

Petr Mazouch  
Savina Finardi  
Jakub Fischer

## **Increasing Level of Education in Selected Central European Countries: a Certain Advantage<sup>1</sup>**

### **1. Introduction**

Increasing of the nation's level of education in any country is an indisputable positive fact. It is obvious that the nation's level of education has a strong impact on the other socio-economic indicators<sup>2</sup>. One of the basic indicators of the nation's level of education is the ratio of the tertiary-educated people. This indicator has two main advantages – it is very simple and comprehensible and it is in principle comparable among countries. Despite of some differences between educational systems in individual countries, the tertiary part of these systems is practically similar (in European area also in consequence of the Bologna Process).

While the ratio of tertiary-educated people is at a level of about 30% in advanced European countries (Belgium 31%, France 25%, Germany 25%, Netherlands 30%, United Kingdom 30%), in transitive countries the ratio is only at the level of about 15% (Czech Republic 13%, Hungary 17%, Poland 17%, Slovakia 14%). In the consequence of the Lisbon Strategy there is a pressure on increasing of the level of this indicator.

On the other hand, there is necessary to analyze the previous development of the ratio of tertiary-educated people in the advanced countries. The process of

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<sup>2</sup> E.g., relationship between education and gross value added is analysed in Fischer, Mazouch (2007a), relationship with unemployment rate is published in Mazouch, Fischer (2007a) and an influence of the education level on the life expectancy and the impact on the pension scheme is analysed in Mazouch, Fischer (2007b).

increasing of this ratio had been longstanding and gradual, and was influenced by gradually increasing number of students participating on the tertiary education. It has been also affected by the gradual “dying-cul” of the elder populations with lower education level (what is a natural process leading to a higher average level of education). There is a one common factor for these societies – demographic stability. These countries passed the so-called Second Demographic Revolution, but this process was very different (in contrary to the transitive countries it was much slower) – the consequences of the 2<sup>nd</sup> Demographic Revolution in transitive countries are and will be very strong (from the short-term point of view).

The aim of the paper is to analyze the situation in three transitive countries (The Czech Republic, Slovakia and Poland). What will happen due to the pressure on increasing of the nation’s level of education? What will cause the relation of this fact with the demographic trends in these countries?

## 2. Data and Methodology

It was necessary to find the data source which provides data comparable among analyzed countries. In all three countries the ISCED classification is used, but some statistical statements do not contain detailed data which are required for the analysis. As a main source we used the database of EUROSTAT<sup>3</sup>. We used the data on graduates and on the new enrolled students to tertiary education institutions (level ISCED 5) after a subtracting of graduates and enrolments to level ISCED 5a\_d2 (due to the elimination of duplicities – level ISCED 5a\_d2 contains study programmes following the previous bachelor’s programmes). As a supplementary data sources we used the data from Housing and Population Censuses in the Czech Republic (2001), Slovakia (2001) and Poland (2002) and also the demographic data (number of births) from these countries.

We compare the ratios of graduates with the number of births with a time lag of 22 years (this is an expert estimate of the average age of graduation of the tertiary education at a level ISCED 5 (excluding ISCED 5a\_d2). Number of births was adjusted by the 3-year simple moving average).

As the second step we made a prognosis of the ratio of graduates on time-lagged births. As an assumption we use the stability of the number of new enrolments in the next 3 years (for the Czech Republic according to the internal documents of the Ministry of Education, Youth and Sports of the Czech Republic, for the other states as our expert estimate). For the prognosis of the number

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<sup>3</sup> <http://ec.europa.eu/eurostat>

of graduates we use some coefficients for the time needed for graduation after enrolment (3 years 0.5; 4 years 0.45; 5 years 0.05) and we also computed the longitudinal “successful rate” of studies (graduates to enrolments ratio) as an average ratio from years 1998 – 2006. This ratio is 0.8 for CZ, 0.76 for SK and 0.67 for PL. The prognosis for next 7 years is made from the above mentioned assumptions, the prognosis for further years is made in two alternates – the first one (higher) assumes the constant number of students enrolled to the tertiary studies, the second one (lower) assumes the constant ratio of graduates to time-lagged births.

