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THE DETERMINANT OF SUCCESS IN BASIC ECONOMICS COURSES TAUGHT BY THE DEPARTMENT OF ECONOMICS AT THE UNIVERSITY OF ECONOMICS IN PRAGUE

MICHAL MIRVALD, MARTINA TOMÁNKOVÁ

Abstract:

In comparison with other basic courses at the University of Economics in Prague there are basic economics courses taught by the Department of Economics that regularly show higher fail rates, specifically more than 35 %. A standard evaluation should be done in time and shall use different methods. Using quantitative methods, our analysis tries to identify key determinants of students' success. The data were obtained via a questionnaire during the last lectures in the winter semester of 2016/17 and in the winter semester of 2017/18. As opposed to existing studies, we also consider variables that weren't previously possible to observe, such as the use of IT technologies during lectures and studying from materials in electronic form.

Keywords:

Economics, economics courses, education, determinant, fail rate, midterm points, test score

JEL Classification: A10, A20, C20

Authors:

MICHAL MIRVALD, Department of Economics, Faculty of Economics, University of Economics in Prague, Czech Republic, Email: michal.mirvald@vse.cz

MARTINA TOMÁNKOVÁ, Department of Economic and Social Policy, Faculty of Economics, University of Economics in Prague, Czech Republic, Email: xtomm50@vse.cz

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1. Introduction

The University of Economics in Prague is a high-prestige Economics University in the Czech Republic and is one of the best “business schools” in Central and Eastern Europe. Basic economics courses taught here by the Department of Economics have regularly shown relatively high fail rates for years in comparison with other basic courses, and it is not exceptional to have a fail rate higher than 35 %. Our analysis tries to identify key determinants of students’ success in their study of these courses, which can be affected by student’s behavior, method of study (study style) or diligence. Of course many other variables can be considered, such as performance in other subjects, study results from high school, previous knowledge of economics, etc.

Anderson et al. (1994) wanted to explore the extent to which it’s possible to predict the success of students at universities in light of their performance at high school. Their analysis is concerned with a basic economics course. The authors have available data from the winter semester of 1988 and the summer semester of 1989 from the University of Toronto. On average, 62,5 % of students didn’t achieve a result which would enable them to pursue the following economics course. Their model considers variables such as sex, age, year of study, campus and results from the courses of their last year of high school in English, economics and math. In total, the authors worked with the data of 6,718 students. The results show that if a student has already completed an economics course in high school and if he reached at least 76 %, there is substantial positive effect on his result at university. The same applies for the math course. A surprise is the influence of English language and sex. The better their results in English language at high school, the worse their results in the economics course at university. The analysis also confirmed that men are more successful in the economics course than women.

Van Overwalle (1989) explored the relationship between the success of students from the university in Brussel and their self-evaluation and social background. The analysis works with the data of 240 students who were twice interviewed – once before the final exam and then again afterwards. The method used in the study is a multidimensional scaling which uses explanatory variables such as: study style of preparation for the final exam, mid-term results, self-confidence, fear of exam, previous knowledge, help from others or socio-economic background. The results show that the strongest correlation is between the results from the mid-term and final exams. Another significant variable is study style as well as course attendance. Previous knowledge is also proven to be significant. The study also detected a smaller effect from leisure time activities and socio-economic background on the success of university students.

Kherfi (2008) searched for the determinants of university students’ success in basic economics courses. The study was run at the American University of Sharjah. Though the university is located in the United Arab Emirates, it is based on the American model of education. The final dataset used in this study contains 2,844 observations, and the

data was taken for 11 terms from 2000 to 2004. The University is multicultural as its students are from 73 different countries.

The author applied regression analysis on the given dataset and used explanatory variables such as nationality, sex, class duration, class size, class intensity, basic mathematics and English skills and teacher. The results show on the one hand that the teacher is a significant variable concerning the student's results. On the other hand, variables like class duration, class size and class intensity were almost always insignificant. Also, the better a student's mathematical and English skills, the better their results in the economics course. The results confirmed that men achieved higher results than women, *ceteris paribus*. Concerning nationality, it was proven by the model that students from GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE) didn't achieve as good results as students of other nationalities.

