

# Inequality in educational returns in Hungary

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Is education the great equalizer? Inequality in Educational Returns in 14 countries

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## Introduction: Previous research and motivations

Research on intergenerational social mobility as well as on returns to education has long traditions in Hungary. Already in the communist times, large-scale data collections with observations of ten-thousands of cases, aiming to study these topics have been carried out in the Hungarian Central Statistical Office. The first one for which the micro data are available is from the year as early as 1973; the last one is from 1992.<sup>1</sup> Father-to-son(-daughter)-type mobility analysis by Andorka (1990) reveals marked influence of structural changes behind the observed extensive occupational mobility processes in Hungary. At the same time, social fluidity has also increased, particularly between the time points represented by the data from 1949 and from 1962-64. This means that Hungary has become more open during the period of the communist transformation and the rapid industrialization. This tendency, however, did not continue in the 1970s and onwards. The most recent study on intergenerational class mobility by Róbert and Bukodi (2004) confirms the previous findings, on the one hand, but detects a decrease in social openness in Hungary on the ground of later datasets from 1992 and 2000, on the other hand.

The examination of the role of achieved education in the process of intergenerational social mobility is based on the idea of path models by Blau and Duncan (1967). In the status-attainment models social origin has a *direct effect* on achieved status, on the one hand, and there is an *indirect effect* how social origin influences social status through education, on the other hand. This means that education is an intervening variable in the course of social mobility; in modern societies, it is considered as the main channel of distributing social rewards. In accordance with the industrialization thesis (Treiman 1970), meritocratic principle is an essential driving force in status attainment process. The ‘increased merit selection’ (IMS) hypothesis (Jonsson 1992) claims that merit becomes the key determinant of individuals’ access to education and to social position. This would allow assuming that the impact of social origin on education declines over time, while the effect of education on social position increases over time.

This hypothesis has been tested for several countries. For Hungary, based on the data by the Hungarian Central Statistical Office between 1973 and 1992, the comprehensive paper by Luijkx et al. (2002) applied the classic Blau-Duncan approach of status attainment model and investigated the long-term trends in the effects of social origin on educational attainment as well as in the impact of education on achieved social status. For the previous trend in the effect of father’s occupation and father’s education on offspring’s education (measured in years), they found a marked fall for the influence of father’s occupation for men and a more moderate decrease for women. The impact of father’s education on respondent’s education did not indicate any linear trend over time but turned out more persistent. For the latter trend on status returns to education, the effect of education on respondent’s ISEI score increased

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<sup>1</sup> Even earlier data for which intergenerational mobility tables can be computed exist from the years of 1930, 1949 and 1962-64. In fact, figures in 1930 and 1949 are from the Census but the micro data from these years are not accessible, only published tables can be used (Andorka 1982).

during the decades between the two World Wars and after WW2 in the communist time until the end of the 1960s but started to decline thereafter in the 1970s and 1980s. This curvilinear trend was more marked for women than men.

On the contrary to the argument on the function of schooling outlined above, it is possible to describe the role of education in the status attainment process in a more controversial way. Accordingly, education does not accomplish its task of directing the 'right people to the right place' on the ground of their merits but it rather serves a transmitter of social inequalities between generations. Largely based on the theory of cultural reproduction (Bourdieu and Passeron 1977), the school system is a field where offspring of high status families can benefit from those 'home-based' skills and abilities which are transmitted to them, in fact, by the family. Since parental cultural and educational differences have strong impact on school success and cultural capital is more rewarded by schools than merit (intelligence, diligence), education will legitimate the intergenerational reproduction of social inequalities.<sup>2</sup>

In terms of this second argument on how education can contribute to intergenerational social mobility, Simkus (1981) formulates the assumption that the intervening role of the school system in the status attainment process can probably be stronger in the communist countries as compared to the Western market economies. This is due to the abolishment of means of material inheritance under communism, leading to an upgrade of cultural means for reproduction of inequalities that could have been less controlled by party directives and measures. For Hungary, this assumption definitely holds; previous studies confirmed that education was a major transmitter of social inequalities during the decades of communism (e.g. Ganzeboom, Graaf and Robert 1990).

