

EDUCATIONAL STRUCTURE AND LABOR MARKET EXPECTATIONS IN THE NORTHERN GREAT PLAIN REGION

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SUMMARY

As a result of the processes of Hungarian economy and society the increase in territorial differences is noticeable in the last few years. The changes in society's status, the rate of increase and the level of development can be tracked for example in the diverse variation of labor market. In our study we would like to demonstrate the typical processes of labor market based on the time scale 2000-2007, and we also want to reveal the root causes of the change in unemployment rate.

The source of data is a regular, representative labor-survey by the Hungarian Central Statistical Office based on interviewing people, as well as registration on place-hunters by the Employment and Social Office together with the summary of governmental subsidy.

For trend determination, except for data extrapolation a new approach is mentioned as well. As a further research the Analytic Hierarchy Process (AHP) seems applicable for forecasting the labor market changes.

Introduction

The recent social and economical processes resulted in the increase in territorial differences. The difference between labor market characteristics of Hungary's regions is obtrusive, and reflects the differences in economical and social state of development. Our research covers Hungary's least favorable region's, the Northern Great Plain's labor market characteristics and changes.

The development of countryside economy is very important for Hungarian economy and society, the improvement of rural people's living conditions, the drastic increase of population observing ability of countryside territories. Although in recent crisis state of world economy, these problems are seldom mentioned at the highest decision levels, soon strategic decisions will be necessary.

The more and more pressing needs have to be considered as well as the limited – and soon to be more limited in the future – options, and in view of these should it be defined what and how to improve. Of course the aim of countryside development should be that living conditions of rural people should improve in long term, which is it should be seductive to live there. Since the majority of the inhabitants in scope live in the country, this makes the state of labor market and stabilizing its operation a central matter.

We consider the factors affecting the state of labor market to be known, as by knowing them the possibility of positive changes opens. This is extremely important in the recent world economy situation in the long term, as economical-social needs equally demand it.

Research methodology

The Northern-Great Plain region lays in the Northeastern part of Hungary, bordered by Slovakia, the Ukraine and Romania. Its territory measures up to 17.729 km², which is 19,1% of Hungary's territory. 15,3% (1,56 million) of the population of the country lives there (KSH, 2001). The less than 29 age group contains 643.128 young people. The consistency of population is below the average of the country, as one km² holds 86 people, which makes this region the less populated amongst the seven regions.

Figure 1: Northern Great Plain Region



Source: Own edit

An economical disadvantage of the region (amongst others) is the negative migration balance in the past few decades. 49 settlements of the 387 in the region are cities, but while most of the settlements are in Szabolcs-Szatmár-Bereg, most of the population lives in Hajdú-Bihar and Jász-Nagykun-Szolnok. The source of data is the information collected by Central Statistic Office; it is the basis of my analysis.

The analysis of data covers the time period 2000-2007, by secondary inspections. The starting point is the 15-74-year-old (1.15 million people) which is significant part of the region's population concerning employment, the analyses were based on 3 age groups, sex and education level. In our article, we analyze the previously mentioned trends from the viewpoint of labor market supply and demand.

In case of fitting lines and polynomial curves to data points, when

$$y = ax + b, \tag{1}$$

we know that this is a line with slope a . We know that a line will connect any two points. So, a first degree polynomial equation is an exact fit through any two points. If we increase the order of the equation to a second degree polynomial, we get:

$$y = ax^2 + bx + c; \tag{2}$$

This will exactly fit three points. If we increase the order of the equation to a third degree polynomial, we get:

$$y = ax^3 + bx^2 + cx + d; \tag{3}$$

This will exactly fit four points. A more general statement would be to say it will exactly fit four constraints. Each constraint can be a point, angle, or curvature¹. Angle and curvature constraints are most often added to the ends of a curve, and in such cases are called end conditions. Identical end conditions are frequently used to ensure a smooth transition between polynomial curves contained within a single spine. Higher-order constraints, such as "the change in the rate of curvature", could also be added.

Bearing this in mind, the first degree polynomial equation could also be an exact fit for a single point and an angle while the third degree polynomial equation could also be an exact fit for two points, an angle constraint, and a curvature constraint. Many other combinations of constraints are possible for these and for higher order polynomial equations.

