

Looking at the Development of Private Returns to Education in Slovakia in the Context of Tertiary Education Expansion¹

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Abstract

This article brings figures on the development of private returns to education in Slovakia from 1984 to 2009. We use EU-SILC micro data referring to the period 2004 – 2009 to count the returns to education, using Mincerian regression methodology. The standard formulation of the equation was used to allow comparisons with earlier studies. The development of returns to education is put into the context of recent tertiary education expansion in Slovakia. The results show an initial increase in returns to education between 1984 and 1995, which can be linked to the transition mechanisms. After 1995 the private returns to education in Slovakia remained stable, what means that the tertiary education expansion is not visible when looking at the overall private returns to education in Slovakia.

Keywords: *returns to education, Mincerian regression, earnings, level of education*

JEL Classification: J24, J31, P23, P36, I21, I23

Introduction

Thanks to Jacob Mincer (1974), returns to education became one of the classical topics in labour economics. This issue attracted substantial attention in central and eastern European countries at the beginning of the transition period, in the Nineties. The contrast between central planned economy and market economy labour markets became an impulse for the study of the patterns behind the structure of earnings. Labour markets of transition countries offered a favourable

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environment for testing the assumptions of several theoretical concepts developed for market economies. One of those was the most prominent concept of human capital.

Slovak returns to education were described as a part of a Czechoslovak analysis in (Chase, 1997; Filer, Jurajda and Plánovský, 1999), or later focusing purely on Slovak data (Lubyova and Sabiriankova, 2001; World Bank, 2005). In line with several studies (Filer, Jurajda and Plánovský, 1999; Flabbi, Peternostro and Tiongson, 2008; Večerník, 2009) focusing mostly on Czech labour market, we can assume returns to education to be held down until 1989. Earning inequalities in Czechoslovakia before 1989 were one of the lowest in Europe. After the Velvet Revolution market mechanisms started to shape the earnings differently. The transition of the economy towards market economy brought also the transition of the earning differences and their determinants.

Theoretical Background

The first expectation regarding private returns to education in transition from central planned to market economy in Czechoslovakia says that, during the central planned period the returns to education were lower in comparison to a market economy. After 1989, with the progress in the transition process, the returns to education are supposed to rise. The central planners, in line with the official ideology tried to achieve as much income equality as possible. This policy was applied in Czechoslovakia quite successfully. This was achieved partially by the preference of secondary education mostly at the expense of tertiary education. This educational policy did not consider the actual demand for skills, nor did the wages.

Večerník claims that wages in the central planned economy are distributed according to the „basic needs principle“ (Večerník, 2009, p. 74), when the planners distribute income among population in order to achieve reproduction. As a result, workers in mining and heavy industries earn more than workers in services, because their work is physically more demanding. Also older men earn more than younger women, because they are commonly considered as “heads of families” and need to support other members of their families. Looking at the evidence on earning determinants before 1989, one can find a solid support for this reasoning. Gender and age played a crucial role in shaping earnings in Czechoslovakia before the Velvet Revolution. Also there is some evidence on favouring industries such as mining, agriculture, metal-working or heavy industry.

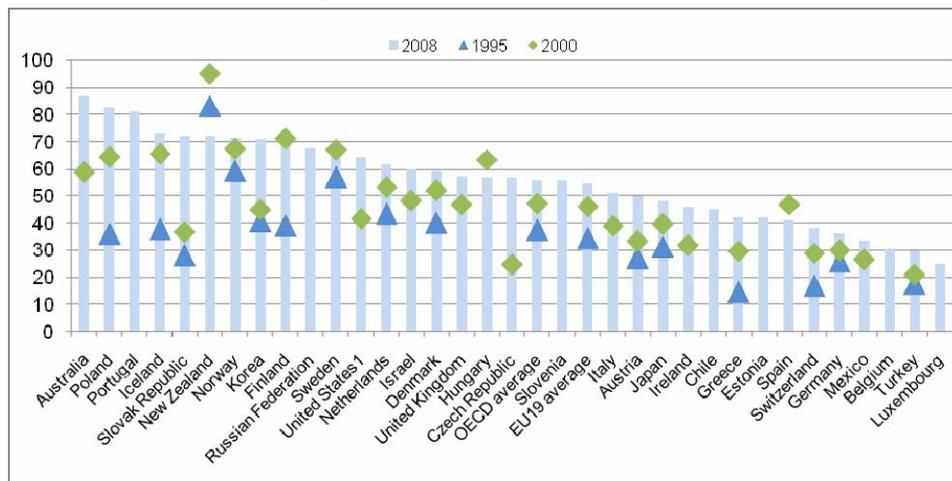
On the other hand, wages in a market economy are created according to the supply and demand relations on the labour market. The level of skills appears to be an important factor determining the wage of an individual. Human capital

theory claims to describe and explain these mechanisms fairly well. After 1989 the accessibility of tertiary education has grown and so did the supply of tertiary educated workers available on the labour market. The basic assumption is that the increase in the numbers of tertiary educated workers should press overall returns to education down.