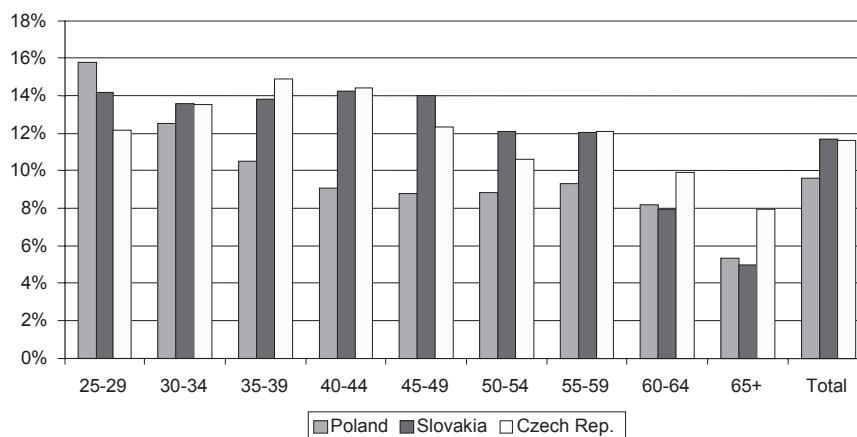
### **3. Results**

Firstly we can see the educational structure of the populations of the analyzed countries (chart 1). The educational structure is quite different between compared countries. While the total average ratio of tertiary-educated people is very similar in the Czech Republic and Slovakia (ca 12%), and in Poland it is quite lower (ca 10%), the countries are different from the point of view of the structure. We can see that Poland have chosen the way of very fast increase of the education level of the youngest population. It is necessary to say that the data on educational structure are from years 2001 and 2002 so they can be quite obsolete. On the other hand, it is very different to obtain the data on the educational structure from the other source than the Housing and Population Census. By the way, it contributes to justification of the necessity of the Census<sup>4</sup>.

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<sup>4</sup> See Fischer, Mazouch (2007b)

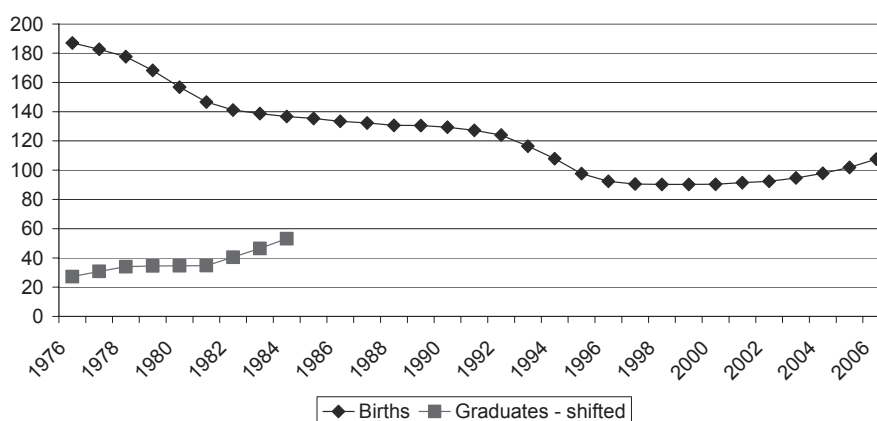
**Chart 1: Age-specific ratio of tertiary-educated  
(CZ, SK 2001, PL 2002)**



Source: Housing and Population Censuses in Czech Republic, Poland, Slovakia (2001, 2002).

