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Original Paper

Long-term trends in interest in studying at the Faculty of Economics and Management of the Slovak University of Agriculture in Nitra

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ABSTRACT

In this article, we examine trends in the number of students studying at the Faculty of Economics and Management (FEM) of the Slovak University of Agriculture (SUA) in Nitra between 2015 and 2024. FEM has the highest number of students at the university, including foreign students, making it one of its largest faculties. In our analysis, we focused on the admission process and enrollment of full-time students, the total number of students at the faculty, as well as the development of the number of enrolled students and graduates at the bachelor's and engineering's levels of study. We obtained data on student numbers from the Annual Reports on the Activities of SPU in Nitra for the years 2015 to 2024. In most cases, we observed a downward trend, with the exception of the number of applicants for first-cycle studies, where a slight reversal began to emerge in 2022. This development was subsequently reflected in the total number of students at FEM, with an increase only becoming apparent in 2024.

KEYWORDS*:* regression and correlation analysis, trend analysis, indices

JEL CLASSIFICATION: C02, C11, I210

INTRODUCTION

Slovak University of Agriculture in Nitra offers a three-level flexible university education based on the ECTS credit system with the aim of preparing graduates in all three levels of university study. SPU was the first university in the Slovak Republic to adopt this system of study with credit assessment of subjects in accordance with the principles of the European

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Credit Transfer System (ECTS) in 2001. This allows students to complete part of their studies at other universities abroad and receive credits for the subjects they have completed.

The Slovak University of Agriculture in Nitra consists of six faculties, including the Faculty of Economics and Management. On October 17, 2024, it celebrated the 65th anniversary of its founding. The faculty is divided into five departments: the Department of Economics and Management, the Department of Economic Policy and Finance, the Department of Marketing, Trade, and Social Studies, the Department of Statistics, Operational Research and Mathematics and the Department of Accounting and Informatics. The mission of FEM is to educate, conduct research, and provide consulting in the field of economics and management with an emphasis on the development and needs of society as a whole. As part of the Slovak University of Agriculture, it also provides space for interdisciplinary solutions to economic and management problems specific to the food vertical, rural development, and related industries in the manufacturing, trade, and service sectors.

The Faculty of Economics and Management at SUA in Nitra is one of the largest faculties at the university in terms of student numbers and also has the highest number of foreign students. This is further proof of its good reputation not only at home but also internationally. The faculty provides high-quality economic and management education within accredited study programs at all three levels of study. At the bachelor's level, it offers study programs in both Slovak and English. In Slovak, these are Business Economics, Business Management, Business Entrepreneurship, Accounting, Applied Economics and Data Analysis. The study programs International Business with Agrarian Commodities and Business Management are taught in English and also in a combined form. At the engineering level, Business Economics, Business Management, Agricultural Trade and Marketing, and Quantitative Methods in Economics are offered in Slovak. Business Economics and International Economics and Development are offered in English and in a combined form.

FEM also actively cooperates with foreign universities. Based on contractual cooperation in the field of international mobility programs and obtaining double degrees, the faculty offers this study option within the Business Economics program in cooperation with the Faculty of Agriculture and Economics of the Agricultural University in Krakow, where, in addition to the contractual mobility program and the possibility of obtaining two diplomas, the faculty also has an accredited joint diploma, "International Master in Business Economics." Another significant opportunity is the possibility to study the International Economics and Development program in cooperation with Middlesex University in London and obtain, in addition to an engineering degree, an MSc. from the prestigious London university.

In Slovakia, including SUA, a significant decline in the number of students after completing the first and second years of study has been observed for a long time. Gardner (2024) in the article Student numbers set to drop – and then rise in next decade writes: „Education ministers in Germany’s federal states are reckoning with a major increase in the number of students over the coming decade, although that number is first of all set to dip.“ The Australian Government Department of Education [1] writes in its report Key findings from the 2023 Higher Education Student Statistics on the page Trends in higher education student enrolment: „The number of students enrolled in Higher Education has been in a state of flux in recent years due to instability caused by the pandemic. In 2022, both commencing and total domestic student numbers decreased following the pandemic related peak. This decline extended into 2023, though softened slightly. The decline in domestic student numbers may