If we have more than $n + 1$ constraints², we can still run the polynomial curve through those constraints. An exact fit to all the constraints is not certain. In general, however, some method is then needed to evaluate each approximation. The least squares method is one way to compare the deviations.

High order polynomials can be highly oscillatory. If we run a curve through two points A and B, we would expect the curve to run somewhat near the midpoint of A and B, as well. This may not happen with high-order polynomial curves, they may even have values that are very large in positive or negative magnitude. With low-order polynomials, the curve is more likely to fall near the midpoint³.

Low-order polynomials tend to be smooth and high order polynomial curves tend to be "lumpy". To define this more precisely, the maximum number of ogee/inflection points possible in a polynomial curve is $n-2$, where n is the order of the polynomial equation. An inflection point is a location on the curve where it switches from a positive radius to negative. We can also say this is where it transitions from "holding water" to "shedding water". Note that it is only "possible" that high order polynomials will be lumpy, they could also be smooth, but there is no guarantee of this, unlike with low order polynomial curves.

¹ which is the reciproc of the radius of an osculating circle

² n being the degree of the polynomial

³ it's even guaranteed to exactly run through the midpoint on a first degree polynomial

A fifteenth degree polynomial could have, at most, thirteen inflection points, but could also have twelve, eleven, or any number down to zero. Other types of curves, such as conic sections⁴ or trigonometric functions⁵, may also be used, in certain cases.

Demand side

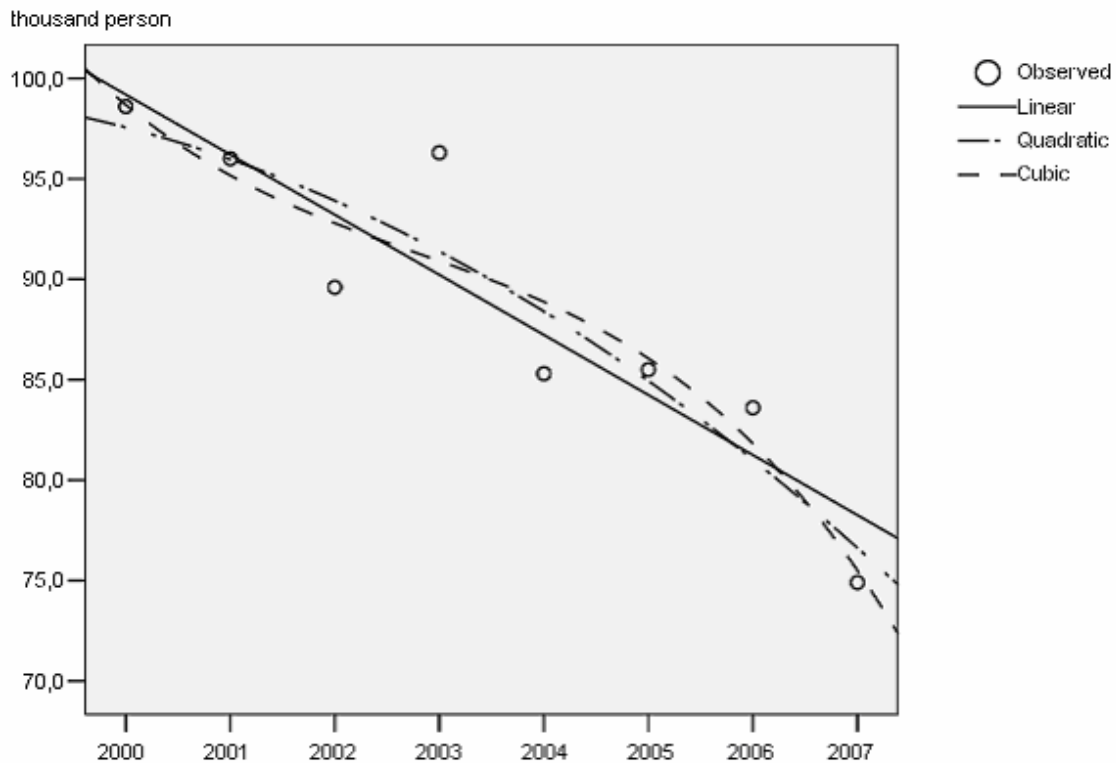
The employment diagrams reveal the underlying trends of the current labor market.

