

Possible Structure Development of Job Seekers by the Highest Level of Education Attained

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Abstract

The aim of this paper is to assess how operate the educational system in terms of “producing” the graduates which are able to find a job after their studies. We point out the number of job seekers by the gender and the highest level of education attained up to the year 2030 according to Czech Statistical Office classification (incomplete and without education, primary, apprentice, secondary without high school diploma (HSD), apprentice with HSD, secondary common with HSD, secondary vocational with HSD, higher, and university) by the models with constant linear trend and with 95% confidence intervals (as the optimist and pessimist scenario) for each category of job seekers. We came to the conclusion that there are disproportions between the labour market needs and the structure of job seekers, especially by gender. If the current trend does not change, there will be e.g. still more job seekers males than females – with vocational education, and more females than males - with higher and university degree.

Keywords: level of education; job seeker; efficiency of educational system; disproportions by gender

JEL Classification: C20, J11, J45

1 Introduction

Unemployment of new graduates is a long discussed problem among policy makers as young people belong to sensitive category of persons with difficulties to find a job. Especially graduates lacking skills and practise are endangered by unemployment. The level of highest education attained by the school graduates has increased recently in the Czech Republic. Similarly with this development, the number of university graduates grew too (see e.g. paper by Potužáková [18] or Kubanová, Linda [13]). These processes (besides macroeconomic situation) lead to the increase of the number of unemployed people as these graduates were not able to find the job appropriate to their level of education. “The mismatch between supply and demand in the labour market has been constantly increasing in the sense of the decreasing number of vacancies for the increasing number of job applicants” (Sobotková, Dohnalová [19]). “The quantity leads to a decline in quality” concludes Pavelka [15] in his analysis of the trends in higher education in the Czech Republic since 1989. Czech Republic belongs among countries with high-quality and effective educational system. It is unfortunate that there are large gaps even in these countries graduates with a certain educational attainment end up at the Labour Offices. The situation may be tolerable if it is the case of a seasonal fluctuation. However, if the development of registered job seekers is represented by long-term system that could be improved it should be.

The problem of readiness of the graduates to the job market is not present only in the Czech Republic. For example Stanciu, Banciu [20] examined this issue in Romania and Bédoué, Giret [1] in France. Hudáková, Lusková [7] analysed the needs and requirements of the labour market in Slovakia in order to improve the study programme at their university so its graduates can find a job easier. The education of the graduates should match their jobs. Otherwise there are “penalties” in terms of lower salary or job satisfaction as found out by McGuinness, Sloane [14] for the case of United Kingdom. “There are large wage penalties for being in a job for which one is currently overeducated and a substantial, but smaller, wage penalty for being overskilled. However, only males suffer a significant wage loss as a consequence of current overskilling” (McGuinness, Sloane [14]). Surprisingly, in Hungary, the number of university graduates has decreased recently (see

study of Kómvés, Dajnoki [11]), which might bring better perspective for the students to be employed.

To describe the situation and possible development in the Czech Republic is the aim of the paper and the main goal is to assess how operate the educational system in terms of “producing” the graduates which are able to find a job after their studies. The paper is structured as follows: first section describes used data and assumptions of the projection. Next section presents the results. Last section discusses and concludes.

2 Material and Methods

The input datasets for the analysis are obtained from the public database of the CZSO “The structure of job seekers registered by Labour Offices – by education, age and duration of unemployment (actual on 31st December of the particular year)” (CZSO [5]). There are available the time series from 2004 to 2014 and the classification by the highest level of education attained has the following structure: (A): incomplete and without education, (B): primary, (C): apprentice, (D): secondary without high school diploma (HSD), (E): apprentice with HSD, (F): secondary common with HSD, (G): secondary vocational with HSD, (H): higher, (I): university (at least bachelor degree or higher). From the demographic point of view the person is economically productive in the age group 19–65 completed years. Of course, a certain number of people in each population works before the age of 19 (indicated as -19). On the other hand, there are persons able to work later than at 65 (indicated as 65+). For this reason, we introduce a certain simplification within the data matrix compatibility – for mutual comparison with other data structures within the CZSO’s surveys and results we will consider the age group -19 as comparable to 15–19 and the age group 65+ as comparable to 65–69. As stated by Fiala, Langhamrová and Průša [6] “an error which resulting from this simplification is negligible in similar studies”. In addition to the aforementioned “Structure of job seekers registered by the Labour Offices” we use the results from the “Population projection of the Czech Republic up to the year 2100”, according to CZSO in low, medium and high variant (CZSO [4]), but for the years 2015–2030 only. These results serve as a support for our calculations.