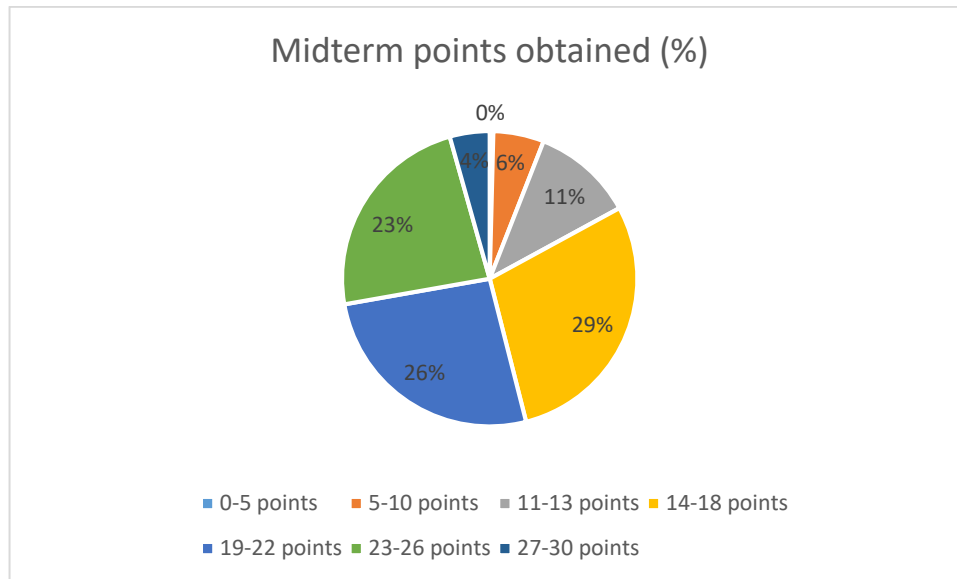
As opposed to the above mentioned studies, this study adds variables which were previously not possible to observe and use. Our approach adds IT technologies that students might use during lectures to the model, and this study aims at exploring if and how IT technologies influence students' success. More generally, our findings can be used by the university financing system (Horváthová, 2016) or a faculty budget construction.

2. Data and Methods

In our analysis we are concerned with an introductory economics course provided by the Department of Economics in the winter semester of 2016/17 and winter semester of 2017/18. There were 661 students in sum from two faculties in the course and the final fail rate was 35,7 % on average¹. The data for our research were obtained during the last lecture via a questionnaire to which 252 students responded.

Having no results from the final test and in view of the fact that there is a strong correlation between the midterm and final test results (Overwalle, 1989) and the total students' success in the course, we assume the midterm test score as a dependent (response) variable. Students could reach a maximum of 30 points. Figure 1 shows the distribution according to the points obtained (in percent).

¹ In the winter semester of 2016/17 the final fail rate was 38,11% and in 2017/18 it was 33,33 %.

Figure 1. Percentage distribution of students according to the midterm points obtained

Source: own elaboration

We included the following independent variables in the model: absence from lectures; seat position in the lecture hall; method of taking notes; date of the final test; repetition of the course; knowledge of the author and title of the mandatory study literature and the number of pages in this textbook; corresponding knowledge of voluntary literature; gender; notebook switched on during lectures; student's native language; regularity of independent study during the course; expected time of preparation for the final test; method of studying; and field of study. The list of explanatory variables is summarized in the Table 1.

Table 1. Overview of independent variables considered

Variable	Variable's meaning and explaining
<i>absence1-2</i>	1 – 2 student's absences from a total of 13 lectures
<i>absence3-4</i>	3 – 4 student's absences from a total of 13 lectures
<i>absence5-6</i>	5 – 6 student's absences from a total of 13 lectures
<i>absence7</i>	7 or more student's absence from a total of 13 lectures
<i>Middle</i>	Student sits in the second third of the lecture hall (5th -7th row of seats).
<i>Back</i>	Student sits in the last third of the lecture hall (8th or higher row of seats).
<i>Laptop</i>	Student takes notes via laptop.
<i>Tablet</i>	Student takes notes via tablet.
<i>no notes</i>	Student doesn't take any notes.
<i>exam2</i>	Student has registered for the final test administered in the second week.
<i>exam3</i>	Student has registered for the final test administered in the third week.