8 classes or less

First, let us take the employment rate of people with less than 8 completed classes. These people represent traditionally the lowest segment of the society characterized by the lowest monthly wage and life standard. Getting employed with such a low educational level has never been easy and after 2000, it became even more difficult.

As it can be seen from the chart, the employment rate has been declining for the observed period of time. It can also be observed that the pace of decline is accelerating. It can be foreseen that with time, an even smaller number of people will be employed (legally) who have less than 8 classes of education.

Figure 2: Number and possible trends of the 8 classes or less employees



Source: Hungarian Central Statistical Office, own edit

⁴ circular, elliptical, parabolic, and hyperbolic arcs

⁵ such as sine and cosine

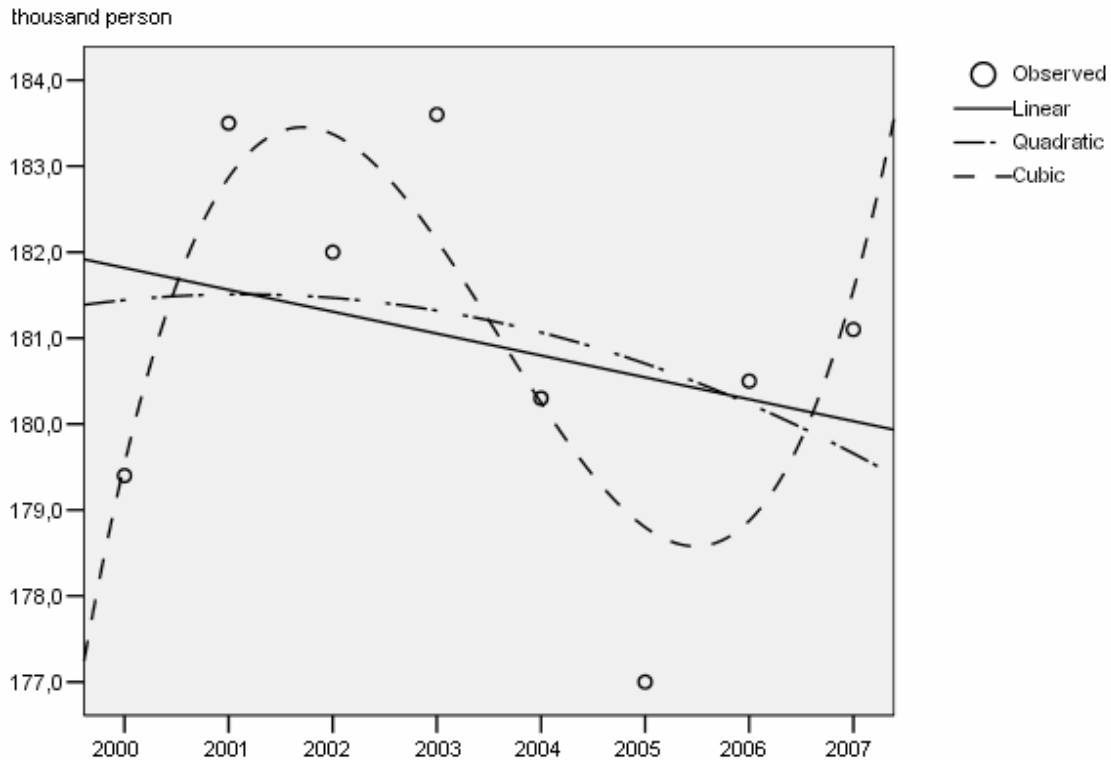
The underlying reasons are diverse. First, it is to be observed that the growing number of students graduating from secondary and tertiary education crowd out people with 8 or less completed classes from jobs that have been done by the latter group previously. Employees require thus higher education level for the same job due to the reason that prospective employees with higher educational level are available in a bigger quantity now.

Second, it can be also observed that there are less and less people who only have 8 classes or less. If everybody completes 8 classes and goes to a secondary school, there will be simply less employees having 8 classes or less.

