

QUANTITATIVE POPULATION ANALYSIS AS THE FACTOR OF THE QUALITATIVE EVOLUTION OF THE HIGHER EDUCATION

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Abstract

In 2003 there was a break in decreasing trend in Slovak natality, when the first time since 1980 more children were born than in the previous year. The natural increase in the number of potential applicants for university education in Slovakia will manifest explicitly itself from demographic perspective in academic year 2022/2023. Real quantitative higher education evolution does not respond to the demographic movements. While in 1989 17% or less people from among the 19-year-old population entered the first-year-class of college or university, in 2008 first-year-class students in higher education formed more than 50% share of the 19-year-old Slovaks.

With regard to the mentioned demographic assumptions we can look into the past, current and future development of number and composition of students studying at Slovak higher education institutions as a contributory factor in the development of measured quality in Slovak higher education system.

Key words: educational system quality, education, demographic evolution,

JEL Code: I210, J110, J240

Introduction

The theme of the educational system quality increasing is a very actual theme discussed and solved at all social and professional levels up to highest national law making positions. At present the power influencing human future is ascribed to education and its quality. Today's trends in education reflect efforts not only to improve the quality of education, but the situation is accompanied by the increasing number of educational institutions, training courses, programs and students.

Below the quantitative evolution and its forecast of Slovakia's 19-year-old population from a demographic point of view is presented as well as the parallel evolution of the

population of university students. Their relationship can be considered factor of the qualitative routing of the system of higher education.

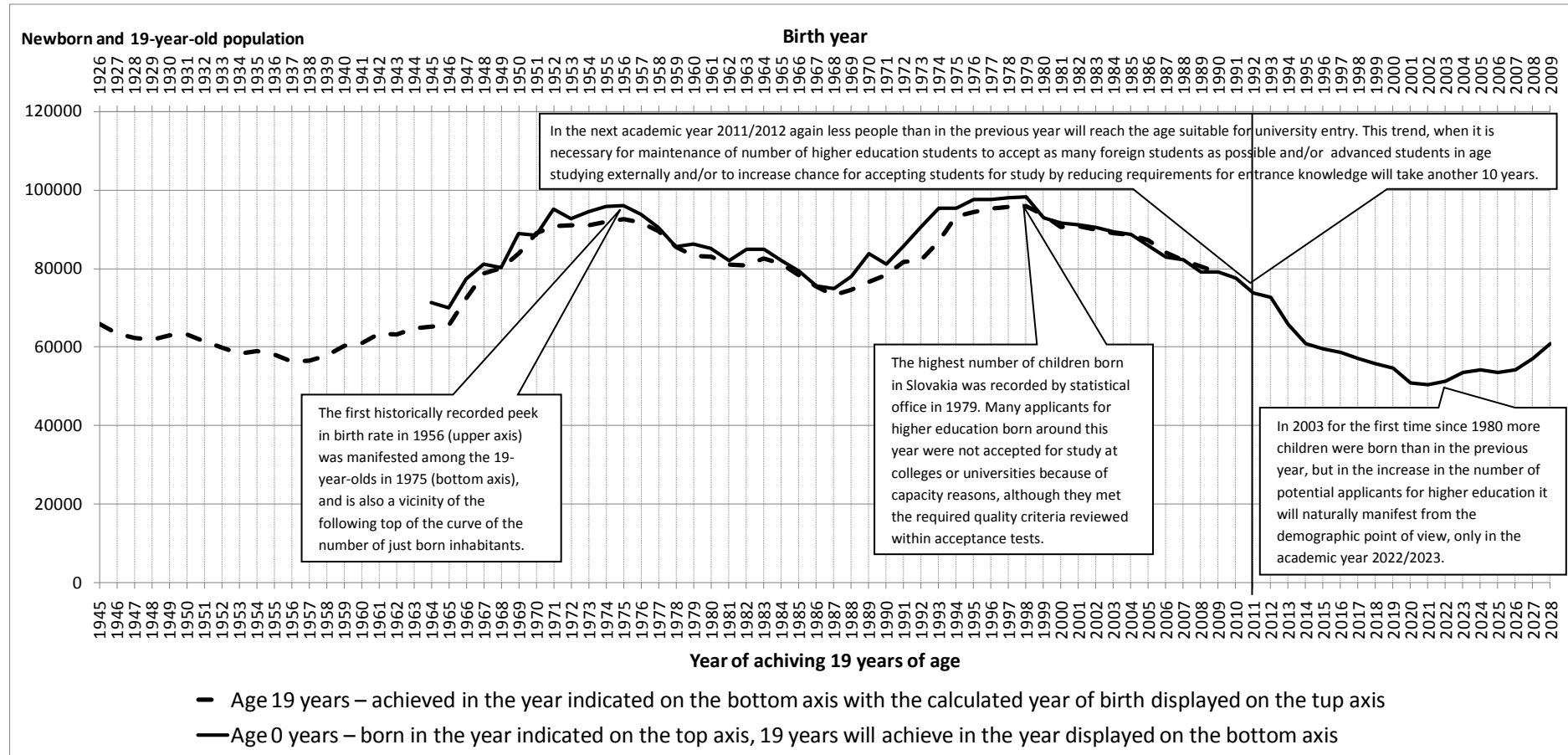
1 Evolution and forecast of nineteen-year-old population as the inherent factor of the evolution of number of newly accepted university students