The increase in tertiary education availability after 1989 was exceptionally steep also from the international perspective. The entry rates into tertiary education have more than doubled between 1995 and 2008; with the most of the growth happening after 2000, mostly driven by a sharp decrease of the young age cohorts.

Graph 1

Entry Rates into Tertiary-type A Education (1995, 2000 and 2008)



Notes: The entry rates for tertiary-type A programmes include the entry rates for tertiary-type B programmes. Countries are ranked in descending order of entry rates for tertiary-type A education in 2008.

Source: OECD (2010); Table A2.4.

Because they have experienced central planning, keeping the tertiary education entry rates on an unnaturally low level, the middle European post-socialist countries are dealing with and exceptionally intense tertiary education expansion. Among the OECD countries, the pattern and extent of this change in Slovakia can be compared with Poland. Czech tertiary education expansion is lagging behind Slovak and Polish. Hungary offers a totally different pattern, with decrease in returns to education.

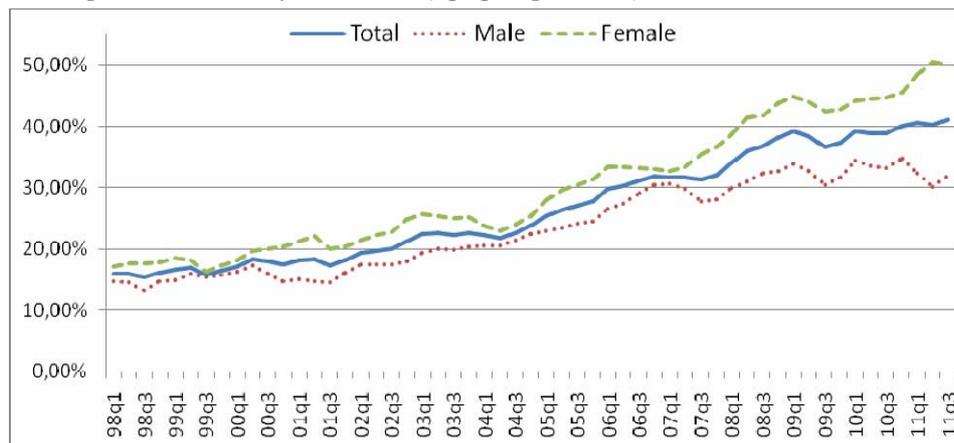
In case of Slovakia, the character of the expansion is mostly spontaneous. The quality criteria for provided education are often vague, what enables wide creation of new study programs and whole educational institutions. On the other

hand, existing institutions are financed universally according to one criterion-number of students. This has inflated the numbers of students in existing study programs. Many local authors point on this spontaneity in case of Slovakia (ARRA, 2009; ÚIPS, 2008; Šprocha, 2009).

An alternative way of looking at the educational expansion is following individual participation in tertiary education. Labour Force Survey data allow us to follow declared individual participation in tertiary education. The table below shows the proportion of individuals between 20 and 24 years old participating in tertiary education. In case of girls, the proportion climbed up to 50%. This means that in 2011 half of the girls from the reference age group declared to be a student in tertiary education. This proportion almost tripled during the period 1998 – 2011, from 17.15 to 50.17%. Male participation grew from 14.74 to 32.04%.²

Graph 2

Participation in Tertiary Education (age group 20 – 24)



Source: The Statistical Office of the Slovak Republic, Labour Force Survey.