reflect the high cost of living in 2023 as well as strong labour market conditions. Given the volatility, caution should be used when interpreting short term trends“. Dorn at al. (2020) states in Article Higher education enrollment: Inevitable decline or online opportunity? that Declines in fertility and dropping international student numbers threaten the future of many higher education institutions, but others are prospering as they adapt to serve a more diverse and adult student base, increasingly online. The MIGRATIONDATAPORTAL (2024) states that The numbers of internationally mobile students are increasing and destinations diversifying. In 2022, there were an estimated 6.9 million international students globally, a 176 per cent increase over the past two decades, from 2.5 million in 2002. The international education company ICEF (2025) provides the following statistics: The latest figures from UNESCO indicate continued strong growth in higher education enrolments globally. From the year 2000, the global enrolment in higher education expanded by a factor of 2.5 times to reach 264 million students as of 2023. As a percentage of total higher education enrolment worldwide, the proportion of international students rose from 2.1% in 2000 to 2.7% in 2022.

MATERIAL AND METHODS

The analysis of trends in the number of students at FEM SUA in Nitra is based on data from the Annual Reports on SPU Activities for 2015 to 2024 ([7] - [16]). We compiled tables from this data and then processed them using Excel. We also used Excel to generate graphical outputs of the data.

Regression and correlation analysis, or correlation coefficient, is used to identify and mathematically express the statistical dependence of student numbers over time. We used the following regression models in our analysis: linear and polynomial functions of the 2nd and 3rd degree, which have the general form:

$$y_j' = b_0 + b_1.x_j,$$
$$y_j' = b_0 + b_1.x_j + b_2.x_j^2,$$
$$y_j' = b_0 + b_1.x_j + b_2.x_j^2 + b_3.x_j^3.$$

If the independent variable is a time variable, we adjust the general equations to the form:

$$y_j' = b_0 + b_1.t_j,$$
$$y_j' = b_0 + b_1.t_j + b_2.t_j^2,$$
$$y_j' = b_0 + b_1.t_j + b_2.t_j^2 + b_3.t_j^3.$$

The extent to which the selected regression function can explain the variability of the dependent variable is expressed by a ratio known as the coefficient of determination I^2(labeled R^2 in graphical outputs):

$$I^2 = \frac{V}{C} = \frac{\sum_{j=1}^{n}(y_j' - \bar{y})^2}{\sum_{j=1}^{n}(y_j - \bar{y})^2}.$$

The index can also be expressed as:

$$I^2 = \frac{C-N}{C} = 1 - \frac{N}{C} = 1 - \frac{\sum_{j=1}^{n}(y_j - y_j')^2}{\sum_{j=1}^{n}(y_j - \bar{y})^2}.$$

The coefficient of determination can take values from 0 to 1; the closer the value of the coefficient is to 1, the greater the proportion of the total variability explained by the model. In practice, the coefficient of determination is often used as one of the key criteria in selecting the most appropriate form of the regression function (Obtulovič, 2002).

RESULTS AND DISCUSSION

The admission procedure for applicants for the given academic years was carried out at all faculties of the university in accordance with the Higher Education Act. The conditions and rules of the admission procedure were approved by the study program committees and discussed by the Council for the Internal Quality Assurance System of Education at SUA. The organizational guidelines, content focus, and criteria for the admission of applicants were approved at all faculties by the academic bodies of the faculties, the deans' councils, and the academic senates of the faculties. The conditions for admission to bachelor's, master's, and doctoral study programs were published two months before the deadline for submitting applications. Applicants submitted their applications electronically. The admission procedure at the Faculty of Economics and Management was conducted in person. Applicants for first degree full-time study were admitted based on meeting the basic conditions for admission approved by the faculty's academic senate. The admission procedure was conducted in accordance with the applicable legal regulations.

Table 1 contains data for the years 2015 to 2024 concerning the first degree (bachelor's) full-time study at the Faculty of Economics and Management. It includes the planned number of students, the number of applications submitted, participation in the admission procedure, the number of applicants accepted, and the number of students who enrolled.

