THE INFLUENCE OF EDUCATION AND EDUCATIONAL HOMOGENEITY PARTNERSHIPS ON THE RISK OF POVERTY

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Abstract

Education plays an important role in the quality of life. It affects not only social status but also the revenue and the related risk of poverty. This article aims to analyse the effect of education on income of persons, particularly the role of education on location in decile income distribution. Distribution is analysed from the perspective of gender, age and education. The second objective pursued is the distribution of persons under the poverty line, particularly whether poverty rate affects the person lives in a multi-household or whether the person has a partner. Under this objective was determined the structure of relationships by highest level of education, i.e. do people look for partners with similar education? And do these relationships affect the income and the risk of poverty?

Key words: risk of poverty, education, partnership, distribution of household income

JEL Code: E24, I24, I32

Introduction

It is known that education nowadays affects a lot of aspects of human life and society. For this reason, the number of graduates with higher education is still growing (Mazouch, Vltavská, 2014). Positive impact of education confirm many studies in different areas e.g. positive relations between education structure and development of regions we can see in Fischer, Mazouch (2010) or education can be monitored as a future investment (Finardi, Fischer, Mazouch, 2012).

Education and its impact on the standard of living is now very often examined. The possible relationship was already envisaged by Ribich (1971) who sees solution of the basic problem of eliminating poverty in eliminating the causes of poverty i.e., among others, inadequate education of people. In his opinion, there was no need of assistance with poverty, but helping with education. In support of this idea, so they championed the so called Anti-poverty program. Ladd (2012) and Samson (2013) is engaged in a similar problem analysis,

which follows an inverse relationship - the relationship between the success of students in a study and their social environment from which they come from.

Among other scientists working on the relationship of poverty and education we can appoint Grace (2011), who sees this issue as a political problem. Tarabini (2012) examines the relationship of poverty and education through development projects Poverty Reduction Strategy Papers (PRSPs) and utilization projects across the international organizations dealing with poverty reduction in the world.

The aim of this article is to determine the effect of education not only to the status of persons in income distribution, but also how education influents the risk-of poverty. At the same time we observe impact of the partnership and partner selection for this division. All calculations are based on EU-SILC survey database with individual records of each respondent and those data were analysed.

EU – SILC survey

According Eurostat (2015a) and CZSO (2015), EU - SILC (European Union - Statistics on Income and Living Conditions) survey is concerned with identifying the living conditions in all EU member states. Data from this survey are comparable among EU states. The aim of this investigation is to obtain the current cross-sectional and longitudinal micro-data on income, social exclusion and living conditions. It also monitors the Europe 2020 strategy1, namely to objectively assess the reduction of poverty, which is one of the main objectives of the aforementioned strategy.

The sampling unit is the household. In the Czech Republic, EU-SILC takes place since 2005 under the name Living Conditions / SILC.

For our research essential areas are related to income, poverty and education. Education is explored through contemporary education variables and the highest completed education, which are coded by the International Classification of Education ISCED 1997 (Mysíková, 2011).

ISCED 97 has seven primary education codes labelled 0 to 6. The summary is given below:

For the purpose of this analysis group, education interconnected with only 4 groups where the first group of education "Primary" includes ISCED 0 and 1, group "Secondary

[1] See on http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf

without GCE" ISCED 2, group of "Secondary with GCE" includes ISCED 3 and 4, the last group is Education "Tertiary" involving ISCED 5 and 6.

1 Distribution of income among the whole population

The survey EU - SILC encounters several types of income. Revenues were determined according to the type of work activity, i.e. income from employment, income from business and other self-employment income from ancillary activities, benefits from an employer, other income, social security benefits, tax relief applicable to income (e.g. tax deductible items, tax rebates).

Definition of disposable (net) income of a household survey EU - SILC includes various types of income such as employees' income, income from business and other self-employment income from a second job and secondary activities, income from social insurance and welfare benefits, rental income and financial assets received and paid alimony and financial support outside the home.

These transactions include paid social contributions, social benefits paid in cash, ordinary income tax and national insurance contributions, as well as other current transfers. Disposable income does not include social transfers in kind provided by the public administration or non-profit institutions serving households (Eurostat, 2015b).

1.1 Comparison of income of households with different composition of members

Calculation of household disposable income is based on the scale of consumption units. The reason is to improve the comparability of income level of households of varying composition. On one hand household income, regardless of its composition, is not directly comparable - a household of individual cannot be equated with a family of four with the same income. Yet in the context of multi-household leads to economies of scale, the costs associated with the operation of e.g. four-person households do not correspond to the entire four times the cost of the individual and that of per capita income obtained simply by dividing the number of members does not constitute an ideal basis for comparison between different households.

The European statistics, for purposes of comparison of incomes varying composition of households, use the modified OECD scale with the following factors:

Tab. 1: The modified OECD scale

First adult in the household	1
Another adult (including children from the age of 14)	0,5
Children under 13 years	0,3

Source: Jílek, Moravová (2007)

According to this scale, a household consisting of one individual represents a basis for comparison with the coefficient of 1; household of 2 adults has a coefficient of 1.5, and e.g. a household of four with two children under 13 years coefficient of 2.1 (1.0 + 0.5 + 0 3 + 0.3).