Vocational school graduates

If we take the employment rate of people having completed a vocational school we can observe a highly cyclical pattern. After the plunge between 2003 and 2005 we can observe skyrocketing need for workers having a vocational degree (figure 3.). The trend is expected to continue in 2008 and 2009 as well, showing increased demand for these workers. It is no wonder the phenomenon occurs. The number of vocational degrees has been falling since the early nineties. Nowadays, there is excess demand for anyone who possesses of a qualification that can be assessed in a vocational school.

Figure 3: Number and possible trends of the vocational school graduates employees



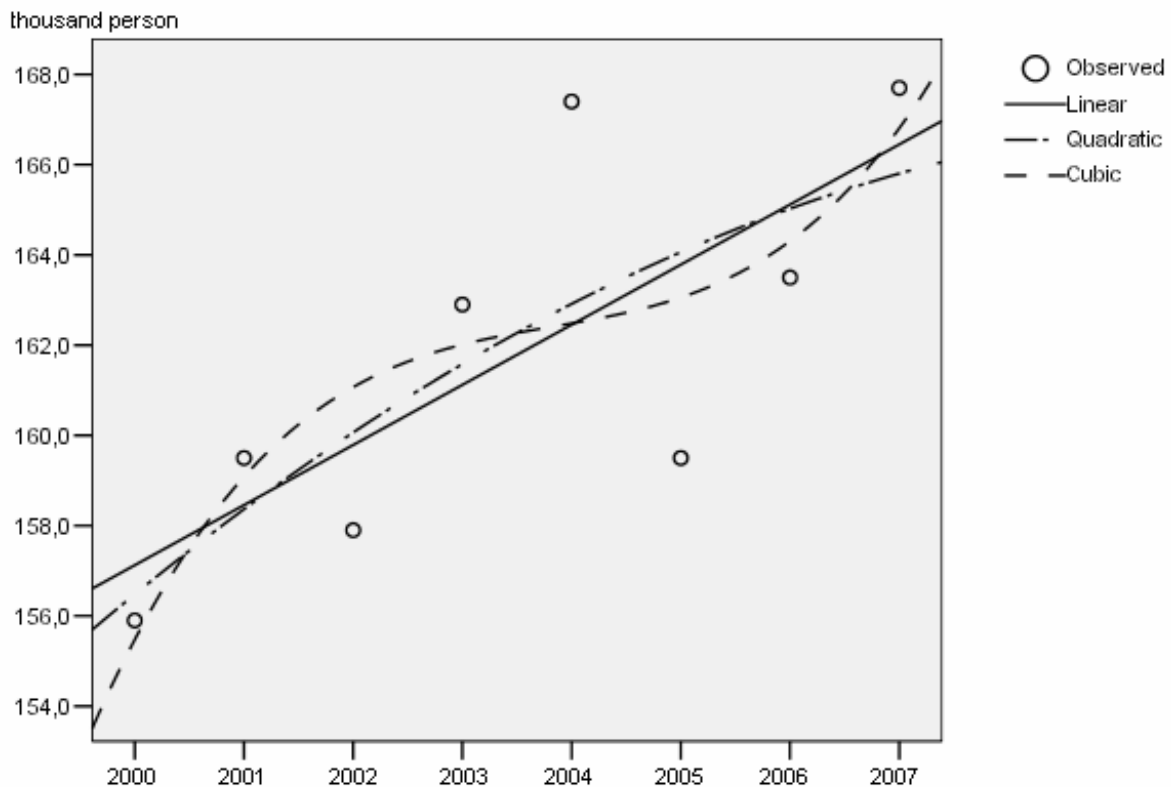
Source: Hungarian Central Statistical Office, own edit

The employment figures of those who completed high school also shows cyclical pattern. (Figure 4) However, the trend shows a steady rise in the number of employed people, and it is also expected that the rise will continue. This rise is mainly due to the ones, having completed a technical college, instead of a grammar school. The reasons for this assumption are the following:

First, the number of graduates from universities has been expanding since 2000. They steadily crowd out secondary school graduates from jobs that required previously only the lower degree. So, it is almost impossible to find a job that requires no professional qualification without a university degree.