Table 1 Admission procedure for the first degree of study at FEM in 2015 to 2024 - full-time form

YEAR	Planned number	Number of applications	Participation	Acceptance	Registration
2015	600	1177	1000	916	632
2016	590	1094	920	875	560
2017	680	817	711	711	466
2018	680	887	758	758	479
2019	710	789	667	664	423
2020	750	659	658	658	402
2021	560	534	526	526	317
2022	480	644	534	482	283
2023	460	745	658	600	362
2024	440	873	742	677	461

Source: own

As illustrated in Figure 1, the number of applications declined until 2021 (a decrease of 54.63%), followed by a gradual increase over the next three years. The number of enrolled students declined until 2022 (a decrease of 55.22%), but in recent years, the number of enrolled students has been increasing.

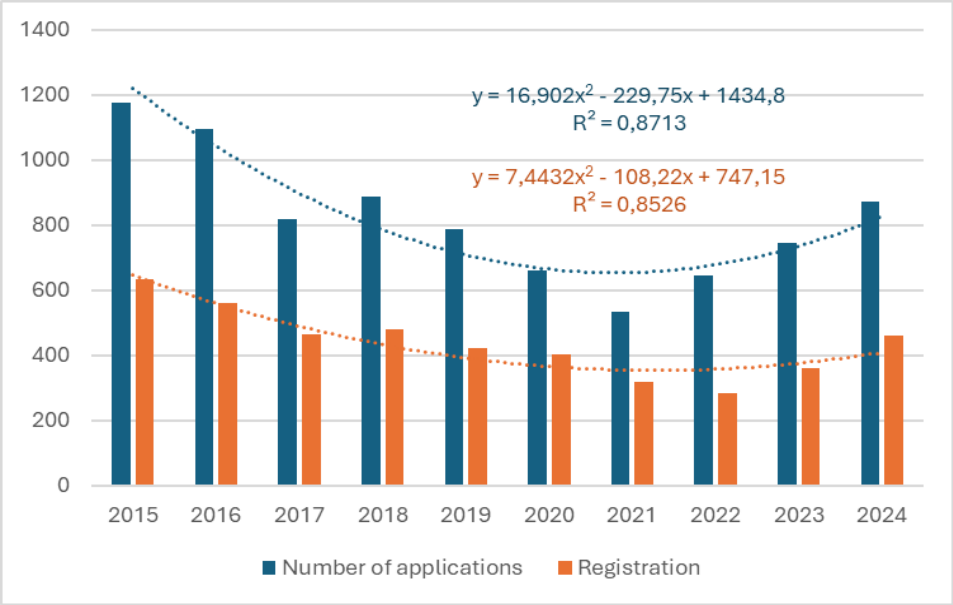

Figure 1 Number of applicants and enrolled full-time students in the first cycle of study at FEM
Source: own

We have also included trend curves expressed by a second-degree polynomial together with the values of the coefficients of determination R2 in the graphical presentation.

Table 2 Admission procedure for the second level of study at FEM in 2015 to 2024 - full-time form

YEAR	Planned number	Number of applications	Participation	Acceptance	Registration
2015	505	485	481	475	417
2016	580	467	466	456	411
2017	660	421	421	412	384
2018	720	445	442	442	395
2019	680	411	411	407	374
2020	625	326	326	321	303
2021	510	288	278	278	262
2022	490	276	262	261	238
2023	490	260	258	258	221
2024	490	231	211	207	194

Source: own

The value in both cases (number of applications R2 = 0.8713, number of enrolled students R2 = 0.8526) indicates a suitably chosen model to describe the trend, where in the first case the chosen regression model explains 87.13% of the variability in the number of applications, and in the second case the model explains 85.26% of the variability in the number of enrolled students.

Table 2 contains the same types of data as Table 1, but they refer to the second degree (engineering) studies at the Faculty of Economics and Management in full-time form. Figure 2 shows a downward trend in the number of applications submitted and enrolments for this level of study during the period under review, with a slight increase recorded in 2018. Over the entire period, there was a 52.37% decline in applications submitted to FEM. The selected regression model explains 96.09% of the variability in applications submitted. The number of enrolments fell by 53.48% in 2024 compared to 2015, with the model explaining 97.54% of the variability in enrolled students.