In Slovakia students usually enter college or university immediately after graduating high school at the age of nineteen. Considerations of a shorter variant of compulsory education before 1990, and deferred school attendance, are irrelevant in the alleged study because of the negligible effect on the accuracy of the evolution and significant only indication of the demonstration of the trend of population quantitative evolution as a basis for number of potential students.

Status of the population of age 0 years and 19 years in Slovakia is recorded by Slovak Statistical Office (Slovstat) since 1945. Studied two groups of population (born and 19-year-olds) are in the presented diagram (Fig. 1) shifted to each other so at the imaginary vertical line intersecting the two time series of population are in the diagram shown the same people. On one curve there are shown people as just born and at the other as 19-year-olds. From the middle of the diagram, therefore, we can ascertain that the number of 19-year-old habitants in some year is about the same as there was number of just born habitants nineteen years ago and, conversely, the number of children born in some year is more or less identical with the number of 19-year-old habitants in 19 years later. Existing differences between curves that are displayed as non-overlapping of the curves are caused by mortality and migration of population.

Moving the curve to each other in 19 years with the assumption that only a statistically insignificant proportion of the population mortality and migration have caused deviations in the size of the population, but the trend have not been intervened, the diagram of parallel curves have been extended only by solitary curves in two directions. On the left is hereby presented the birth date estimation of nineteen-year-old people actually recorded in the database and right side of diagram shows future development of nineteen-year-old people through the expectation that approximately the same number of current newborn residents will grow to the age of nineteen years and will be counted into the Slovak demographic database.

Fig. 1: Demographic overview of population, which presents a curve of the number of births and the second curve of 19-year-old population with shifted horizontal axes against each other within nineteen years.



Source of data: Slovstat, Eurostat

The highest number of children in Slovakia was born and recorded by statistical office in 1979. It was the strongest year from which after 18 years (for this generation was yet valid eight-year compulsory education in primary schools) have been not accepted all applicants for university studies for the capacity reasons, even after successful execution of the admission procedure, it means, even those who met the required quality criteria reviewed within acceptance tests. From the number of candidates those students were chosen who had qualitatively the greatest potential to contribute to economic and scientific benefits of higher education.