Because the time series about the development of registered job seekers is short (only from 2004 to 2014), it is not possible to use ARIMA models (Box, Jenkins [3]) to predict the future trend (see e.g. study by Pflaumer [17], who had several decades of observation). On the basis of expert expectations, which are applied e.g. in demographic models of aggregate statistics, we use extrapolation with constant trend and calculate both side 95% confidence intervals as an upper and lower limit, that will be affected by variability of the past development. (These expectations are used e.g. in papers by Bogue, Anderton, and Arriaga [2] or Stauffer [21] and in the condition of the Czech Republic e.g. by Hulík [8] or Fiala, Langhamrová and Průša [6]). In our analysis, it is not appropriate to use the classical linear regression model in the form

$$y_t^{M/F} = \text{const}_t^{M/F} + \beta \cdot \text{trend}_t^{M/F} + \varepsilon_t^{M/F} \quad (1)$$

where $y_t^{M/F}$ is analysed time series of particular statistic specific by gender, $\text{const}_t^{M/F}$ is a constant, $\text{trend}_t^{M/F}$ is a linear deterministic trend and finally $\varepsilon_t^{M/F}$ is a residual term. This model would provide an estimate of the (increasing or decreasing) slope of a trend that would not be appropriate to extrapolate into the future. More realistic is the use of a constant trend where

$$\left(\text{const}_t^{M/F} + \beta \cdot \text{trend}_t^{M/F}\right) = \hat{c}_t^{M/F} \quad (2)$$

creates the medium variant of the future development. The upper (as the pessimist scenario) and lower (as the optimist scenario) bound of this development can be calculated as

$$y_{t+h}^{M/F} [\text{high, low}] = \hat{c}_t^{M/F} \pm 1.96 \cdot \sigma^{M/F} \quad (3)$$

where $1.96 = u_{0.975}$ is a 97.5% quantile of normal distribution and $\sigma^{M/F}$ is a standard deviation specific for particular gender and category of job seekers. For each group of job seekers by the

highest level of education attained (marked with the letters A–I) we perform an extrapolation within the optimistic (low), medium and pessimistic (high) scenario up to the year 2030.

Using the “Population projection of the Czech Republic up to the year 2100” (CZSO [4]), particularly the results for the years from 2015 to 2030 in low, medium and high variant the analyses are merged to provide an expert expectation about the potential future development of age-and-sex-specific demographic structures of job seekers in optimistic (low), medium and pessimistic (high) scenario. Followed by matrix operator approach of Keyfitz [9], or Bogue, Anderton, Arriaga [2], and in the case of small specific population modelling according to Šimpach, Langhamrová [23] or Šimpach, Pechrová [24] we perform an estimation as

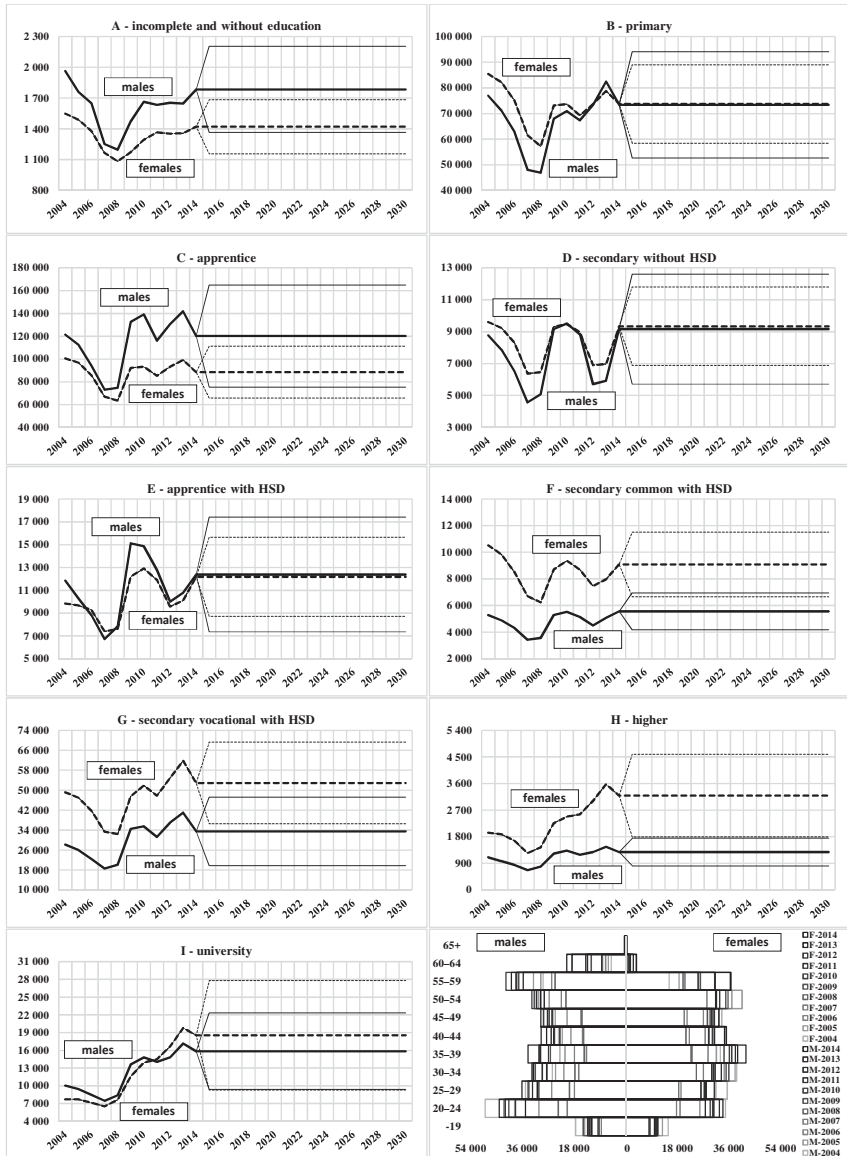
$$j_{t,x}^{M/F} [\text{high; medium; low}] = \sum_{ED} y_{t+h}^{M/F} [\text{high; medium; low}] \times \frac{j_{t=2004,x}^{M/F}}{S_{t-1,x}^{M/F} [\text{high; medium, low}]} \quad (4)$$