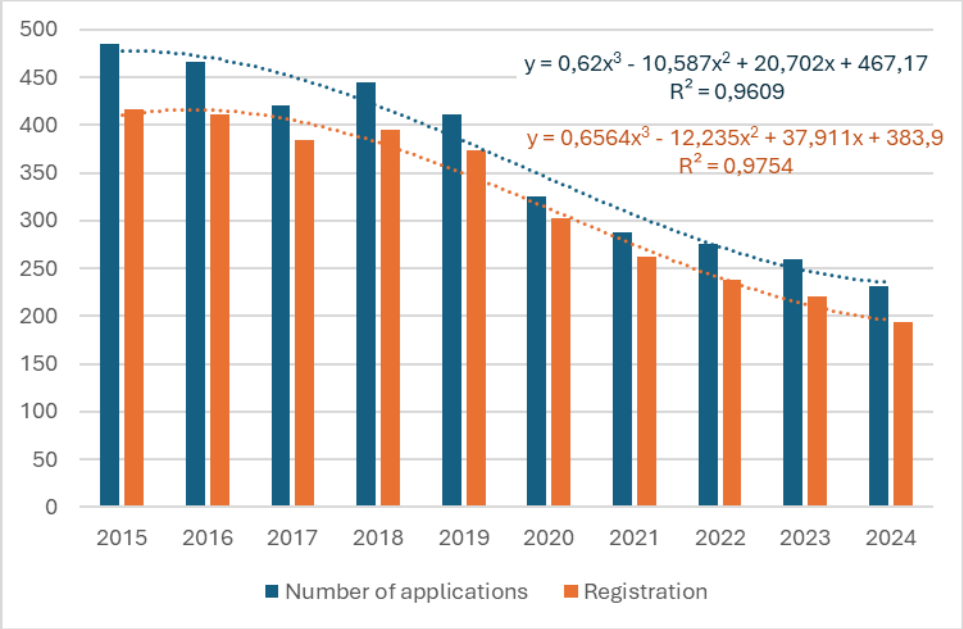

Figure 2 The number of applicants and enrolled students in full-time study in the seconds level at the FEM
Source: own

One of the faculty's priority activities is education and training. Further improvement in this area depends on the thorough evaluation of the results achieved. The quality of the educational process has a significant impact on quantitative indicators, i.e., the number of students who continue their studies in higher years and do not drop out prematurely due to dissatisfaction with the quality of education. As we observe at SPU, but also at other universities in Slovakia, there has been a high dropout rate among students after the first or second year of study for a long time. Table 3 contains information on the total number of students of the Faculty of Economics and Management who studied at the first and second levels of study in the given years.

During the monitored period, there was a 32.36% decline in the number of students enrolled in the first cycle of study at FEM and a 44.04% decline in the second cycle. One of the main

factors influencing the decline in the number of students in bachelor's degree programs is long-term demographic trends, in particular the declining number of secondary school graduates as a result of lower birth rates in previous decades. This phenomenon has a significant impact on all universities in Slovakia, including the Faculty of Economics and Management. Another important aspect is the change in the preferences of applicants, who are increasingly inclined towards technical, IT, or practically oriented fields, which they consider to be more promising in terms of employment prospects. In addition, competition between universities is increasing, including offers from private universities and foreign universities, which attract students with more appealing study programs, modern approaches to teaching, and higher-quality facilities. Every year, many Slovak students leave to study mainly in the Czech Republic, but also in other European Union countries. Finally, the changing perception of the value of a university degree also plays a role – some young people prefer to acquire practical skills through courses, certifications, or internships, perceiving university studies as less effective or unnecessarily lengthy. These factors together contribute to a decline in interest in bachelor's studies, which is reflected not only in a lower number of applications, but also in a smaller number of enrolled students and, consequently, those who study. The decline in the number of students at the Faculty of Economics and Management is evident not only at the bachelor's level, but also at the master's level. As with the first degree, demographic developments, the declining number of first-degree graduates, and a generally lower interest in continuing to higher education play a significant role in this case. Many bachelor's degree graduates decide to enter the labour market directly after graduation, especially if they can obtain a job without higher education. This trend is also supported by the practice of many employers, who are increasingly less likely to require an engineering degree as a condition of employment. Another factor is the growing interest in alternative forms of education that enable students to acquire specialized knowledge and skills in a shorter period, often in the form of online courses or professional certifications. For some students, continuing their studies is also associated with a financial or time burden, which may lead to a decision not to continue to the second level. Competition from other universities that may offer programs with a higher degree of practical relevance, international accreditation, or the possibility of studying in a foreign language also has an impact. These circumstances together create an environment in which maintaining a stable number of students at the second level is a challenge.