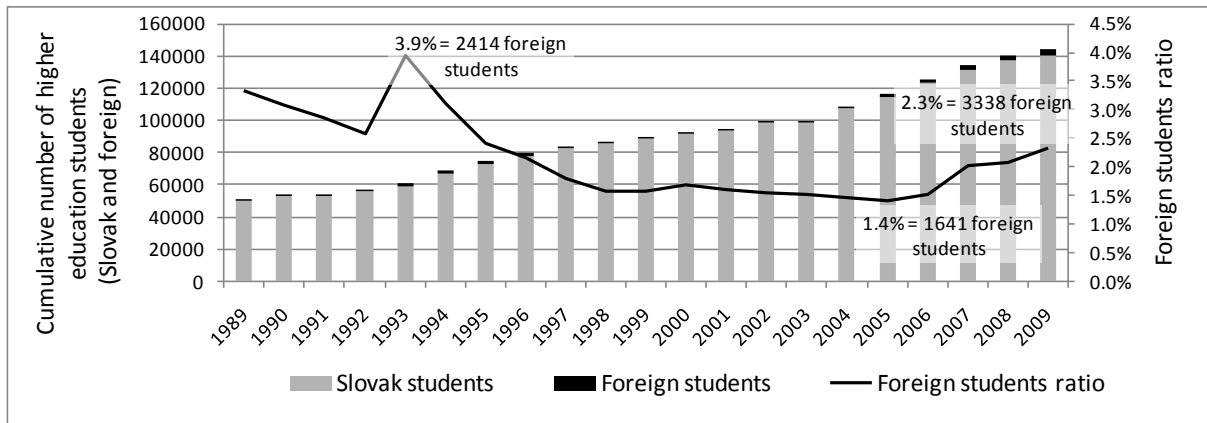
The following years after 1979 year on year the number of births has steadily declined, even during the expected positive growth, therefore, despite a sufficient number of young people in Slovakia growing up reproductive age. The first historically recorded peak in birth rate in 1956 (upper axis) was manifested among the 19-year-olds in 1975 (bottom axis), and is also a vicinity of the following top of the curve of the number of just born inhabitants. So the time of most numerous group of 19-year-old population with potentially most frequent interest in studying at university has also ensured an adequate number of born children.

Following this trend, according to the biological assumptions of the increase of the number of 19-year-old people, after the year-to-year decline in natality could again from 1989 be yearly born more children with the frequency peak of the birth rate after 2000. However, post-revolution environment supporting the growth of individualism and favoring life self-realization have altered the natality curve by postponement of fulfillment of family values and the expected growth of birth rate continued by its decline. This decrease lasted until 2003.

2 Quantitative evolution at the Slovak higher education institutions

Despite the demographic trends, when number of 19-year-old Slovaks year by year declines annually since 1999, continues to maintain and even increase the number of students admitted to higher education. Statistically, this number is increasing by accepting of foreign students (at a minimum rate so far) (Fig. 2), by its complementing with students born sooner, who have been generally unable to participate at academic activities in previous periods because of the knowledge or capacity reasons (Fig. 3), by possibly reducing claims on the current accepted students, or by multiple counting of students studying also at different university.

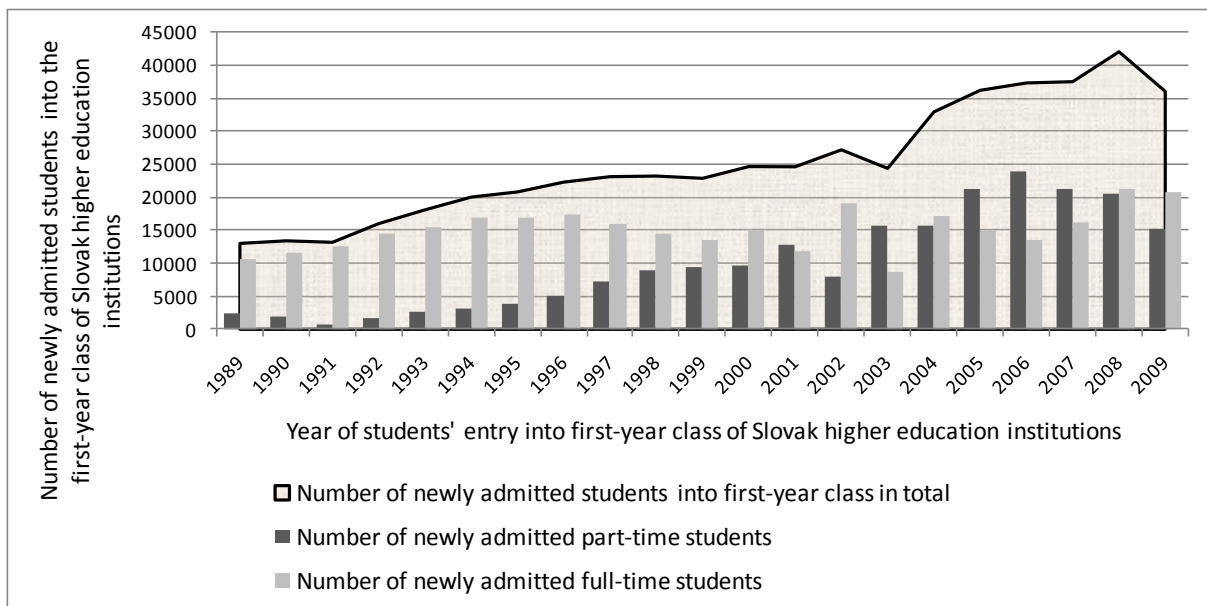
Fig. 2: Number of Slovak and foreign higher education students and the proportion of the foreign students