The question is whether the tertiary education expansion has influenced the development of overall private returns to education. In the situation of increasing supply of tertiary educated we can expect the value of education, measured as overall private returns to education, to be declining. If we simply consider human capital to be a regular good, an increase in its supply should press its price down. In contradiction, there is some evidence, also from Slovakia pointing that the increase in supply of tertiary educated can create spillovers, when

² Entry rates are just a simple ratio of the number individuals entering education to the reference age group 2. Individuals may enter education in any age, which is why the entry rates from 2008 are over 70% but the participation only around 35%.

looking on occupational allocation (Lovasz and Pertold-Gebicka, 2011). As occupational location can be viewed as the other side of the same coin, speaking about the value of education, we could possibly expect some spillover effects also when looking at returns to education. On the other side increased inflow of higher numbers of tertiary educated workers just started to increase the overall supply of tertiary educated labour. We can also expect some time lag in the reaction of the market on this changing situation. These are reasons for which we believe it might be interesting to look at the development of private returns to education.

Data and Methodology

Most of the analyses behind this article were done on Slovak data from Community Statistics on Income and Living Conditions (EU-SILC). Microdata from this survey were available yearly from rounds 2005 to 2010.³ The rounds always refer to a time period of the last calendar year. This means for example, that the 2005 round data refer to the time period from 1st January 2004 to 31st December 2004. All figures older than 2004 were obtained from two previous studies. None of these studies used data from EU-SILC. The study by Chase (1997) used data from Social Stratification Survey realised in 1984 and a multi country comparative study called *Social Stratification in Eastern Europe 1993*. The figures from 1995 to 2002 were obtained from (Flabbi, Paternostro and Tiongson, 2008) using International Social Survey Programme data.

All the figures are obtained from sample surveys. Administrative data on income present an alternative information source on wages. This is in Slovakia picked up on behalf of the Ministry of Labour, Social Affairs and Family. This data source is today called the *Information System on Average Earnings*. Sample surveys present a significantly smaller sample. On the other side, they can avoid some systematic biases linked to gathering of administrative data; as for example resulting into underrepresentation of smaller companies. Sample size limitations can draw some representativeness questions when splitting the sample into too small subgroups. Nevertheless EU-SILC presents a well developed tool to acquire representative information on income. We have tested its consistency with Labour Force Survey, which presents a well established source of information on labour force structure, with a much broader sample yearly used to update information from Census. All one way tables on the crucial characteristics involved in the

³ For more information on methodology of the survey see: <http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/publication?p_product_code=2005-S-116-114302>.

analysis showed to pass the Chi-square test on goodness of fit.⁴ Detailed results of this analysis can be found in the web annex.⁵

Despite the fact, that all our figures were produced from sample survey data, these surveys differ slightly in the methodology and definitions they are using. We should bear in mind, that differences between data sources present a source of possible bias when analysing time series.

To answer the research questions, the classical formulation of the regression equation introduced by Mincer (1974) was used:

$$\ln(W) - \beta_0 + \beta_1 \text{schooling} + \beta_2 \text{Exp} + \beta_3 \text{Exp}^2 + \beta_4 \text{Male} + \varepsilon$$

where the logarithm of wage ($\ln(W)$) is set as dependent variable. Independent variables are: years spent in schooling ($Y_{\text{schooling}}$), possible experience (Exp), possible experience squared (Exp^2) and a dummy for gender ($Male$). Coefficient β_1 basically quantifies the change of wage related to one year spend in schooling and presents the value of returns to education. We have chosen the simplest formulation of the equation to achieve comparability between studies. For the same reason, we have lost the possibility to control for contextual effects, such as region or economic sector. The possibility to look at the development of returns to education is crucial for answering the research question behind this article, for this reason we abandon the possibility of controlling for context variables.

Various deformations can be possibly caused by different definitions and methodology used in three different surveys employed to construct the time line presented below. We should bear in mind the possible breaks caused by data heterogeneity.

The most obvious differences are in the definitions of dependent variable. Chase uses “net earnings from the respondent’s only reported job, measured in Crowns per month“ (Chase, 1997). The ISSP is asking for current monthly net income from all jobs also including rents and social benefits. In case of EU-SILC data, we have used the information on average⁶ monthly gross income from work.

Years of schooling were picked up by a direct question only in case of the ISSP data. Chase, as well as this study derives the assumed years spend in schooling based on the level of education.

⁴ For gender the significance level was 0.1; for age, region, education level, occupation or economic sector the significance level was 0.01.

⁵ <http://www.ekonom.sav.sk/uploads/journals/Stefanik/annex2/index_1.htm>.

⁶ Average from the whole one calendar year reference period, with the exclusion of moths out of employment.

Possible experience is in all three datasets counted from age minus years of schooling and six, which is the supposed age of entering schooling. This is done to achieve as much homogeneity as possible homogeneity, despite the fact that various datasets offer more precise measurements of work experience which are not comparable.