Table 3 Total number of FEM students in full-time study for the given years

Level of study	YEAR									
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
I.	1239	1226	1160	1062	933	885	830	738	730	838
II.	654	668	608	609	629	565	479	432	397	366
I.+II.	1893	1894	1768	1671	1562	1450	1309	1170	1127	1204

Source: own

As shown in Figure 3, the number of students enrolled in first-cycle studies has been declining since 2015 up to 2023. An increase of 108 students, i.e. 14.8% more than in the previous year, was recorded only in the last year under review. At the second level of study, there has been a relatively large decline in the number of students since 2019. In 2024, compared to 2015, this represents a decline of up to 44%. The total number of students

studying at FEM (first and second levels combined) logically stopped in the last monitored year 2024, which was influenced by the number of students in the first level of study (the decline in the final monitored year compared to the first base year was 36.39%). In all cases, the ex-post analysis was performed using a third-degree polynomial function. The determination indices indicate the suitability of the selected regression models, with their values very close to 1.

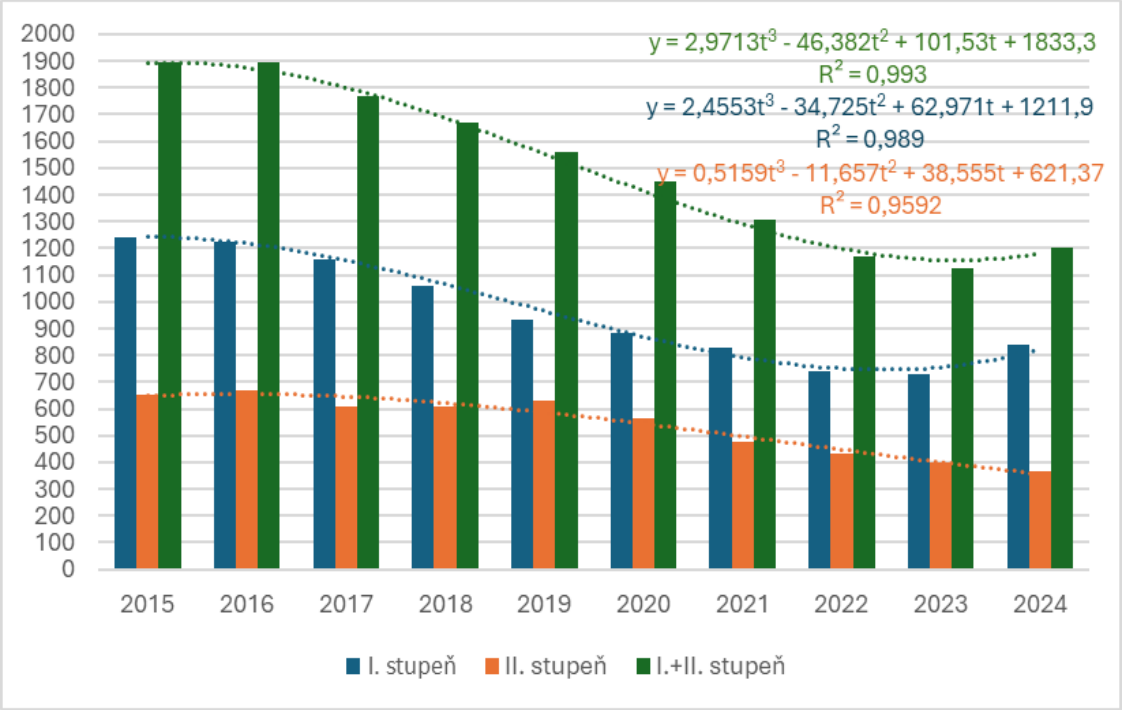

Figure 3 Number of FEM students in full-time study at the first and second levels and both levels combined
Source: own