where $j_{t,x}^{M/F}$ is age-and-sex specific number of job seekers according to particular scenario in time $t = 2015\text{--}2030$, the sum of $y_{t+h}^{M/F}$ is the total number of predicted job seekers without distinction of education (groups A–I in total), $j_{t=2014,x}^{M/F}$ is the last known number of x -year old job seekers by gender and $S_{t-1,x}^{M/F}$ is the age-and-sex specific number of living persons in the Czech Republic according to Czech Statistical Office’s Population projection in particular scenario. On the basis of these assumptions we construct three population pyramids of the potential future development of job seekers specific by age and sex. The most likely scenario is the medium variant. Optimistic and pessimistic scenario creates a lower and upper limit, where the estimates will be located with 95% confidence. Although it seems that the intervals are relatively wide they still can be applied in many other necessary studies e.g. for planning of study programs, reaccreditation of study plans in another directions and trends, marketing of high schools and universities or social and employment policy (see e.g. paper by Kincl, Novák, and Štrach [10] or Krebs, Průša [12]).

3 Results and Discussion

In the first part we calculate an estimate of the constant deterministic trend for individual groups of job seekers by gender and educational attainment. Based on the data variability we also estimate 95% both side confidence intervals. The results are shown in the Figure 1, where plots A–I represent the individual educational groups according to the classification of the Czech Statistical Office. The lower and upper bounds represent the optimistic and pessimistic border, which would not be exceeded in future. (Charts A–I also include the empirical data of analysed time series in years 2004–2014 by sex). Variability in all groups of educational attainment is usually higher in the case of male population. This is caused by significant male fluctuation between the working positions. Male positions are also more affected by seasonality, which increases the probability of registration at the Labour Office. (This effect is more concerned with males with lower level of education – primary, apprentice and secondary without HSD (jobs of seasonal workers). Unpleasant findings are that the growing trend in the analysed numbers of registered job seekers is observed in both males and females in the group of higher education and university education. This is an issue as the complications with finding a job in higher educational groups is mainly caused by high number of graduates from certain study fields (especially in humanistic character). Low educational costs, particularly at the humanities study field, and the “relative convenience” contributes to the popularity of studying the university (see e.g. paper by Pavelka [15]).