Turning to the post-communist times, the analysis on the causal sequence of social origin, educational attainment and social position becomes even more relevant research topic due to several reasons. First, the existing trend analyses provide little information either on the impact of social origin on level of schooling or on the impact of education on social status, i.e. the returns to educational investments. An important exception in this regard is the study on Hungary by Bukodi and Goldthorpe (2010). The paper has a strict class approach based on father's class and respondent's class taking into account respondent's education as an intervening variable. Based on Central Statistical Office data, it investigates the OED (origin-education-destination) triangle expanding the time span of the analysis until 2005. The authors find a return in the decreasing trend for the origin-education (OE) association for the post-communist times. The ED association turns out to be also weaker under post-communism as compared to the communist period. This is what the authors interpret as a decrease in meritocracy under the market conditions in Hungary. Finally, the trend in class mobility, the OD association shows a reversal as well; it becomes stronger for post-communism. Hence, the study finds the trend detected by Róbert and Bukodi (2004) to be continued over time. Furthermore it is in accordance with the findings by Luijckx et al. (2002) – even if the interpretation of the results on the decline of meritocracy is different. Results from analyses based on other cross sectional data sources after the collapse of communism also reveal significant effect of social origin on occupation and earnings even after controlling for education (Blaskó and Róbert 2007. Bukodi and Róbert 2011).

Second, post-communist transformation and the emerging market economy in Hungary brought a fundamental change in the school system as well as in the reward system related to social standing, i.e. in the returns to education.<sup>3</sup> The school system has become much more stratified; segments of private and church-run schools have been re-established; costs of participation in schooling, particularly at tertiary level have significantly increased. In

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<sup>2</sup> This occurs through so-called primary and secondary mechanisms (Boudon 1974. Goldthorpe 1996) but the present analysis does not deal with these details of the process.

<sup>3</sup> Here we provide a brief summary of the processes from the perspective of our research motivation. For more details see Bukodi and Róbert (2008).

consequence of this last development, the previous claim that educational attainment is based on cultural capital holds less in Hungary, parental financial background begins to matter increasingly (Bukodi 1999). A further development is the considerable educational expansion that has taken place in Hungary, again predominantly at tertiary level. This is a worldwide tendency because educational expansion is connected to the globalization of the school systems and of the labor markets, to democratization and liberalization of the modern societies, to the declining state control over education and labor (Schofer and Mayer, 2005) and this tendency began to appear in Hungary, too, after the collapse of communism. At the same time, Becker and Hadjar (2009) call the attention to some unexpected consequences of educational expansion, namely a possible decline in the returns to human capital investments.

Due to the stronger horizontal differentiation in the school system as well as the expansion in education, credentials and formal degrees at the same, secondary or tertiary level can be the outcome of different educational investments or school choices. This means that returns to education have altered to substantial degree. Under communism, the major form of educational returns was related to class position or occupational status. Status returns, i.e. higher level of schooling led to higher level of class or occupational position were dominant since income returns to educational investments could not be realized given the low level earning differences in Hungary under communism (Kornai 1992: 316-18). Consequently, the direct effect of education on occupation was strong and this was regarded as meritocracy – though the strength of association was partly an outcome of the regulated school-to-work transition under the command economy and these regulations have apparently disappeared after the collapse of communism. The structural and legal changes have probably contributed to the decrease in the effect of education on occupation.

Contrary to status returns, wage returns to education have definitely increased under market conditions in Hungary as shown by economists (Kertesi and Köllő 2002, 2005). This makes highly relevant to study both occupational returns in terms of ISEI and income returns, the wage premium of higher levels of schooling. Both research issues are particularly interesting from the perspective of changes over time. Time effects are influenced by the market transformation partly in terms of alterations in the school system, chiefly the rising differentiation and expansion in education, partly in terms of modifications in the expectations of employers in the labor market. In this regard, Róbert (2009) detects signs of diploma inflation, a decrease in returns to schooling in terms occupational status (ISEI), while wage premium connected to higher level of education seems to persist. Gáti and Róbert (2012) also found a decline in class returns to education for indicators like access to the salariat or avoiding a worker class destination. Kolosi and Keller (2012) report the direct effect of social origin on occupation to be constant but the indirect effect of social origin on occupation through education to increase. For returns to education, the direct effect of education on salaries turned out to be quite stable though the wage premium of higher educated people has slightly declined after 2003 in consequence of expansion at tertiary level. The correlation between education and occupation is still quite high but a trend appears that higher educated people gradually drive out lower educated ones from certain occupational positions leading to a decrease in the effect of schooling on occupation.