Table 4 provides an overview of the number of enrolled students, the number of graduates, and the number of those who did not complete their studies at individual levels. The data was processed based on the expected length of study – bachelor's studies typically last three years, so students enrolled in 2015, for example, are considered potential graduates in 2018. Similarly, for the engineering (II) level, which lasts two years, we have assigned an expected graduation date of 2018 to students enrolled in 2016. The data also includes students who extended their studies for various reasons – most often because of repeating a year, interrupting their studies, or following an individual study plan. Since detailed data on the length of study of individual people was not available, it is not possible to separate these cases precisely. Therefore, the values for the number of uncompleted studies are only indicative and may also include students who completed their studies later than expected based on the standard length of study.

Table 4 Enrolled students, graduates, and students who have not completed their studies in the first and second cycles of full-time study at FEM

Level of study	**YEARs**	**2015/ 2018**	**2016/ 2019**	**2017/ 2020**	**2018/ 2021**	**2019/ 2022**	**2020/ 2023**	**2021/ 2024**
I.	Enrolled	632	560	466	479	423	402	317
	Graduates	353	325	279	238	227	219	199
	Not finished	279 46.99%	235 41.96%	187 40.13%	241 50.31%	196 46.34%	183 45.52%	118 37.24%
	ROKY	**2016/ 2018**	**2017/ 2019**	**2018/ 2020**	**2019/ 2021**	**2020/ 2022**	**2021/ 2023**	**2022/ 2024**
II.	Enrolled	411	384	395	374	303	262	238
	Graduates	327	263	311	298	241	215	181
	Not finished	84 20.44%	121 31.51%	84 21.27%	76 20.32%	62 20.46%	47 17.94%	57 23.95%
I. + II.	**ROKY**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
	Graduates	680	588	590	536	468	434	380

Source: own

As shown in Table 4 and subsequently in the graph in Figure 4, the number of students enrolled in the first cycle of study shows an overall downward trend, with a slight exception in 2018. The decline is even more pronounced in the number of graduates, where it is evident throughout the entire period under review. However, the number of students who did not complete their studies is particularly noteworthy – in most years, this represents approximately half of the enrolled students, which is an alarming figure. A more significant positive change in this proportion was observed only in the last year monitored. A parabola was used in the analysis of enrolled students and graduates at the bachelor's level (equations are shown in Figure 4), with the explained variability by the selected regression function confirming the suitability of the model used in both cases (the values of the coefficient of determination are shown in Figure 4). To describe the analysis of the trend of non-graduating students, we chose a third-degree polynomial (the equation and R2 are shown in Figure 4).

A long-term downward trend in the number of enrolled students can also be observed at the second level of study. This development is also reflected in the number of graduates, which is gradually declining in line with the lower number of students entering engineering studies, as illustrated in Figure 5. From an analytical point of view, the proportion of students who did not complete their second-cycle studies also deserves special attention. As Table 4 shows, this is a significant number, which in some years represents a significant proportion of those enrolled. This phenomenon may signal problems related either to students' motivation to continue their studies, the difficulty of the studies, or external factors such as job opportunities or financial reasons. In any case, this is a trend that requires deeper analysis and attention from the faculty.