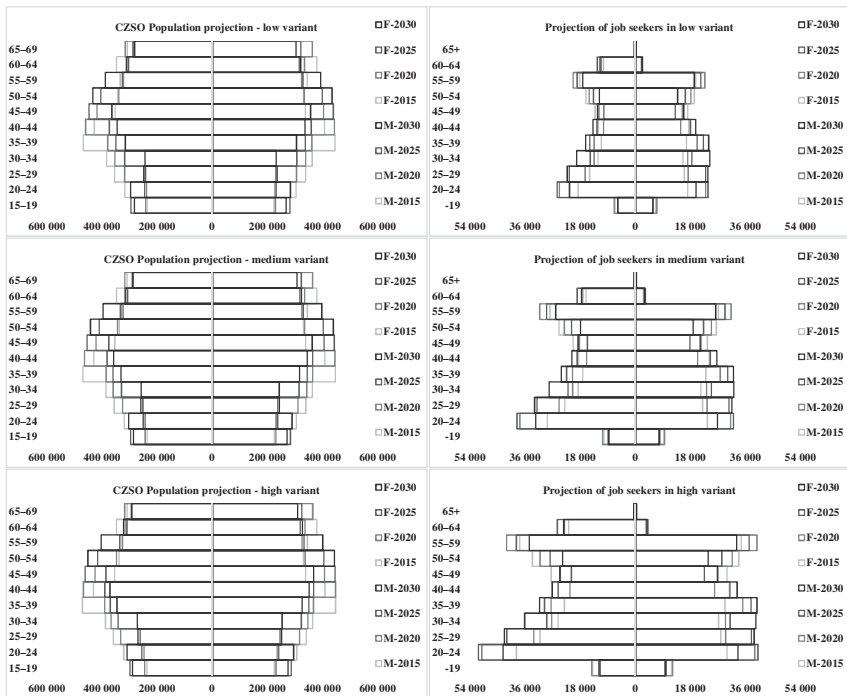
Figure 1. Development of job seekers registered at the Labour Offices (males – full line, females – dotted line) by the highest level of education attained together with extrapolation up to the year 2030 and 95% intervals of confidence (A – incomplete and without education, B – primary, C – apprentice, D – secondary without HSD, E – apprentice with HSD, F – secondary common with HSD, G – secondary vocational with HSD, H – higher, I – university. In the last chart is presented the development of age-and-sex specific structure of job seekers in the period of 2004–2014.



Source: Author and [5]

However, the vision of a potential future problem to succeed in the labour market is hidden or overlooked (see e.g. paper by Pechrová [16] about responsibility and support from teachers at the secondary schools). (In the Figure 1 is also shown the age-and-sex-specific structure of registered job seekers in the years of 2004–2014 without distinction of education attainment. Darker stripes on the outer edge of the population pyramid mean that the number of registered job seekers grew over time.) In the second part we firstly predict the development of age-and-sex-specific demographic structure of job seekers in 2015, 2020, 2025 and 2030 based on the results of expert expectations of the potential future development of job seekers by the highest level of education attained. Secondly we present the results of Population projections of the Czech Republic according to CZSO. Both results are presented in Figure 2. It is evident that the highest probability of failure in the labour market is in the case of new young graduates and then in the case of persons in higher ages. The employers are afraid to employ older people because they expect them to work less efficiently (see e.g. Krebs, Průša [12]). This distribution is across the particular age groups more uniform in the case of female population, especially in the range of 20–24 years to 40–44 years. This is due to maternity and parental leave, which can cause the obstacles in returning back to work for females who stay home with their children (see paper by Potužáková [18] or Šimpach, Dotlačilová and Langhamrová [22]). Therefore, the employment policy should give greater attention to this issue – to help to females’ easier find a job after maternity and parental leave compared to stay at the labour offices.

Figure 2. Population projection of the Czech Republic in low, medium and high variant (males are in chart on the left side, females on the right side) according to Czech Statistical Office in selected age-groups from 15–19 to 65–69 years (left charts) to 65–69 years (right charts) and Projection of job seekers in optimistic, medium and pessimistic variant in selected age-groups from -19 ≈ (15–19) to 65+ ≈ (65–69) years (right charts) according to expert expectations.



Source: Author and [4]

4 Conclusion

The aim of this paper was to evaluate the situation in the Czech Republic based on the latest available data about registered job seekers at the labour offices by the highest level of education attained and to point out the possibilities of improving efficiency in the placement of applicants. We presented the possible development of the number of unemployed graduates according to highest level of education attained and possible development of age-and-sex population structures of these persons. The reasons for unfavourable development might be various. The determinants which influence the number of unemployed graduates in the Czech Republic were examined by Sobotková, Dohnalová [19]. They focused not only macroeconomic situation of the country, but also subjective matters of the graduates. They found out that the most of the respondents have unrealistic ideas about the actual needs of the Czech labour market and that the profession selected by the graduates is often independent of their study field (Sobotková, Dohnalová [19]).

There is also an important issue from the point of view of the employers. Despite that they value the degree of their possible employees, the main problem is that graduates have better theoretical knowledge than practical training in the field (Stanciu, Banciu [20]). Béduwé, Giret [1] found out that in France the situations of vertical (qualification) mismatch and skill mismatch had strong negative effects on wages, while situations of horizontal (field) mismatch did not. Similarly for UK, there are large wage penalties for being in a job for which the graduate is overeducated or overskilled (McGuinness, Sloane [14]). "However, horizontal mismatch increases both job dissatisfaction and the desire to find another job, even if their job is qualified, permanent and reasonably well paid" (Béduwé, Giret [1]).

The results of our analysis suggest that problems occur in the case of male and female population immediately after graduation, and specifically in the case of females (probably) after returning from maternity and parental leave. Those are the issues where the system of placing applicants into the employment should be improved. The predicted numbers of registered job seekers by the highest level of education attained in three scenarios should serve as a guideline for employment policy.

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