The present study intends to elaborate further on these research issues. In particular four research questions will be investigated: (1) Is there a direct effect of social background on labor market success over and above the effect of own education? (2) Does the effect of social background vary depending on the level of education achieved and, more precisely, is it weaker among those with higher education? (3) Has the direct effect of social background declined over time? (4) Have the returns to education in the chances to be successful at the labor market varied over time?

In the next sections first we describe the data, variables and the methods applied. Then we present our results on the status and wage returns to education taking social origin into

account and putting the emphasis on changes over time. The paper ends with a discussion of the findings.

### **Data, variables and methods**

Most of the previous analyses on long-term trends in intergenerational class mobility or in status attainment are based on the data conducted by the Hungarian Central Statistical Office at various times, between 1973 and 2005 (Luijkx et al. 2002. Róbert and Bukodi 2004. Bukodi and Goldthorpe 2010. Gáti and Róbert 2012). One feature of the CSO data is that the number of observations is huge for 1973, 1983 and 1992 (above 30 thousand cases) and relatively smaller for 2000 and 2005 (maximum 10 thousand cases). Another problem for the present study is that the CSO data do not contain information on income. Regarding occupation, respondents report about first job in the 1973, 1983 and 1992 surveys but not in the 2000 and 2005 surveys. Since the analysis on income returns to education was crucial, we turned to a different data source, we use ISSP data. The ISSP work module has earlier been used by Róbert (2009) for analyzing status and income returns to education but no information is available on parents in the data. This is why we use the ISSP inequality module data from four surveys in the years of 1987, 1992, 1999 and 2009. The data are based on probability samples of the Hungarian population aged 18 years and above and face-to-face interviewing method was used.

After matching the four datasets and selecting respondents aged 28-65, we ended up about 4200 valid cases for predicting occupation and about 3700 valid cases for predicting earnings. One limitation of the data is that both occupation and earnings refer to the current situation of the respondents. Consequently, the period effects (changes over time) we are investigating are shaped by the ageing effect being present in the data. Apparently, we control for age and age-squared in the models in order to diminish this problem to some extent. Furthermore, we repeated our analysis for a younger group of respondents, aged 28-45, in order to re-examine the major results on the trends over time for a population where the ageing effect is reduced. (Observations go down to about 2500 valid cases for predicting occupation and to about 2300 cases for predicting earnings.) Another way to test our results is if we focus only on those respondents who are currently in the labor force. Some models are fitted to an alternate dataset where we merged the TARKI Monitor surveys. These data were also used by Kolosi and Keller (2012) earlier. Number of cases is larger in the TARKI data and income is probably measured in more reliable manner but the data are not appropriate for the purpose of the study because information on parents is not available. Models were calculated including both men and women but also separate for men and women.<sup>4</sup>

The most important predictor variables in the analysis are father's occupation and respondent's highest level of education. For father's occupation, detailed (4-digit) occupational coding allowed to construct the ISEI scale. For respondent's education a four category scale was constructed: elementary (primary) level of schooling and below (the reference category), low secondary (vocational training, no eligibility to continue at tertiary level), high secondary school (eligibility to continue at tertiary level), tertiary level (college or university degree). With respect to the dependent variables of the analysis, respondent's current occupation was coded in a detailed (4-digit) manner and the ISEI scale was constructed from these codes. For income, data contained net earnings and the logarithm of these earnings are predicted in the models. In order to capture the changes over time, dummies of the survey years are used (1987 is reference). In this way, we analyze processes for the returns to education and the impact of social origin basically in contrast to the last stage of the communist times (1987). Then, we are able to distinguish between three phases of the post-communist era: early transformation (1992), mature transformation (1999) and

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<sup>4</sup> There is no room to show all these analyses. We refer to the results in the text. Tables and estimates are available from the authors.

consolidated transformation (2009). In time we go beyond any previous analysis, the last data point refers to a time point nearly 20 years after the collapse of communism. Table 1 summarizes the descriptive statistics of the variables in the analysis.