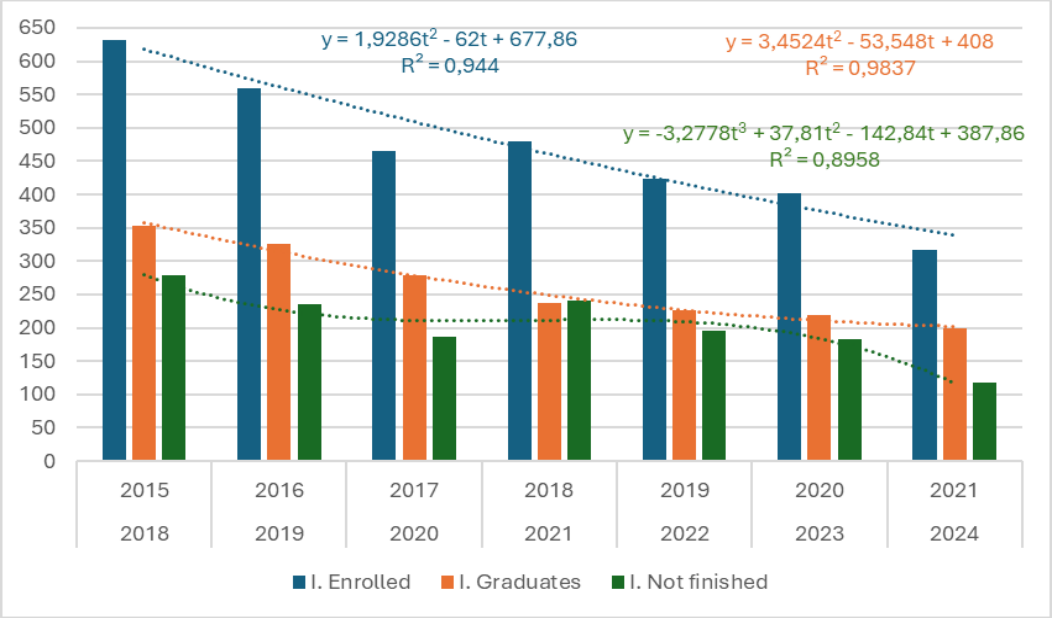

Figure 4 Enrolled students, graduates, and students who have not completed their first-cycle studies at FEM
Source: own

For students enrolled in the second cycle of study, a parabola was used, whose equation and index of explained variability (R2 = 0.9494) are shown in Figure 5. A linear function describing 76.05% of the explained variability (Figure 5) was used to describe the trend of graduates who completed their studies. The trend of students who did not complete their studies is described by a third-degree polynomial (Figure 5).

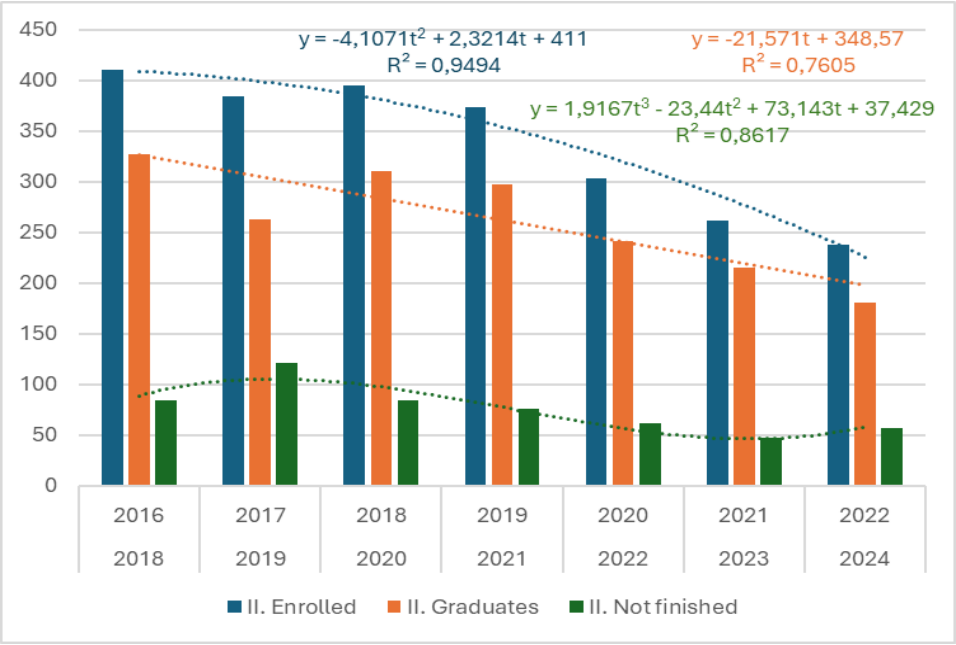

Figure 5 Enrolled students, graduates, and non-graduates of full-time second-cycle studies at FEM
Source: own

Figure 6 shows the total number of graduates from the Faculty of Economics and Management, including both bachelor's and engineering degree students, supplemented by the trend line equation and the determination index value.

