ2, we calculated a correlation coefficient. We were able to use this method since both variables show the normal distribution with a similar standard deviation.

The maximum number of points, which can be gained by applicants during entrance exam from mathematics, is 100 points (not percentage) and the same amount of points can be gained from English. The max total number of points from exam from both subject is 200 points. Results from standard exam can be in range from 1 (the best result

= A) to 4 (the worst result, failed = F).

The entrance exam results and the regular exam results had to be consolidated so that they could be compared. Regular exam results of 1 - 4 (4 – meaning failed) were transformed into the values of 50, 60, 75 and 90 as shown in Table 2 below. The entrance exam results were also transformed into the values of 50, 60, 75 and 90; any value higher than 90 points obtained for an entrance exam was transformed into the equivalent value of 90 used for the calculation of a correlation coefficient (see Table 2).

In the case of Research question RQ3 analysing the correlation between an entrance exam result and a successful or failed completion of studies, we transformed the completion of studies into the binary values of 0 and 1, where 0 means a student failed his studies and 1 means that a student successfully completed his study. To calculate the correlation values, we used the logistic regression, where the binary variable of studies completion was the dependent variable and the number of points obtained in an entrance exam was only one independent quantitative continuous variable (Kuncova and Wasserbauer, 2007; Rezankova, 2010). The probability of studies completion is marked as p. Then:

$$\ln (p/1\text{-}p) = \beta_o + \beta_1 X \tag{1}$$

where is X is a number of obtained points from entrance exams,

- β_o - constant,
- β_1 - increment - points from entrance exam,
- p - probability of successful study completion.

To calculate the actual correlation, the SPSS application has been used, and to accept or reject the null hypothesis of regression parameters being zero has been used the Wald test (Rezankova, 2010) where we rejected this hypothesis if the Wald test was higher than zero.

The logistic regression (1) shows that

$$p = e^{(\beta_o + \beta_1 \text{ NPOEE})}/ (1 + e^{(\beta_o + \beta_1 \text{ NPOEE})}) \tag{2}$$

where is number of obtained points from entrance exams,

- β_o - constant,
- β_1 - increment - points from entrance exam,
- p - probability of successful studies completion. The estimated probability of successful studies completion if a certain number of points is obtained in an entrance exam, and
- NPOEE - the number of points from entrance exams.

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2 https://www.uoou.cz/en/vismo/zobraz_dok.asp?id_org=200156&id_ktg=1107&archiv=0&p1=1105

This act shall apply to personal data that are processed by state authorities, territorial self-administration bodies, other public authority bodies, as well as natural and legal persons. „Anonymous data" shall mean such data that cannot be linked to an identified or identifiable data subject in their original form or following processing thereof.

Table 2: Mapping of the correlation between the number of points obtained in an entrance exam and the number of points obtained in a regular exam Source: (authors, data UEP)

Result Entrance Exam	Mapping Used for Correlation	Exam	Mapping Used for Correlation
<90 – 100> points	90 points	Grade 1	90 points
<75 – 90) points	75 points	Grade 2	75 points
<60 – 75) points	60 points	Grade 3	60 points
<0 – 60) points	50 points	Grade 4	50 points

Table 3: Characteristics of the Group and Results in Mathematics – the first value in a cell (in columns between "Mean" to "Skewness") applies to the mathematics entrance exam; the second to the mathematics regular exam Source: (authors, data UEP)

	N	Mean	Standard Dev	Sample Var	Kurtosis	Skewness	Correl
Total	4.381	75.374/63.470	13.634/13.561	185.876/183.905	-1.118/-0.691	-0.394/0.734	0.241
FFA	1.171	78.642/65.961	12.018/14.198	144.437/201.576	-0.643/-1.092	-0663/0.469	0.231
FIR	1.247	74.479/60.383	14.004/13.536	196.117/183.211	-1.279/-0.808	-0.279/0.637	0.269
FBA	1.009	78.012/62.567	12.310/12.700	151.529/161.306	-0.655/-0.368	-0.636/0.834	0.078
FIS	954	69.743/60.386	14.387/12.997	206.991/168.925	-1.321/0.163	0.128/1.160	0.283

5 Results

To evaluate the research questions, we could use only the data from four faculties since FM and FE have a different admission procedure without a unified mathematics and English entrance exam and their data are not included into our research.

Table 3 presents a comparison and statistical analysis of the results of entrance and regular exams in mathematics by faculty.