Table 1.  
Descriptive statistics of the variables in the analysis (Respondents aged 28-65)

	Communist times (1987)	Early transformation (1992)	Mature transformation (1999)	Consolidated transformation (2009)
Father's ISEI mean (std)	29.9 (14.4)	30.5 (14.6)	33.1 (13.6)	33.5 (14.1)
Education (%)				
- elementary	53.6	42.1	37.8	27.6
- vocational	16.5	26.1	27.4	29.1
- high secondary	20.6	23.7	24.1	30.9
- tertiary	9.2	8.1	10.7	12.4
ISEI mean (std)	37.5 (15.9)	36.1 (15.1)	39.1 (14.8)	38.5 (14.8)
Ln (earnings) mean (std)	8.7 (0.5)	9.2 (0.5)	10.4 (0.6)	11.3 (0.6)
Pct. of males	43.9	47.4	46.9	46.5
Age	45.6	46.5	46.3	47.2
Observations	2606	1250	1208	1010

Source : ISSP Hungarian data files

We use STATA for predicting status and wage returns to education. In the models main effects are presented and interactions are used to answer the research questions, like the impact of social origin by levels of education or the changes over time. We report unstandardized B coefficients from OLS regressions with robust standard errors.

### Status and income returns to education

This main section presents the results from the empirical analysis. We go through the four research questions one by one and display the effects of the predictor variables on ISEI and earnings. Thus, both status and income returns are investigated together in the sense that occupation and earnings represent two (interrelated) sides of social standing. This way the two types of returns to education can also be confronted to each other.

#### *1. The direct effect of social background on labor market success*

The estimates displayed in Table 2 disclose significant positive impact of father's ISEI on respondent's ISEI and earnings for respondents aged 28-65 (Model 1). These effects become smaller but persist when controlled for level of education. Apparently, higher levels of schooling show increasing returns in terms of occupation and earnings (Model 2). These patterns hold if the models are estimated for respondents aged 28-45. The magnitude of the coefficients is bit smaller in the equation on earnings. For occupation, the age effect displays a reversed U-curve; ISEI rises as respondents are getting older (positive effect) but the increase levels off (negative quadratic term). The pattern disappears when controlled for education. Findings are just the opposite for earnings. The age effect is significant only if returns to education are taken into account. The main effect is negative, younger (and better educated) respondents earn more but the effect is of U-shaped, the estimate for the quadratic term of age is positive. This pattern for age is not present when younger respondents aged 28-45 are analyzed. There is an opposite gender effect for occupation and earnings. Women work in jobs with higher ISEI (chiefly in non-manual jobs) but males have higher wages than females in line with the usual gender gap in earnings. The results are basically same when

ISEI is predicted separately for men and women. In the models on earnings, the estimates for father's ISEI and education do not differ either. The U-shaped pattern for the age effect is present for females but not for males. Thus, being younger (and better educated) matters more for women than men.

Table 2.

The effect of social origin on occupation and earnings (age selection: 28-65)

Unstandardized coefficients, robust standard errors in parentheses

	ISEI Model 1	ISEI Model 2	Ln(wage) Model 1	Ln(wage) Model 2
Father's ISEI	0.388*** (0.018)	0.060*** (0.020)	0.018*** (0.001)	0.013*** (0.002)
Education				
- elementary		ref		ref
- vocational training		6.741*** (0.494)		0.698*** (0.059)
- high secondary		16.206*** (0.609)		0.642*** (0.063)
- tertiary		30.608*** (0.978)		0.914*** (0.098)
Age	0.501*** (0.116)	0.021 (0.113)	0.002 (0.011)	-0.033** (0.013)
Age squared	-0.006*** (0.001)	0.000 (0.001)	0.000 (0.000)	0.001*** (0.000)
Male	No	-1.815*** (0.429)	No	0.250*** (0.047)
Constant	16.659*** (2.312)	25.038*** (2.459)	8.655*** (0.215)	8.768*** (0.292)
Type of settlement dummies	No	Yes	No	Yes
County dummies	No	Yes	No	Yes
Observations	4284	4281	3707	3706
R-squared	0.136	0.456	0.066	0.204
F-stat	174.2	75.57	76.57	28.27
p-value	0.00	0.00	0.00	0.00