<i>exam0</i>	Student still hasn't registered for the final test.
<i>repeat2</i>	Student is repeating the course.
<i>textbook_part</i>	Student knows the title of the mandatory textbook or the name of the author of this book.
<i>textbook_none</i>	Student doesn't know the title of the mandatory textbook and the name of the author of this book.
<i>pages_wrong</i>	Student hasn't correctly given the number of pages of the mandatory textbook.
<i>optional_textbook</i>	Student uses another optional textbook.
<i>laptop_usage</i>	Student's laptop or tablet is regularly switched on during lectures.
<i>Woman</i>	Student is a woman.
<i>Language</i>	Czech isn't the student's native language.
<i>preparation<1</i>	Less than 1 hour of independent study a week.
<i>preparation1-2</i>	1 - 2 hours of independent study a week.
<i>preparation2-3</i>	2 - 3 hours of independent study a week.
<i>preparation4+</i>	4 or more hours of independent study a week.
<i>exam_prep0-3</i>	Student plans 0 - 3 days of preparation for the final test.
<i>exam_prep4-6</i>	Student plans 4 - 6 days of preparation for the final test.
<i>exam_prep14+</i>	Student plans more than 14 days of preparation for the final test.
<i>study_electronic</i>	Student is used to preparing for the final test only by reading study materials in electronic form.
<i>study_print</i>	Student is used to preparing for the final test only by reading study materials in printed form.
<i>study_different</i>	Student is used to preparing for the final test with another method.
<i>informatics_field</i>	Student's field of study is applied informatics.
<i>banking_field</i>	Student's field of study is banking.

Source: own elaboration

We use a method of interval regression analysis, where the midterm test score will form the lower and the upper interval limits.

The specification of the model follows:

$$\begin{aligned}
 In_points_low; In_points_high = & \beta_0 + \beta_1 absence1-2 + \beta_2 absence3-4 + \beta_3 absence5-6 + \\
 & \beta_4 absence7 + \beta_5 middle + \beta_6 back + \beta_7 laptop + \beta_8 tablet + \beta_9 smartphone + \beta_{10} no_notes \\
 & + \beta_{11} exam2 + \beta_{12} exam3 + \beta_{13} exam0 + \beta_{14} repeat2 + \beta_{15} repeat3 + \beta_{16} repeat3+ + \beta_{17} \\
 & textbook_part + \beta_{18} textbook_none + \beta_{19} pages_wrong + \beta_{20} optional_textbook + \beta_{21} \\
 & laptop_usage + \beta_{22} finance_fac + \beta_{23} informatics_fac + \beta_{24} another_fac + \beta_{25} \\
 & finance_field + \beta_{26} informatics_field + \beta_{27} banking_field + \beta_{28} accounting_field + \beta_{29} \\
 & woman + \beta_{30} language + \beta_{31} preparation<1+ \beta_{32} preparation1-2 + \beta_{33} preparation3-4 + \\
 & \beta_{34} preparation4+ + \beta_{35} exam_prep0-3 + \beta_{36} exam_prep4-6 + \beta_{37} exam_prep14+ + \beta_{38} \\
 & study_electronic + \beta_{39} study_print + \beta_{40} study_different + \beta_{41} informatics_field + \beta_{42} \\
 & banking_field
 \end{aligned}$$

3. Analysis and Findings

The estimations of interval regression show the following statistically significant variables of at least 0,1 level: *absence1-2*; *absence3-4*; *absence5-6*; *exam2*; *exam3*; *preparation2-3*; *exam_prep0-3*; *exam_prep4-6*; *study_print*; *study_different*; *banking_field*.

Table 2. The estimations of interval regression ^{abc}

Variable	Mean	Std. Dev.
Const	2,9521 ***	0,0867
<i>absence1-2</i>	-0,1325 ***	0,0404
<i>absence3-4</i>	-0,1671 **	0,0675
<i>absence5-6</i>	-0,2626 *	0,1395
<i>absence7</i>	-0,1385	0,2017
<i>Middle</i>	0,0598	0,0447
<i>Back</i>	-0,0080	0,0554
<i>Laptop</i>	0,0390	0,0831
<i>Tablet</i>	0,0690	0,2878
<i>no_notes</i>	0,1209	0,0857
<i>exam2</i>	-0,0927 **	0,0422
<i>exam3</i>	-0,1008 *	0,0588
<i>exam0</i>	-0,0823	0,0695
<i>repeat2</i>	-0,1186	0,0895
<i>textbook_part</i>	-0,0542	0,0468
<i>textbook_none</i>	-0,0302	0,0756
<i>pages_wrong</i>	0,0229	0,0401
<i>optional_textbook</i>	-0,0359	0,0583
<i>laptop_usage</i>	-0,0322	0,0589
<i>Woman</i>	-0,0235	0,0397
<i>Language</i>	0,0062	0,0428
<i>preparation<1</i>	0,0001	0,0630
<i>preparation1-2</i>	-0,0428	0,0508
<i>preparation2-3</i>	-0,1432 **	0,0580
<i>preparation4+</i>	-0,0151	0,0537
<i>exam_prep0-3</i>	0,1835 ***	0,0645
<i>exam_prep4-6</i>	0,1045 ***	0,0405
<i>exam_prep14+</i>	-0,0614	0,0767
<i>study_electronic</i>	0,0978	0,0738
<i>study_print</i>	0,0857 *	0,0461
<i>study_different</i>	0,1414 ***	0,0473
<i>informatics_field</i>	-0,0564	0,0700
<i>banking_field</i>	-0,0933 **	0,0405
Chi-square (31)		88,4385
Log-likelihood		-467,9404