Source of data: Slovstat, Eurostat

Number of newly admitted students at all higher education institutions in Slovakia is increasing (Fig. 3) with more or less steady rate with an average of 5.23 percent in annual increase. The average annual increase in full-time student study form is 3.43%, so the total increase is mainly engaged by students with part-time study during the examined period on average by 9.7% annually.

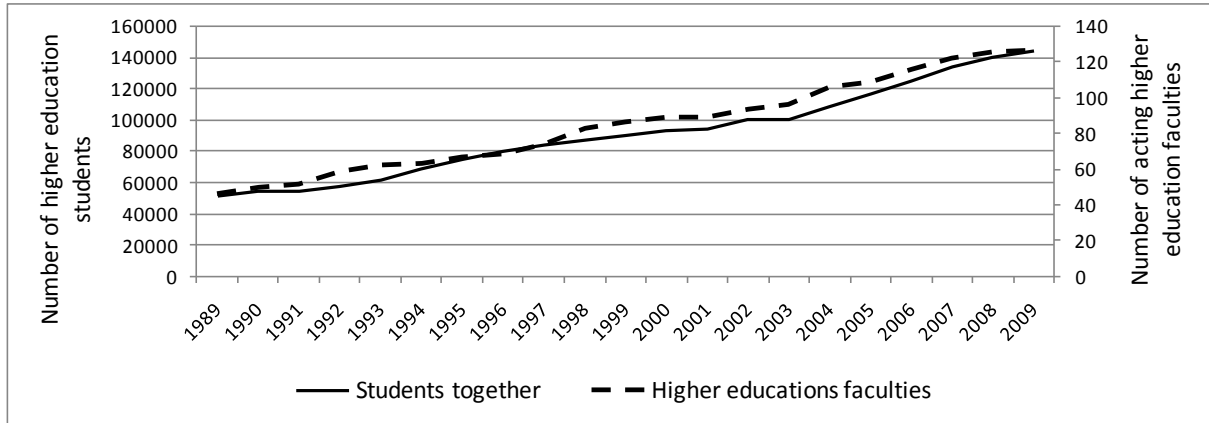
Fig. 3: Newly accepted students into the first-year class, full-time and part-time study individually and together.



Source of data: Slovstat, Eurostat

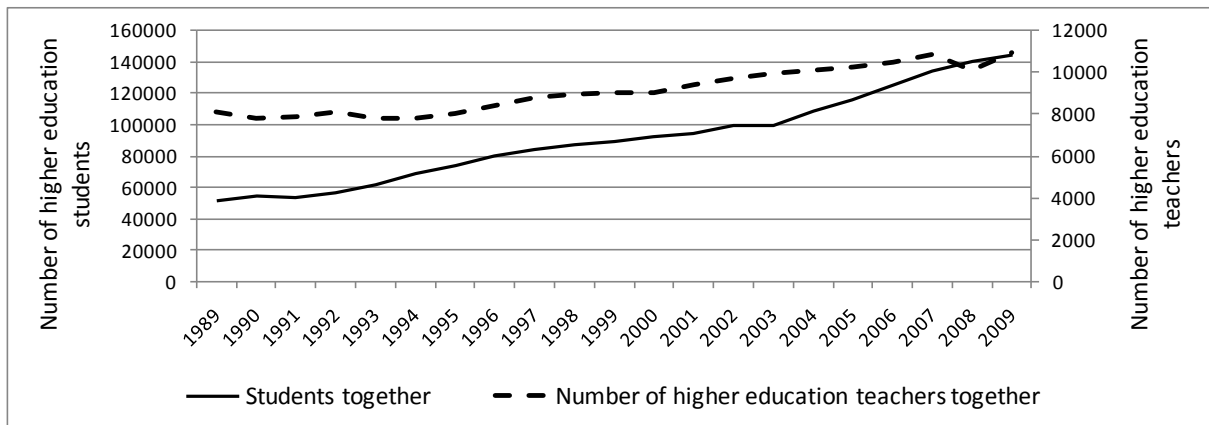
Proportional to the number of accepted students the number of faculties of colleges and universities is also growing in a given period (Figure 4), while the number of teachers is growing at a slower rate (Figure 5), therefore the proportion of students per teacher during the examined twenty years is growing and it has more than doubled (Figure 6).