Source : ISSP Integrated Hungarian data files: 1987, 1992, 1999, 2009

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 2. Variation in the effect of social background by level of education

In Table 3 in column 1 and 3, Model 3 is added to equations referring to occupation and earnings, respectively. Model 3 contains the interaction terms between social origin and levels of education to both equations. For occupation, the interactions disclose significant negative estimates for father's occupation on respondent's occupation if they have vocational training or high secondary education (that makes entrance to tertiary level of schooling eligible). This means that better social origin compensates the effect of lower education; social background has bigger positive effect on respondent's occupation if they are uneducated (schooled at elementary level) and, therefore, cannot expect status returns to education. This compensation pattern is not significant statistically if the respondent is graduated at tertiary level. Thus, the effect of social background on occupational status shows no linear decline as respondents have higher levels of schooling. For earnings, the influence of social origin does not vary by level of education. However, if only those respondents being currently in the labor force are considered, the similar negative interaction terms for higher levels of schooling appear in contrast to elementary education. Thus, better social origin compensates the lower educated for missing wage returns, too, if they are able to avoid a negative selection by being out of the labor market. The U-shaped age effect described above for the model on earnings is very

weak. Variation on selection for respondents aged 28-45 does not make difference for this research question. The opposite effect of gender in terms of status advantage of women and earnings advantage of men persists. Running the models separately for men and women does not change the results for the interaction between social background and level of education. The previously mentioned gender difference, namely that the U-shaped age effect is stronger for women, is present in Model 3, as well.

### *3. Change in the effect of social background over time*

The results for this research question appear in Table 3; Model 4 in column 2 and 4 displays the estimates for occupation and earnings, respectively. The interaction terms between father's occupation and the four periods represented by the four survey dates are insignificant in the model predicting respondent's occupational status. As compared to the last stage of communism at the end of the 80s, there seems to be no change (increase) in the effect of social background on occupational status. On the contrary, when predicting earnings, estimates reveal significantly stronger effects of social origin for the transformation times as contrasted to the communist era.<sup>5</sup> However, in Model 4, the direct effect of social background on earnings is not significant anymore. Furthermore, the magnitude of the coefficients for education becomes definitely smaller in the equation for earnings, though the pattern for higher returns connected to higher levels of schooling persists. The coefficients for education change hardly in Model 4 for respondent's ISEI. A further interesting modification in Model 4 on earnings refers to the age effects. They turn to the opposite and take a reversed U-shape. There is a positive age effect on earnings and this rise by age levels slightly shown by the weak negative effect of the quadratic term of age. This change in the pattern is more marked when the model on earnings is fitted to the respondents aged 28-45 or to the respondents being in the labor force. When analyzing the data separately for men and women, the change of the age pattern on earnings is stronger for men than women.

### *4. Change in the returns to education at the labor market over time*

Table 4 displays the estimates for Model 5 where the interaction terms between levels of education and the four period dummies are added to the equations. All of these interactions are completely insignificant for the model predicting respondent's occupational status. Similarly to what we found for social background, the impact of education on ISEI did not change over time from the late 80s until 2009 the latest time point our data cover. Nevertheless, the previous findings hold: there is a significant direct effect of social origin on respondent's occupational status; there are significant social returns to education, respondents with higher level of schooling work in jobs with higher ISEI score. Also better social origin compensates the missing status returns for those who are uneducated and completed only primary school. These results do not vary even if Model 5 is fitted to the data of respondents aged 28-45 or men and women are analyzed separately. However, when the education by period interaction terms are investigated on the TARKI-Monitor data, we found significant negative effects for the more recent transformation times in contrast to the communist era. This means that there is a decrease, indeed, in the status returns to education over time; respondents with higher level of school end up in jobs with lower ISEI score than before the collapse of communism.<sup>6</sup>

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<sup>5</sup> There is an inflation in Hungary in the national currency over time and this has an influence on the results.