Second, due to the previously mentioned reason and the massification of higher education more and more secondary school students decide not to enter the labor market but to stay in the education system and go to some university. Thus, if there are less people entering the labor market, less people can be employed. This evidently results in the increase of the portion of employed technical college graduates.

Figure 4: Number and possible trends of the vocational school graduates employees



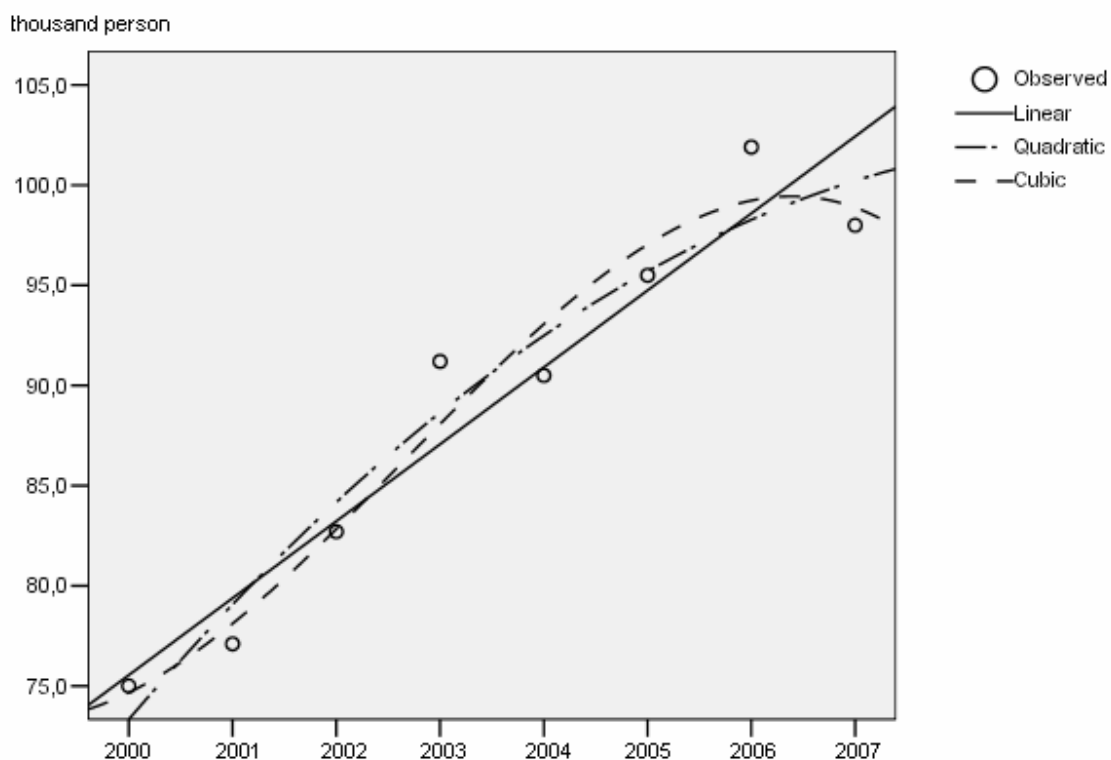
Source: Hungarian Central Statistical Office, own edit

University graduates

The graph showing the employment figures of college and university graduates reveals interesting dynamics. (Figure 5)

Due to the massification of higher education the number of graduates has been increasing since 2000, and until 2005-2006 the economy was able to absorb this increased supply. But since then, the employment rate of higher education graduates has been falling and this accelerating decrease is expected to continue in the near future as well.

Figure 5: Number and possible trends of the high quality (college, university) employees



Source: Hungarian Central Statistical Office, own edit

It is very important to note that all our calculations have been based on data prior to the 2008 crisis. Of course, the crisis is expected to affect employment figures negatively, so there will definitely be a difference between our calculated data and the actual figures of the future.