1.2 The estimate of the income distribution

This adjusted income is used to estimate the income distribution and position of individual households and their members in the distribution of income.

Tab. 2: The boundary of deciles of monthly disposable income of people in certain types of households in 2012 (CZK / month)

Decile	Individual	A pair of adult	Couple with 2 children
Consumer unit	1	1,5	2,1
1.	10 108	15 161	21 226
2.	12 016	18 024	25 234
3.	13 405	20 107	28 149
4.	14 763	22 144	31 002
median	**16 124**	**24 186**	**33 860**
6.	17 694	26 542	37 158
7.	19 874	29 812	41 736
8.	22 808	34 212	47 897
9.	28 128	42 192	59 069

Source: data - EU – SILC 2013, own computation

Based on the estimation of the Living Conditions Survey / SILC the first income decile would include individuals with disposable income of less than CZK 10 108, a pair of adults with less than 15 161 CZK per month, a family of four with two children under 13 years with less than 21,226 CZK per month.

The estimated half of the income distribution (5th decile - median) would have found individuals with disposable income 16 124 CZK per month, a couple with an income of 24,186 CZK per month or a family of four with two children under 13 years with an income of 33,860 CZK per month.

2 Factors influencing the position of people in income distribution in 2012

Position of persons in income distribution can be affected by multiple factors. For our analysis the following factors were considered: gender, age group and highest level of education. For the evaluation of the threat of poverty is a fourth factor is considered, this factor being partnership, i.e. whether the person lives in a household with or without a partner.

Analysis of the people in the income distribution builds on already established deciles. The existence of a relationship and dependence between the observed factors and dividing people into deciles were monitored by χ square test in the contingency table, (e. g. Marek 2013,

pp 193 - 194). For assessing the strength of the existing dependence Cramér contingency coefficient, for short Cramer's V, was chosen (Marek, 2013, pp 195).

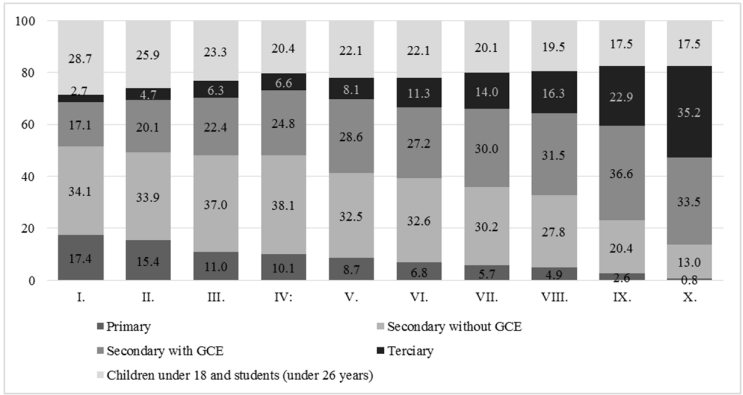
Results

Statistically, the most important factor affecting the positioning of the income distribution is the highest completed education ($\chi 2$ test in contingency table, p-value of 0.000, Cramer's V = 0.213). For the purposes of this analysis, the data were adjusted for children under 18 and students under 26 years of age, at which it is assumed that education is not yet complete. These persons were placed in their own category "Children under 18 and students (under 26 years)." Results are displayed on Fig. 1.

Persons with the lowest - primary - education are most often found in the lowest income groups – I. to III. decile. In the first decile, 17.4 % of people have only primary education. With the increasing income, their ratio in the groups decreases. In the highest income group they represent only 0.8 %. This group is the most often represented by women over 50, either working or retired and residing in multiple-member households. A similar trend can be found for persons with secondary education without GCE. Their share also decreases with increasing income.

Opposite pattern is represented in secondary school graduates or the highest, tertiary education, which includes graduates from colleges and universities. In the first decile, the proportion of people with this education level is only 2.7 %, and with the increasing income, their ratio in groups increases. In the first decile, this group consists particularly of women aged 25 to 49 years who live in numerous families. They mostly work as self-employed or are otherwise inactive. The highest influence on education placements in the last, highest decile, where the proportion was 35.2 %, i.e. more than 10 times higher ratio than in the first decile.

Fig. 1: Income distribution into deciles according to education in 2012 (%)



Source: data - EU – SILC 2013, own computation

3 Risk of poverty rate in the European statistics

The indicator of the risk of poverty is conceived as a relative measure derived from the middle value - median income distribution in each country. The poverty line is defined as 60 % of the national median disposable income. At risk of poverty are thus regarded people in households whose income level reaches less than 60 % of the income of the middle of the income distribution.

Tab. 3: The median value of disposable income and the poverty threshold for certain types of households in 2012 (CZK / month)

	Median	Poverty threshold (60% of median)
Single person	16 124 CZK per month	9 674 CZK per month
Couple of adults	24 186 CZK per month	14 511 CZK per month
A pair of adults with two children under 13 years	33 860 CZK per month	20 315 CZK per month

Source: EU – SILC 2013, own computation

Women are often more vulnerable to poverty (9.4 %) than men (7.7 %), among age intervals, the most vulnerable group of persons are those younger under 24. Regarded by education, the most vulnerable group are persons with primary education (18.2 %) or those who have finished secondary school (9.8 %). The least vulnerable group are men aged 25 to 64 with tertiary education. A special group of children under 18 and students under 26 years of age compromised in 11.5 % of cases.