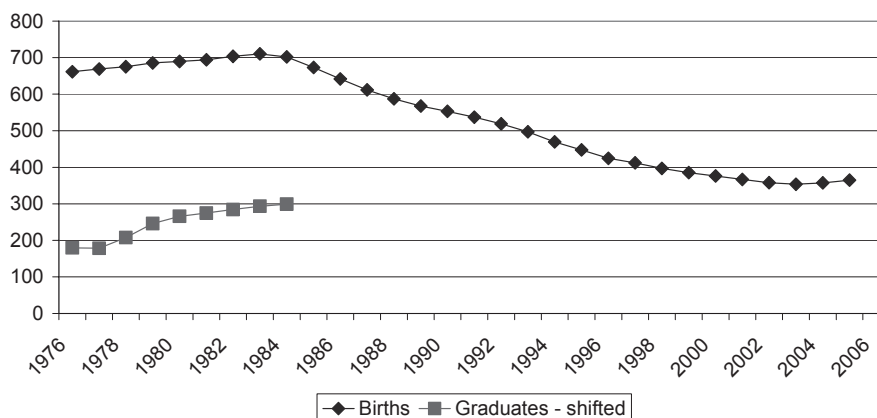
On the next three charts (chart 2 to chart 4) one can see the comparison of the number of births and the number of graduates. The data on graduates are shifted back (of 22 years) so we can compare the trends of births before 22 years and graduates now.

**Chart 2: Number of births and the graduates  
(with a 22-year shift)  
Czech Republic (in thousands)**



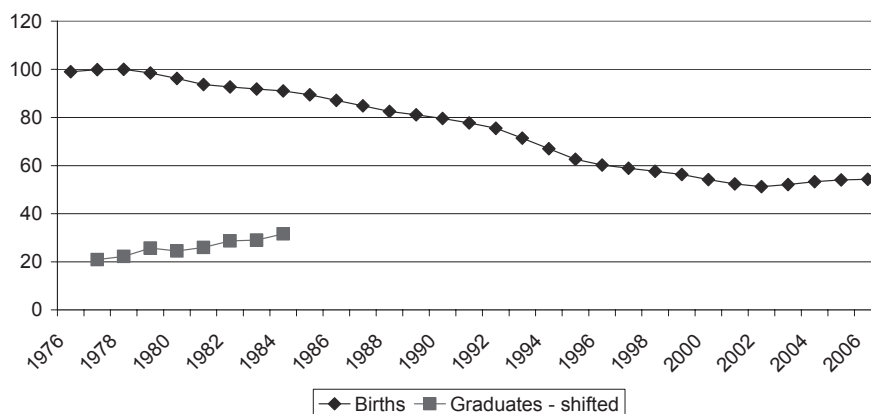
Source: EUROSTAT, demographic data.

**Chart 3: Number of births and the graduates  
(with a 22-year shift)  
Poland (in thousands)**



Source: EUROSTAT, demographic data

**Chart 4: Number of births and the graduates  
(with a 22-year shift)  
Slovakia (in thousands)**



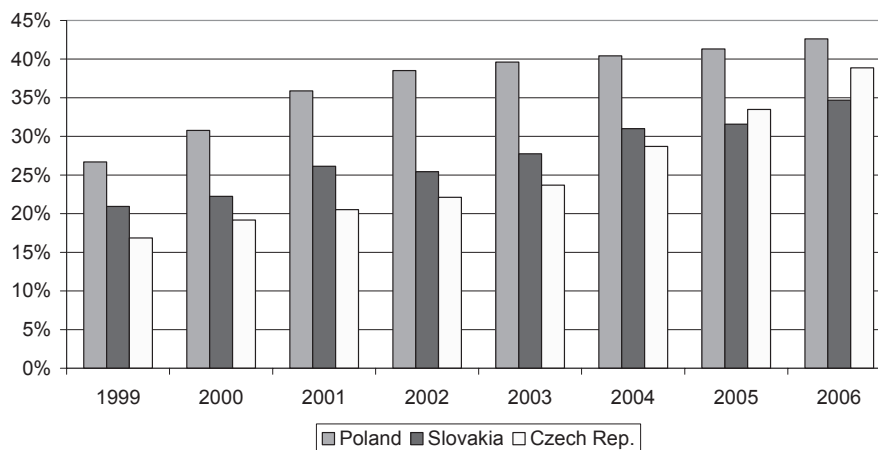
Source: EUROSTAT, demographic data

Using these three charts we can compare different demographic trends in analyzed countries. One can see the decrease in number of births of about 50% from the maximum. While in the Czech Republic the maximum is at the end of

70s, in Slovakia it is at the beginning of 80s and in Poland it is even at the half of 80s. The diminishing process had last about 30 years in Poland while in the Czech Republic the length of decrease had been about 20 years only. It means that *ceteris paribus* this process should be much stronger. One can also see that the change of the trend is the first in the Czech Republic (in comparison with two other countries). We can conclude that the 2<sup>nd</sup> Demographic Revolution is finished in the Czech Republic, while in Slovakia and Poland its consequences persist.