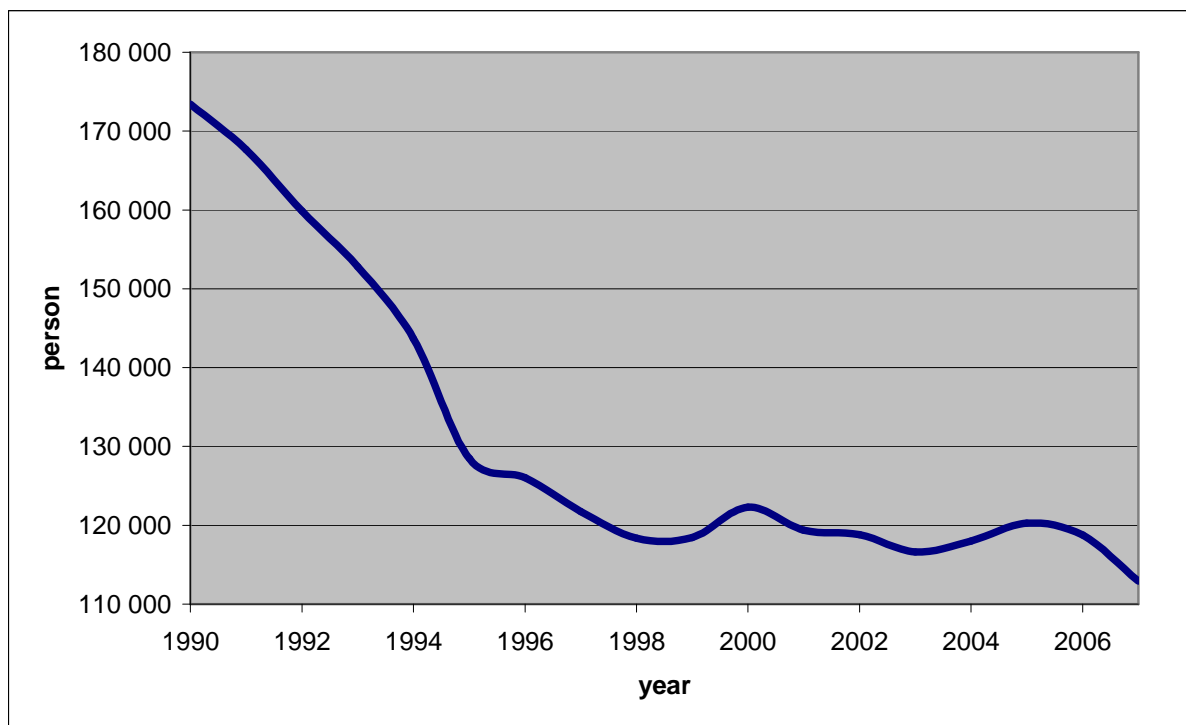
However, it can be seen from our analysis that the decrease in the number of employed higher education graduates and those with 8 or less completed classes is not a result of the crisis; it would have happened this way without crisis as well. The crisis will only worsen their employment situation, but is no reason of it.

The employment of the two groups with professional education is also expected to worsen due to the crisis. But it is not yet clear by what means and to what extent it will be affected. Answering this question lies beyond the scope of our analysis.

Supply side

Our analysis of the Hungarian education system regarding output quantities is based not on regional but on countrywide statistics. This is because it would be a vague idea to assume that every single student who leaves the education system will enter the labor market in the same region. Graduates move on and the higher the graduation level is the more likely it is that somebody will move to another region of the country. (Figure 6.)