Schwarz criterion	1230,8470
P -value	3,44E-07
Akaik criterion	1003,8810
Hannan-Quinn criterion	1052,1670

^a Calculated with Gretl version 2015d

^b Statistical significance at the 0.01/0.05/0.1 level is denoted by ***/**/*

^c Data were obtained via questionnaire (252 observations)

From the results of our analysis it can be stated that students were absent 1-2 times a semester achieved 13.25 % less midterm points on average than students without an absence; students with 3 or 4 absences scored about 16.71 % lower on average in the midterm than students who were never absent; and students with 5-6 absences achieved on average 26.26 % less midterm points than students without an absence. From these results we can deduce the importance of lecture content, and maybe the role of lector, way of presentation and other factors.

The regularity of independent study during the course is also one of the statistically significant determinants of students' success. Students who devoted 2 - 3 hours a week to independent study achieved 14.32 % less midterm points on average than students who devoted 3 – 4 hours a week to independent study, so we can indicate its positive effect on student's success.

If a student declared a plan of 0 - 3 days of preparation for the final test, their midterm test score was about 18.35 % higher on average than the midterm test scores of students with a plan of 7 - 14 days of preparation for the final test. Similarly, if a student declared a plan of 4 - 6 days of preparation for the final test, their midterm test score was about 10.45 % higher on average than the midterm test scores of students with a plan of 7 - 14 days of preparation for the final test. We can deduce that students with better midterm results have already taken this course (or know the key issues of this subject from another course) and don't need to prepare as much for the final test. Or they have been studying continually for this course and they don't need more time for to prepare for the final test. Or maybe it works only on the assumption of such student's optimizing their behavior based on the negative relationship between the midterm test score and the final test score. In other words, if the student achieves a high midterm test score, he can predict and assume that it will be easy to be finally successful in the whole course with fewer points achieved from the final test, and therefore he doesn't need to prepare as much.

We can apply similar ways of thinking to the time of final test administration. If students have registered for the final test to be administered in the second week, their midterm test score is about 9.27 % lower on average in comparison with students who have registered for the final test administered in the first week. The same comparison can be

made in the case of students registered for the final test to be administered in the third week, whose midterm test score is about 10.08 % lower on average.

Students who are used to preparing for the final test only by reading study materials in printed form achieved 8.57 % more midterm points on average than students preparing by reading study materials in any form and rewriting them on paper. Students, who responded, that they are used to preparing for the final test with another method, mostly by reading study materials in printed and electronic form together, achieved 14.14 % more midterm points on average than students preparing by reading study materials in any form and rewriting them on paper.

The last statistically significant variable is the field of study. According to the results, the midterm test scores of students in Banking is about 9.33 % lower on average in comparison with students in Applied informatics.

4. Conclusion

Our research tries to identify the key determinants of students' success in basic economics courses taught by the Department of Economics at the University of Economics in Prague in the Czech Republic. In comparison to existing papers and research, our approach adds to the set of variables the IT technologies that students might use during lectures and studying.

We obtained the data during the last lecture in the winter semesters of 2016/17 and 2017/18 via a questionnaire to which 107 students responded in the first year and 145 students responded in the following year. In total we obtained 252 responses. Using quantitative methods, we try to quantify the effects of variables on students' midterm test scores. The estimations of interval regression identify as statistically significant: absence from lectures, the regularity of independent study during the course, planned time of preparation for the final test, the time of final test administration, the method of preparing for the final test and the field of study.

The effects of the use of IT technologies were identified as statistically insignificant. Of course, we are aware of the limited robustness of our findings with regard to the count of observations and the results of our analysis are rather preliminary. That's why we want to continue in our research to get more students' responses and also to include other variables in the model, such as semester of study (Anderson et al., 1994).

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