The analysis of the result shows a very weak correlation between the points for a mathematics entrance exam and the points for a mathematics regular exam. The weakest correlation is at FBA (0.078). Therefore, we can conclude that "business economics and management" are not built on the use of mathematical methods, and therefore mathematics is not being developed very much. On the other hand, the strongest correlation between the results of these two exams is at FIS (0.283), which is to be expected, although we would have expected an even stronger correlation. The overall correlation for the entire data group is also weak (0.241), therefore RQ1 cannot be accepted for the entire group and for the individual faculties.

Table 4 presents a comparison and statistical analysis of the results of entrance and regular exams in English by faculty. The results obtained from this correlation analysis are even more surprising than those for mathematics. The correlation between the points obtained in an English entrance exam and the points obtained in an English regular exam during studies is somewhat higher than in the case of mathematics, but the correlation coefficient is still

very small. The entire group shows a value of 0.292, which is a weak correlation. Higher values are achieved at FIR (0.299) and FBA (0.312) – this value is the highest of the entire analysed group. The lowest correlation coefficient for students of FIS (0.218) is expected since this faculty focuses more on mathematics. The correlation for the entire data group is stronger as compared to mathematics but is overall weaker than expected. Therefore, we can conclude that RQ2 has not been confirmed for the entire group nor the individual faculties.

To verify RQ3, we used, as specified in chapter 4, the method of logistic regression, using the SPSS. The output from the SPSS for the entire UEP is provided in Table 5.

Table 5 shows that we can reject RQ3, on the significance level "Sig.," the null hypothesis of regression parameters (the Wald text is higher than zero). From equation (2) and Table 5 we can formulate that the probability that a student will complete his studies is shown by equation (3):

$$p = e^{(-4.99 + 0.030\ NPOEE)} / 1 + e^{(-4.99 + 0.030\ NPOEE)} \quad (3)$$

where is NPOEE is the number of points from entrance exams.

The value Exp (B) in Table 5 shows how the probability of completion goes up with each point obtained at the entrance exam. For the entire UEP, the probability of completion goes up 1.031 times.

Therefore, e.g. for 150 points obtained for an entrance exam, p = 0.38, for 190 points, p = 0.67 and for 200 points, p = 0.73. The minimum number of points from both exams is 0 points and max number from both exams is 200 points. The table 6 contains results for 3 levels of points, 100, 150

Table 4: Characteristics of the group and results in English – the first value in a cell (in columns between "Mean" to "Skewness") applies to the mathematics entrance exam; the second to the mathematics regular exam. Source: (authors, data UEP)

	Sum	Mean	Standard Dev	Sample Var	Kurtosis	Skewness	Correl
Total	3.604	73.490/74.234	12.040/16.346	144.948/267.190	-0.914/-1.144	-0.140/-0.425	0.292
FFA	914	75.126/5.881	10.714/15.866	114.798/251.712	-0.930/-1.197	-0.057/-0.618	0.242
FIR	1.273	75.287/75.687	11.566/15.450	133.782/238.698	-0.890/-1.210	-0.221/-0.562	0.299
FBA	803	72.821/73.344	12.394/16.130	153.499/260.159	-0.954/-1.476	-0.125/-0.327	0.312
FIS	614	68.200/69.935	12.772/18.218	163.110/331.889	-0.984/-1.831	0.223/0.014	0.218

Table 5: Calculations of the Model for Entire UEP Source: (authors, data UEP)
Note: B = the coefficient for the constant (also called the "intercept") in the null model; S.E. = the standard error around the coefficient for the constant; Wald = determine statistical significance for each of the independent variables; Df = the degrees of freedom for each variable; Sig. = statistical significance of the test; Exp(B) = the exponentiation of the B coefficient, which is an odds ratio

	B	S.E.	Wald	Df	Sig.	Exp(B)
Exam Results β1	0.030	0.002	228.335	1	0.000	1.031
Constant β0	4.990	0.324	237.571	1	0.000	0.007

Table 6: Success rate increase for UEP and the analysed faculties. Source: (authors, data UEP)

	Exp (B)	Wald test	100 Points	150 Points	200 Points
UEP	1,031	228,335	0.120	0.378	0.733
FFA	1,042	76,428	0.045	0.268	0,740
FIR	1,027	54,926	0.223	0.525	0.810
FBA	1,017	17,391	0.274	0.469	0.674
FIS	1,022	20,493	0.091	0.232	0.475

and 200 points.
We performed the analysis and calculations for all faculties of UEP and the overall result is provided in Table 6.

Table 6 shows that the probability of completion goes up the most with an increasing number of points at FFA – 1.042 times with each obtained point and the least at FBA 1.017 times. Table 6 also shows the probability of completion for the typified number of points obtained for an entrance exam – the points are 100, 150 and 200. In this case, the difference between the individual faculties is really huge since the probability at FIR is 0.810 while that at FIS is only 0.475.