Nevertheless, the main outcome from these charts is common from all countries and is obvious: while the trend of births was decreasing before 22 years, the trend of graduates is opposite. The trend of the ratio of the graduates to shifted births we can see on the chart 5.

**Chart 5: Graduates to births ratio  
(births shifted of 22 years)**

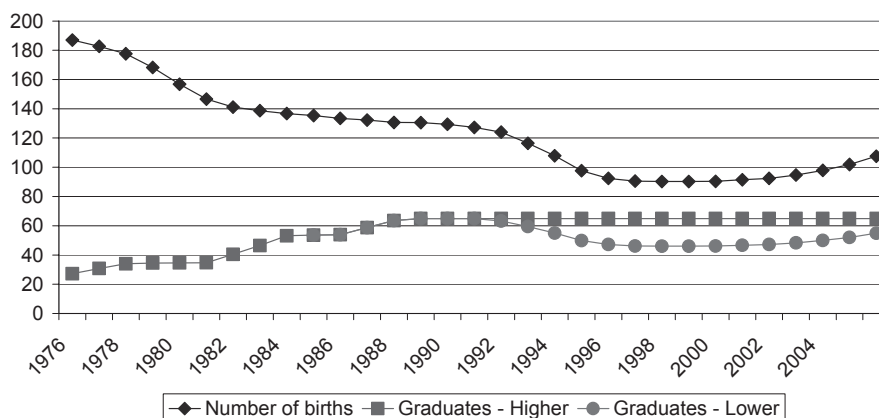


Source: EUROSTAT, demographic data, computations of authors

One can see the strongly increasing trend of this ratio in all three countries. For example, while only 16 percents of the population born in 1977 graduated in the Czech Republic in 1999, during seven years this ratio have risen to nearly 40 percents in 2006.

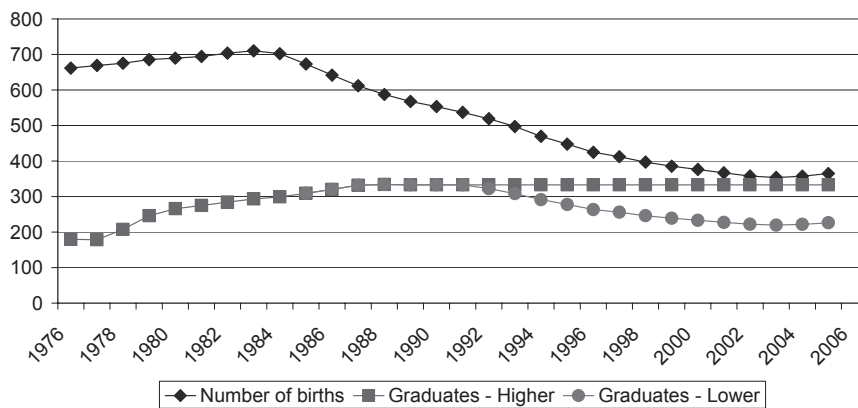
We can see the prognosis of the number of graduates on the charts 6 to 8. Remember the higher alternate uses the assumption of the constant number of enrolments, the lower alternate assumes the constant enrolments in next three years and then the constant graduates to shifted-birth ratio.