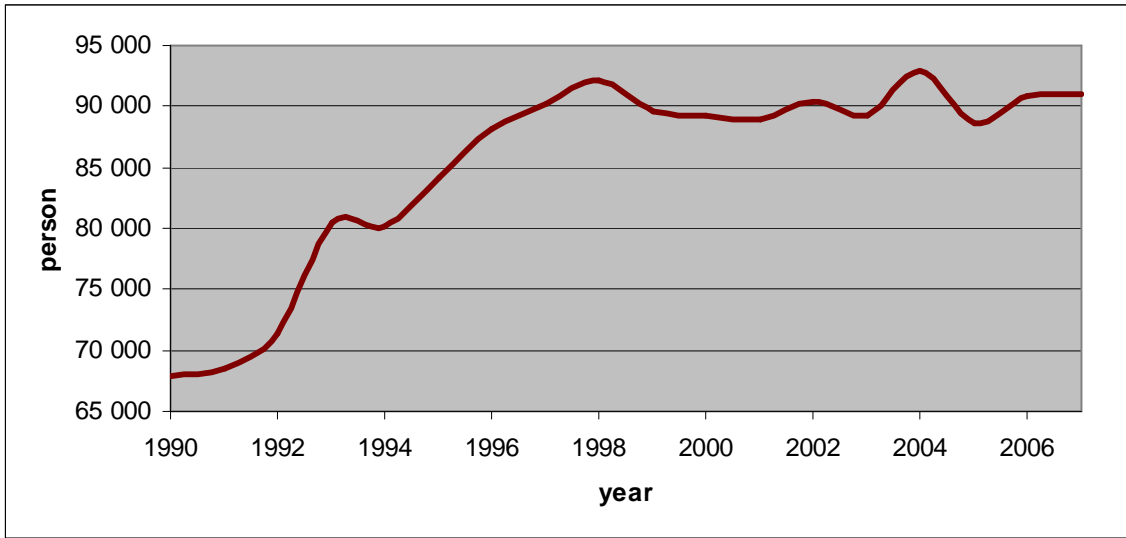
Figure 6: Number of the 8 classes or less completed people



Source: Own edit

There was a huge drop in the number of people having completed only 8 classes or less. While in 1990 there were 173 411 of them, this number sunk till 112 927 in 2007, so it seems to stabilize around 120 000 ever since 1997 with minor fluctuations. If we also take into account what is expected to happen on the demand side, it seems to be obvious that in the future we can count on the worsening labor market situation of this group. It seems to be obvious that it is no longer enough to have 8 classes (let alone less) to get a job and avoid unemployment.

Figure 7: Number of the secondary school graduates

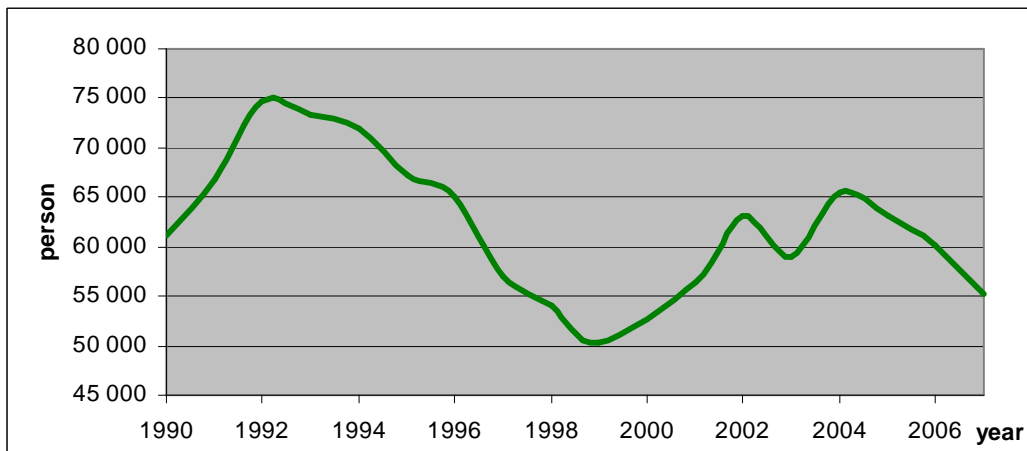


Source: Own edit

As we can see, the number of students graduating from grammar schools has been expanding since 1990 and this expansion continued until 1998 where the number of graduates stabilized around 90 000, with minor fluctuations. But if we take into account, what is expected to happen on the labor market concerning grammar school graduates, we can anticipate worsening unemployment situation of this group, which is a reason for graduates moving towards higher education.

The graph of vocational school graduates (figure 8.) is difficult to analyze due to major fluctuations. However, a downward trend can be observed in the long run. Together with our demand side findings we can state that there is already excess demand for these graduates and the gap between supply and demand is only going to widen in the next few years.