Fig. 4: Trends of frequency of college and university students and of number of acting faculties



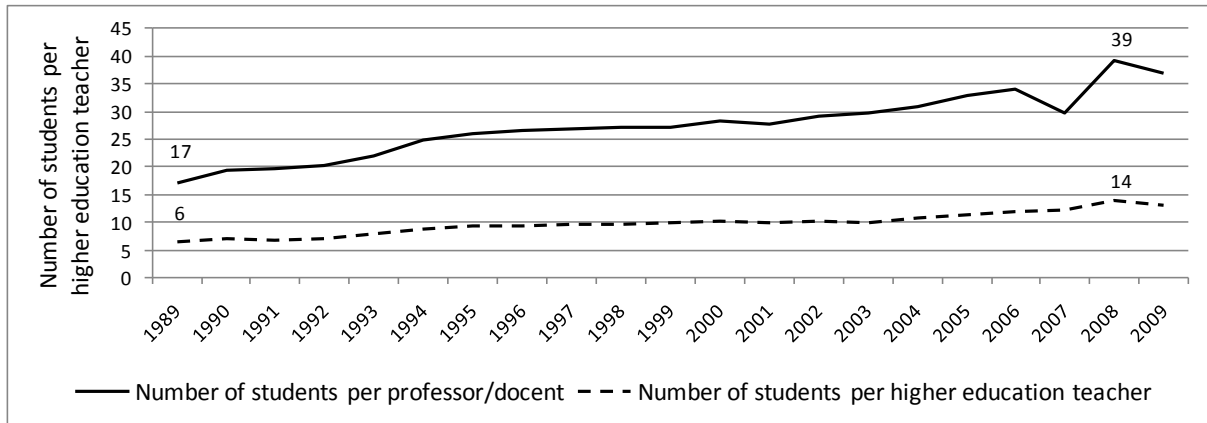
Source of data: Slovstat, Eurostat

Fig. 5: Trends of frequency of college and university students and of number of college and university teachers



Source of data: Slovstat, Eurostat

Fig. 6: Trends of numbers of higher education students per higher education teacher