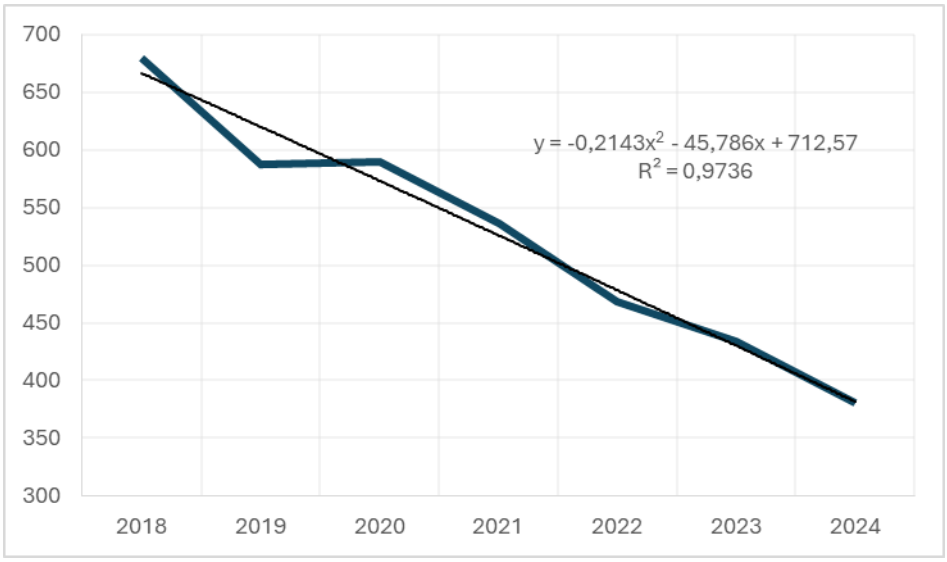

Figure 6 BAC and ENG degree graduates together at FEM
Source: own

The graph shows a significant downward trend, which can be considered alarming. For example, in 2024, the number of FEM graduates reached only slightly more than 44.1% of the 2018 figure. These figures point to a long-term decline in the number of students who successfully complete their studies, which may have a negative impact not only on the faculty but also on the broader academic and professional context in the field of economics and management.

CONCLUSIONS

In the article, we analyzed trends in the number of students studying full-time at two levels of study: bachelor's and engineering at the Faculty of Economics and Management of the Slovak University of Agriculture in Nitra for the years 2015 to 2024. We examined how the numbers of registered and enrolled students, the total number of students and the number of graduates at a given faculty changed. The numbers of registered and enrolled students at the first level (bachelor's) of study have been increasing slightly over the last 2-3 years, but at the second level (engineering) there has been a permanent decline. The decline in the number of graduates at both levels of study has not stopped yet. The long-term decline in the number of graduates of the Faculty of Economics and Management is also interesting. This represents a serious signal for its future development and competitiveness. A low graduation rate, especially at the bachelor's level, may indicate problems in the areas of motivation, quality of the study process, accessibility of content, or external competition from other higher education institutions and foreign universities. The reduced number of graduates also means a smaller supply of qualified professionals into practice, which may have negative consequences in the long term for the region and the sector the faculty focuses on. At a time

when the labor market is facing a shortage of specialists in the fields of economics, management and agri-food, it is particularly important to ensure stable educational outcomes.

At the same time, broader demographic contexts cannot be ignored. In recent years, Slovakia has been facing a long-term decline in the number of young people of typical age for higher education, which is a consequence of the unfavorable development of the birth rate in previous years. This is directly reflected in a lower number of applicants for studies and ultimately graduates. This trend is not specific to FEM but affects most universities in Slovakia. Nevertheless, it is important for the faculty to actively respond to this situation, because in a smaller population of applicants, it will be increasingly important to impress with the quality and offer of studies. The reduction in the number of graduates should not be just a statistical indicator, but a challenge for comprehensive modernization and better targeting of the educational process to the needs of both students and society.

CONFLICT OF INTEREST

The authors declare no conflict of interests or competing interests.

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