We found the dependency between the entrance exam results and probability of successful completion of undergraduate studies. We identified it as positive (better entrance exam results increase the probability of successful completion of studies). There is a big difference between the faculties, and the strongest correlation is at FIR and the weakest at FIS.

We can conclude that RQ3 has been confirmed for both the entire group and the individual faculties.

6 Conclusions

The fact in the overall summary of our findings is that the total number of foreign students applying every year to UEP's Czech study programs during the period of 2009 – 2015 was practically constant (760 students in 2009, 744 students in 2014). Decreases are minimal and different over time. The number fluctuates between 740 and 760.

Foreign students at the Faculty of International Relations have the highest probability of completing their studies, based on their entrance exam results. This faculty (where International Trade is the major field of study) essentially educates specialists in the international environment, in particular trade, political science and diplomacy. Both the nature of these studies and the motivation of foreign students, who are educated in and for a multi-cultural environment, contribute to the higher success rate in their studies as a whole. On the other hand, the major focus of the Faculty of Informatics and Statistics on informatics or quantitative methods is often very surprising and foreign students have problems dealing with it. In fact, students

who applied to the Faculty of Informatics and Statistics sometimes try to figure out what they would like to study and, after the first year, take entrance exams to other faculties of UEP or even to other universities that focus more on humanities.

Another basic limit concerning our reflections and calculations is the fact that the entire UEP has a relatively large group of foreign (and not only foreign) "students" who obtain a very small number of ECTS credits in the first semester or the first year. These students very quickly changed their priorities during or even before the first semester and are not in fact interested in studying the field of study or faculty they chose. They prefer to work in the Schengen Area. After having discontinued their studies due to an insufficient number of ECTS credits, they return to their homeland or move to other states of the Schengen Area. Sometimes they stay in the Czech Republic and repeatedly take entrance exams to another faculty of UEP or to faculties of other universities.

Further question that must be answered by deans annually by entrance procedures is "How many obtained points is sufficient for entrance to study program?" By answering this question, we can meet two different approaches. The first one – pragmatic one – is to enrol the highest number of students that is possible, because the financial payment from the Ministry of Education, Youth and Sport is "per capita". The second approach is related to quality of students and to further quality-oriented indicators as for example are completion rate, time to degree and retention or dropout rate. Results of our research showed that to enrol students on the level of 150 points from entrance exams is acceptable for FIR and FBA. If faculty enrols students under the level of 150 points, it is sure that they apply pragmatic approach, but not the quality-oriented approach.

In this article presented research offers to faculty management basic sources for decision making process in enrolment of applied students for economic studies at University of Economics, Prague.

7 Further research

In our survey, we shall analyse individual groups of students based on the number of ECTS credits obtained in the first semester or the first year. We shall group students using a cluster analysis. We shall decide whether to use a single-criterion cluster analysis, where the criterion shall be the number of obtained ECTS credits, or a multi-criterion cluster analysis, where the number of obtained ECTS credits and e.g. the completion of some key subjects in the individual fields of study or the completion of entire studies (e.g. macroeconomics, microeconomics or mathematics courses) and final grades shall be considered. After that we shall normalize the data, i.e. we shall convert all criteria to the same scale (0;1). It may seem an unnecessary step since the values are already from the given scale;

however, this normalization shall readjust extreme values and their significance for the entire model. The next step shall involve the application of the model of probability of completion of studies for individual groups that we obtained, using the cluster analysis.

The subjective perception of studies by students represents another factor that affects the study results at the university. We expect to take this factor into account in our survey conducted among students in the form of a questionnaire. We are currently working on the questionnaire and we would like to analyse the following factors in particular:

1. Reasons for problems in handling studies on the part of the student:
   - Predisposition factors (lack of skills, unsuited motivation, personality characteristics);
   - Unsuited behaviour patterns (bad study habits, procrastination);
   - Insufficient initial knowledge base.

2. External reasons:
   - Environmental factors (general adaptation problems, family problems, problems with integration in the social environment);
   - The student's financial situation;
   - Unreasonable study demands, unsuitable way of teaching;
   - Cultural differences in teaching and in the social environment.

The next steps of this research are based on new approach of data gathering, which will be based on real-time gathering. This real-time gathering will relate to changes in data model and extension of the data model for new data.

We expect, that this change helps us with implementation of predictive-analytics which will improve the pass-rate of the student. One of the best-case scenario will be contacting of students which are not visiting lectures or have not good results in tests during semester. This is crucial part of the project which is requested by the project sponsor.

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