**Chart 6: Number of births and the graduates  
(with a 22-year shift, from 1985 prognosis)  
Czech Republic (in thousands)**



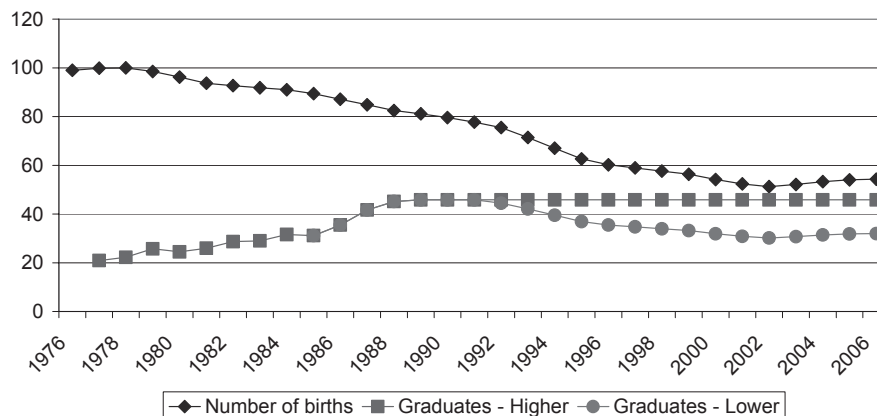
Source: EUROSTAT, demographic data, computations of authors

**Chart 7: Number of births and the graduates  
(with a 22-year shift, from 1985 prognosis)  
Poland (in thousands)**



Source: EUROSTAT, demographic data, computations of authors

**Chart 8: Number of births and the graduates  
(with a 22-year shift, from 1985 prognosis)  
Slovakia (in thousands)**



Source: EUROSTAT, demographic data, computations of authors

Using the higher alternate, the graduates to shifted-birth ratio will almost reach 1 (!). It means that nearly each person born before 22 years will be tertiary educated. It is a nonsense, but on the other hand, the alternate oriented on the sustaining of the above mentioned ratio leads to the important decreasing of the number of graduates (and students) at the tertiary education institutions. It should influence the model of financing of these institutions.

#### 4. Discussion

Our model has some simplifications and expert estimates. Despite this fact the main results of the analysis and prognosis is obvious. The trends in the number of graduates, caused by the pressure on the increasing of the nation's level of educations, are in contrary to the demographic development before ca 20 years. In further years, it will be necessary to decrease the number of enrolled and graduated students at the tertiary education institutions, unless we allow the decreasing quality of tertiary education.

If we want to increase the nation's level of education, we generally have several alternates. Firstly we can increase the number of new enrolled students from the young population. It is relatively easy, but it has some troubles in relation to the demographic situation and trends. The second alternate leads to increasing enrolments in connection to the demographic data. In this case the in-



creasing of the nation's level of education is slower. The third alternate is based on increasing the education at the population in the middle age, including motivation for this sub-population. All these alternates are also related with the task of the tuition fees.

## 5. Conclusion

In the presented paper we analyzed the trends in the tertiary education system in three selected countries in connection with demographic trends in these countries. We conclude the increasing of the nation's level of education should reflect the demographic trends. Without respect of this relation, the quality of the tertiary education could rapidly decrease.

## Literature

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- [4] MAZOUCH, Petr, FISCHER, Jakub (2007b). Longer Life Caused by Higher Attained Level of Education: How to Value this Advantage. Lisabon 22.08.2007 – 29.08.2007. In: *Bulletin of the International Statistical Institute 56th Session – ISI 2007 [CD-ROM]*. Lisabon: International Statistical Institute, 2007, s. 1–4.
- [5] *OECD*. Education at a Glance 2007. ISBN 978-92-64-03287-3.

## **Streszczenie**

### **Rosnący poziom edukacyjny w wybranych krajach Europy Centralnej – czy to korzystne?**

Celem tego artykułu jest porównanie trendów kształcenia młodzieży na trzecim stopniu edukacyjnym w Czechach, Słowacji i Polsce, w kontekście ogólnych trendów demograficznych.

Dość szybki wzrost współczynnika liczby studentów do ogólnej liczby mieszkańców może spowodować problemy dotyczące nadmiaru ludzi wykształconych. Ponadto znaczny wzrost liczby studentów może powodować spadek jakości kształcenia.