Source of data: Slovstat, Eurostat

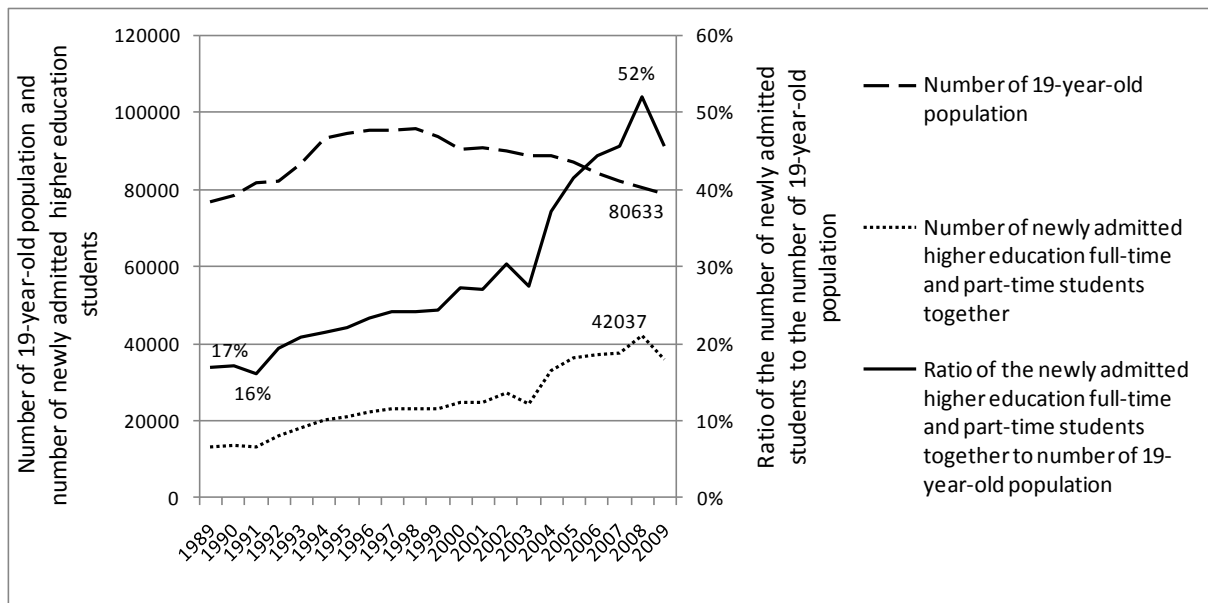
3 Quantitative evolution in higher education as a factor of the qualitative evolution in higher education

While in 1989 17% or less people (the actual ratio of 19-year-old Slovak population has been being decreased by counting in foreign university students, older students than 19 year-old entering higher education in the first year, students studying at more than one higher education institution) from among the 19-year-old population entered the first-year-class of college or university, in 2008 first-year-class students in higher education formed more than 50% share of the 19-year-old Slovaks. A small proportion of the share were foreign students (1-4%) and those who studied at two universities (unknown probably negligible share), substantial increase was caused by accepting the number of students studying part-time (Figure 5), in some years students studying part-time formed more than half of first-class students.

Not considering other circumstances affecting the quality in education we will also simplistically assume that the average level of accepted and understood knowledge of university students and teachers' opportunities is constant each year. According to assumption of normal distribution of capabilities and abilities of students and teachers at universities we can expect declining in the average quality of the results with the increasing proportion of higher education students in the population. By other words, while a smaller proportion of secondary school students with the best educational achievements and professional prerequisites for their successful use accepted to study at college or university have a certain quality level of skills and knowledge, taking additional high school students following the

best, i.e. weaker by performance, it will also cause reducing the overall average higher educational performance.

Fig. 7: Comparison of trends of annual Slovak 19-year-old population and of frequencies of newly accepted college and university students



Source of data: Slovstat, Eurostat

Conclusion

In the next academic year 2011/2012 again fewer people than in the previous academic year will reach the age suitable for entry to university, what is expected according to the evolution curve of births from the period of nineteen years ago without taking into account other factors than demographic-statistical. Demographically insufficient number of recent graduates of secondary schools as candidates for higher education, unfilled capacity of the schools and higher schools' funding needs can be currently artificially solved by potential reducing prerequisites for entrance exams, and by taking students for the part-time (external) form of study what will be ultimately reflected in the average by lower qualitative characteristics of Slovak higher education. Trend in accepting students into the first-year classes of higher education institutions indicating further increase the number of students in future years is not sustainable in a long time, because of the apparent decreasing number of secondary school students and exhaustibility of the high proportion of externally studying older age higher education students.

Finally we can say that in 2003 there was a break in the declining trend in Slovak natality. For the first time since 1980 more children were born than in the previous year, but in the increase in the number of potential applicants for higher education study it will naturally manifest from the demographic point of view, apart from external influences, only in the academic year 2022/2023. Until then, efforts to improve quality in higher education in Slovakia will be weakened by the natural distribution of level of attitude, skills and knowledge of the growing proportion of the population studying at colleges and universities and by possible increasing the teaching load of university teachers to the detriment of the qualitative scientific and qualifications development.

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