The equation was estimated on data for all working population. The study employing ISSP data (Flabbi, Paternostro and Tiongson, 2008) excludes self employed persons. Chase (1997) reports returns to education of men and women separately.

Findings

Looking at the development of private returns to education measured by the application of the basic Mincerian regression equation brings supporting evidence for the approaches pointing out the effect of transition. During the Eighties and early Nineties, private returns to education in Slovakia were growing. This was probably a result of the changing settings between central planned economy, with preferences towards secondary education, and market economy.

Table 1

Regression Coefficients and Standard Errors

Data	SSS*		SSEE**	
	1984		1993	
<i>Intercept</i>	7.28 NA	6.84 NA	7.52 NA	7.12 NA
<i>Years of schooling</i>	0.028 NA	0.044 NA	0.049 NA	0.054 NA
<i>Experience</i>	0.036 NA	0.023 NA	0.025 NA	0.025 NA
<i>Experience Squared/100</i>	-0.071 NA	-0.04 NA	-0.054 NA	-0.05 NA
<i>Male</i>	Male	Female	Male	Female
<i>N</i>	2 131	1 992	1 776	1 492
<i>R-squared</i>	0.25	0.18	0.19	0.23

Notes: All coefficients are significant at the 0.05 level. * Social Stratification Survey 1984. ** Social Stratification in Eastern Europe 1993.

Source: Chase (1997).

The effect of the transition period disappeared relatively early, as we can follow a rather stable trend after 1995. The ISSP data offer the possibility to look at private returns to education in Slovakia between 1995 and 2004. (Flabbi, Paternostro and Tiongson, 2008) reports only the coefficients of returns to education for ISSP rounds 1995 to 2002. We have calculated the figures for 2004 to make possible comparisons of different data sets, as EU-SILC also gives information for the reference period 2004.

Table 2
Regression Coefficients and Standard Errors

Data	ISSP				
	1995	1998	1999	2002	2004 – AC*
<i>Year</i>					
<i>Intercept</i>	NA	NA			7.845 0.181
<i>Years of schooling</i>	0.061 0.007	0.066 0.007	0.059 0.006	0.061 0.007	0.068 0.012
<i>Experience</i>	NA	NA	NA	NA	0.02 0.009
<i>Experience Squared/100</i>	NA	NA	NA	NA	-0.04 0.000
<i>Male</i>	NA	NA	NA	NA	0.267 0.057
<i>N</i>	NA	NA	NA	NA	348
<i>R-squared</i>	NA	NA	NA	NA	0.185

Notes: All coefficients are significant at the 0.05 level. * Author's calculations on ISSP microdata.

Source: Flabbi, Paternostro and Tiongson (2008); author's calculations using ISSP microdata.

Therefore we have two figures for 2004; ISSP gives the value 0.068; while EU-SILC 0,061. The difference between figures reported from various datasets can be caused by differences in used definitions, but also by the character of sample surveying, which provides values with a certain bias. Despite the fact that the reference period was the same, the sample was different. Due to this we cannot even assume, that EU-SILC is systematically measuring values below the values measured by ISSP; 0.068 is also the highest value of the coefficients during the whole “flat” period 1995 – 2009; 0.061 presents the most frequent value during the “flat” period, reported from ISSP, as well as EU-SILC data.

Table 3
Regression Coefficients and Standard Errors*

Data	EU-SILC					
	2004	2005	2006	2007	2008	2009
<i>Year</i>						
<i>Intercept</i>	8.280 0.044	8.256 0.046	8.379 0.044	8.448 0.042	5.182 0.039	8.629 0.042
<i>Years of schooling</i>	0.061 0.003	0.065 0.003	0.062 0.003	0.063 0.003	0.062 0.002	0.061 0.002
<i>Experience</i>	0.019 0.002	0.018 0.002	0.021 0.002	0.019 0.002	0.016 0.002	0.018 0.002
<i>Experience Squared/100</i>	-0.044 0.000	-0.040 0.000	-0.046 0.000	-0.043 0.000	-0.037 0.000	-0.042 0.000
<i>Male</i>	0.301 0.013	0.261 0.013	0.284 0.013	0.291 0.012	0.259 0.011	0.258 0.012
<i>N</i>	6 389	6 119	6 174	6 977	6 906	6 835
<i>R-squared</i>	0.147	0.132	0.149	0.149	0.16	0.143

Notes: All coefficients are significant at the 0.05 level. * More detailed results can be found in a web annex at: <http://www.ekonom.sav.sk/uploads/journals/Stefanik/annex2/index_2.htm>.