Tab. 4: The share of people below the poverty line in 2012 (%)

		Below the poverty level	Above the poverty line
Total		8.6	91.4
Sex	Man	7.7	92.3
	Woman	9.4	90.6
Age category	under 17 years	11.3	88.7
	18 - 24	11.4	88.6
	25 - 49	8.1	91.9
	50 - 64	8.3	91.7
	65 years and more	5.8	94.2
The highest completed education	Primary	18.2	81.8
	Secondary without GCE	9.8	90.2
	Secondary with GCE	5.3	94.7
	Tertiary	1.8	98.2
	Children under 18 and students (under 26 years)	11.5	88.5

Source: data - EU – SILC 2013, own computation

According to the table 4 we can see that there is a correlation between education of men and women ($\chi 2$ test in a PivotTable, p-value of 0.000, Cramer's V = 0.362).

The following table focuses only on persons who have declared that they live with a partner. In the analysis of education of partners and the threat of poverty, we focused on what couples prevail in the Czech Republic. Whether they are partners with homogeneous education (both partners have the same, or similar, level of education), or whether each partner has a different level of education.

The most common are couples where both partners have secondary education without GCSE (23.6 %) or secondary education (17.7 %). The lowest number of couples consist of a man with only primary education and a woman with tertiary education.

Tab. 5: Percentage of pairs by education partners (%)

		Women			
		Primary	Secondary without GCE	Secondary with GCE	Tertiary
Man	Primary	2.7	1.4	0.8	0.1
	Secondary without GCE	6.7	23.6	14.8	2.0
	Secondary with GCE	1.5	7.5	17.7	4.0
	Tertiary	0.2	1.0	7.7	8.3

Source: data - EU – SILC 2013, own computation

According to the estimates of the Living Conditions (SILC) in the Czech Republic, 52.3 % of couples consist of partners with the same completed education. 42.1 % of couples differ by no more than one level of education. The question remains, however, whether the homogeneity of couple are statistically significant.

For homogeneity measurement categories we used Cohen's κ (kappa). This characteristic is used in square contingency tables that have the same number of rows and columns and can therefore be tested for the level of agreement. For more information see Řezanková (2011, pp 94 - 95).

This coefficient attains its maximum (value 1) when the non-zero frequencies occur only on the diagonal. Values greater than 0.75 indicate excellent agreement, values of less than 0.4 indicate a very poor conformity.

Results for consensus among education partners confirm our assumption about the existence of homogeneity education pairs (p-value 0.000; $\kappa = 0.285$). The minimum level of significance, from which we reject the hypothesis of zero coefficient, says the consensus among education partners is statistically significant. There is, however, very little consensus.

Based on data from the EU - SILC we can estimate the proportion of couples below the poverty line in 2012, according to their education. Most often at risk of poverty are couples where both partners have only primary education (21.4 %) or where the man has only primary education and female has secondary school (19.5 %). Couples have the least probability of poverty where at least one person is tertiary educated. Combination of education of partners in partner households deepens the effect of education on risk of poverty.

Tab. 6: Risk of poverty of pairs (%)

		Women				
		Primary	Secondary without GCE	Secondary with GCE	Tertiary	All four categories together
Man	Primary	21.4	19.5	8.9	.	18.6
	Secondary without GCE	6.7	9.1	4.1	1.1	6.8
	Secondary with GCE	7.5	5.5	3.6	0.7	3.9
	Tertiary	.	3.7	1.1	0.6	1.0
	All four categories together	10.3	8.5	3.4	0.7	5.5

Source: data - EU – SILC 2013, own computation

Conclusion

This paper aims to analyse the effect of education on income of persons, particularly on the role of education on the location of the decile distribution of income and the possible threat of poverty. The second goal is to clarify the effect of education on mate choice by education and the impact of education together with the partnership at risk of poverty.

The results correspond to the analysis of other authors who have analysed the possible impact of education on the possibility of the threat of poverty. Based on microdata from the survey EU - SILC, we found out that the highest completed education significantly affects the disposable income of people and thus the location of the income distribution. Based on the division into deciles, we confirmed the hypothesis that people with higher education have higher incomes. At the same time, this division has the effect of gender and age of the study subjects. A risk of poverty rate relates with this distribution of income. Women, persons under 24 years and those with primary education most often face a risk of poverty. People with higher education, especially tertiary, face the lowest risk of poverty

Risk of poverty rate is also strongly influenced by whether a person has or does not have a partner. The second part was therefore focused on the impact of education on mate choice and consequently the effect of education of partners on the risk of poverty. It was also statistically

confirmed that people often choose partners with the same education. Pairs where none of the partners have at least college education are the most often at risk of poverty. We can say that education and related mate choice has an impact on risk of poverty.

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