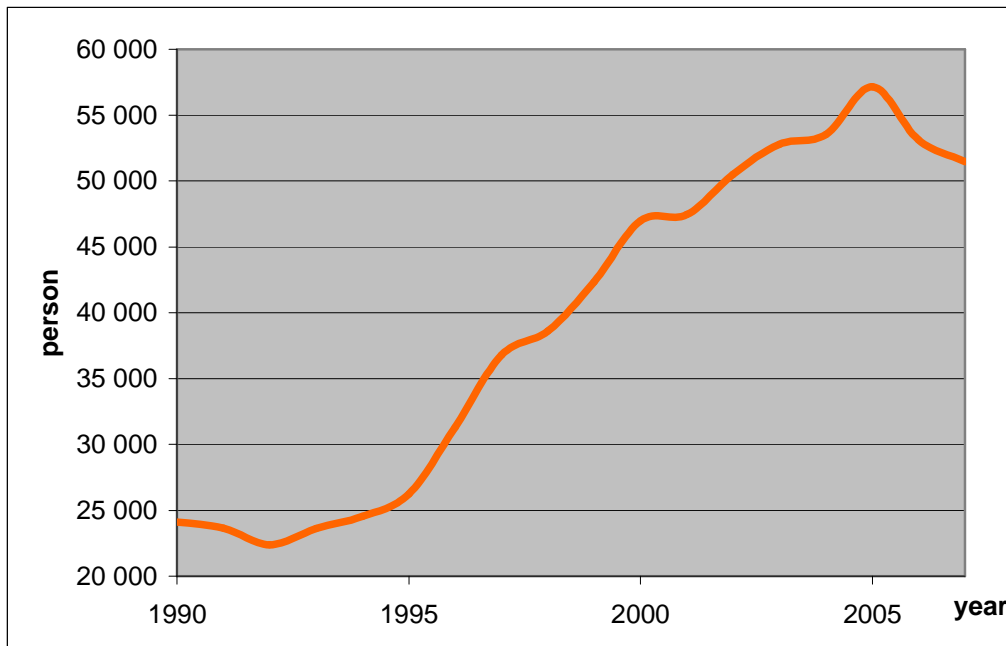
Figure 8: Number of the vocational school graduates



Source: Own edit

There is a clearly visible upward trend in the number of university graduates, which started even in the early nineties around 24 000 and peaked in 1995 with almost 60 000 graduates a year (figure 9.). This increase in the number of graduates has not been followed by an increase in demand for them; what's more there is a sharp drop in the recent years.

Figure 9: Number of the vocational school graduates



Source: Own edit

These reverse trends lead to the conclusion that the employment situation of these graduates is going to be far worse in the near future.

Another possible approach for determining the future trends of the labor market

In order to forecast the forthcoming trends, there are many other methods that offer different aspects than data extrapolation. One applicable example is the Analytic Hierarchy Process (AHP) that has already been used for trend determination (Duleba, 2008). The AHP is able to synthesize several opinions and check their consistency at the same time. Another important characteristic of the method is the possibility to make sensitivity analysis of the ultimate results. Thus the most crucial factors can be determined so we can sophisticate the future scenarios and highlight the possible alternatives as well.

AHP was developed to solve complex problems. This implies that directly answering the basic question (eg: which quote to choose, which tool to purchase, etc.) is rather difficult, so it should be divided into parts that can be answered separately more easily. The ultimate goal is always to choose from the alternatives. Since we are unable (or don't want) to decide from the possibilities directly, we set up viewpoints, that helps us to evaluate the alternatives indirectly. If the problem is even more complex we divide the viewpoints into sub-viewpoints and evaluate based on these. The decision itself is the setup of an ordinal scale, namely the organization of the alternatives according to different viewpoints and evaluation according to each other.

The evaluation is much easier if we correlate one possibility of choice to one other only and not to all the possible alternatives, based on a specific viewpoint. It can be decided in most cases, which of the two alternatives is the more beneficial for the decision-maker from one specific point of view.⁶ The methods consist of serial pairwise comparisons. These comparisons, to be in a perspicuous system, were organized into matrixes by Saaty (1977). This laid down the mathematical basis of AHP.

This method is recommended to use in four steps:

1. Identification of the accurate decision problem and establishment of hierarchy
2. Pairwise comparisons between the factors of decision
3. Evaluate the final impact of criteria
4. Produce the final procedure of selection

The key issue for using this method for determining labor market trends is the proper evaluation of the influencing drivers that affect the labor processes. Building up this hierarchy is task of further research.

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⁶ Where this is not available AHP can not be used.