Source: Author's calculations using EU-SILC microdata.

EU-SILC data draws a similar picture also for the period 2004 – 2009, with private returns to education on the level 0.061 for the beginning as well as the end of the reference period.

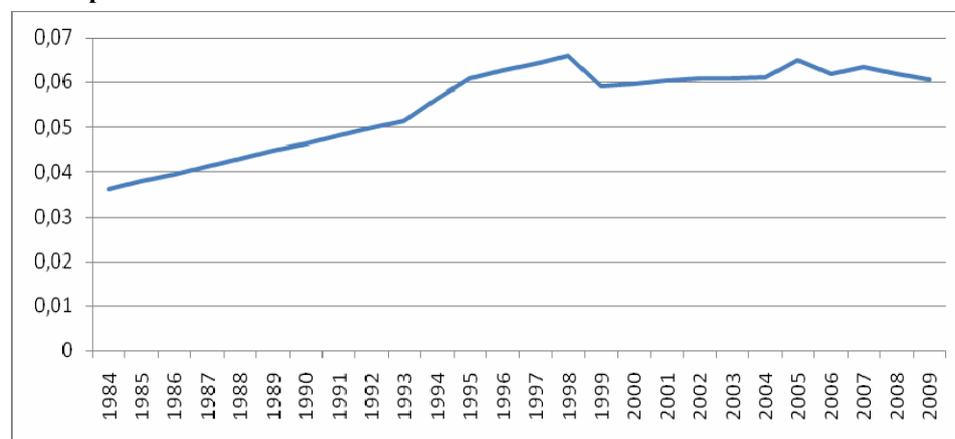
Even if we consider the differences in the character of the ISSP and EU-SILC data (2005 – 2010) to be severe, we have two homogenous separate time lines (1995 – 2004 and 2004 – 2009) both showing the same flat trend. This presents a sufficient evidence to believe, that the overall private returns to education in Slovakia after 1995 were flat.

The coefficients for experience showed an inverse trend, as they have fallen down from 1984 to 2004 and remained around 0.02 after 2004.

The central conclusion drawn from this development is that there is no reaction of private returns to education on the tertiary education expansion. Despite the fact, that numbers of university students and graduates have grown rapidly, the private returns to education in Slovakia are remaining flat. The only change is observable in the beginning of the reference period, with growth resulting from the transition from central planned to market economy. The Graph 3 brings a visual display of the development of returns to education in Slovakia.

Graph 3

Development of Returns to Education in Slovakia



Source: Chase (1997); Flabbi, Paternostro and Tiongson (2008); author's calculations using EU-SILC microdata.

Conclusions and Discussion

This article focuses on returns to education in the context of tertiary education expansion. Using the commonly accepted methodology developed by Mincer (1974) allows comparing acquired results with earlier studies. Nevertheless, the comparisons are limited by the differences in used micro data.

Looking at the long term development in private returns to education we can basically conclude two main points. Firstly, the returns were growing during the Eighties and in the first half of the Nineties. This development is consistent with the literature on wage determinants in the transition period. (Večerník, 2009). We can assume that this rise in private returns to education can be linked with the transition from centrally planned to market economy, with the value of education being reassessed by an unrestricted labour market. Consequently, we can observe the private returns to education to be stable after 1995. This means, that the tertiary education expansion has not, until 2009, been visible in the development of overall private returns to education in Slovakia.

Nevertheless, when looking at private returns to education of various age groups a diverging trend can be observed. Another study Štefánik (2011) using EU-SILC data shows, that the private returns to education of persons under 45 years are flat, but those of persons over 45 are growing. Tertiary education expansion, by increasing the supply of young tertiary educated workers, puts pressure on growth of returns to education of older workers. At the same time, the overall private returns to education remained stable.

The question put by this article is answered by looking at the development of returns to education. The observed pattern of change answers the question, whether the effects of tertiary education expansion influenced the value of education measured as private returns to education. As far as the overall returns to education are flat, there is no direct effect of tertiary education expansion observable.

The character of this analysis, when the pattern of change is observed, offers some space to abstract from contextual effects such as the influence of region, or economic sector on the income of individuals. Returns to education are counted on the basic level using the simplest formulation of the Mincerian wage regression. We assume that the contextual effects do not have a significantly deforming influence on the pattern of change of overall returns to education. For the same reason we also did not deal with the problem of endogeneity of schooling.

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