<sup>6</sup> Four datasets from 1982, 1992, 2009 and 2010 are merged in these TARKI-Monitor data. Number of observations is above 18 thousands, results may be more robust. The model does not contain the direct effect of social background (there is no father's occupation in the data) and the interaction terms between social background and period. This is a limitation for comparing results from the two different data sources.

Table 3.

The effect of social origin on occupation and earnings by levels of education (Model 3) and the changes in the effect of social origin over time (Model 4) (age selection: 28-65) Unstandardized coefficients, robust standard errors in parentheses

	ISEI Model 3	ISEI Model 4	Ln(wage) Model 3	Ln(wage) Model 4
Father's ISEI	0.161*** (0.036)	0.173*** (0.035)	0.012*** (0.003)	-0.001 (0.001)
Education				
- elementary	ref	ref	ref	ref
- vocational training	10.301*** (1.285)	10.985*** (1.289)	0.637*** (0.125)	0.218*** (0.055)
- high secondary	20.468*** (1.361)	20.840*** (1.356)	0.714*** (0.122)	0.370*** (0.053)
- tertiary	30.702*** (1.836)	31.184*** (1.823)	1.043*** (0.337)	0.618*** (0.218)
Father's ISEI * Education				
- elementary	ref	ref	ref	ref
- vocational training	-0.134*** (0.045)	-0.136*** (0.045)	-0.002 (0.004)	-0.002 (0.002)
- high secondary	-0.152*** (0.043)	-0.149*** (0.043)	-0.005 (0.004)	-0.003** (0.002)
- tertiary	-0.032 (0.048)	-0.035 (0.047)	-0.005 (0.004)	-0.001 (0.002)
Period				
- late communism (1987)		ref		Ref
- early transformation (1992)		-1.466 (1.197)		0.474*** (0.043)
- mature transformation (1999)		-0.153 (1.218)		1.553*** (0.063)
- consolidated transformation (2009)		-4.077*** (1.251)		2.300*** (0.063)
Father's ISEI * period				
- late communism (1987)		ref		ref
- early transformation (1992)		-0.023 (0.038)		0.005*** (0.001)
- mature transformation (1999)		-0.024 (0.035)		0.006*** (0.002)
- consolidated transformation (2009)		0.022 (0.036)		0.008*** (0.002)
Age	-0.040 (0.093)	-0.018 (0.092)	-0.007 (0.010)	0.043*** (0.005)
Age squared	0.001 (0.001)	0.001 (0.001)	0.000** (0.000)	-0.000*** (0.000)
Male	-2.026*** (0.352)	-2.036*** (0.351)	0.292*** (0.036)	0.361*** (0.016)
Constant	26.348*** (2.117)	26.009*** (2.144)	8.523*** (0.233)	7.600*** (0.120)
Type of settlement dummies	Yes	Yes	Yes	Yes
County dummies	No	No	No	No
Observations	4281	4,281	3705	3,705
R-squared	0.482	0.489	0.163	0.841
F-stat	285.8	197.5	59.95	936.2
p-value	0.00	0.00	0.00	0.00

Source : ISSP Integrated Hungarian data files: 1987, 1992, 1999, 2009

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table 4.

Changes in the effect of education on occupation and earnings over time

(age selection: 28-65) Unstandardized coefficients, robust standard errors in parentheses

	ISEI Model 5	Ln(wage) Model 5
Father's ISEI	0.168*** (0.035)	0.001 (0.001)
Education		
- elementary	ref	ref
- vocational training	11.025*** (1.392)	0.172*** (0.058)
- high secondary	21.172*** (1.483)	0.305*** (0.056)
- tertiary	31.965*** (2.036)	0.471*** (0.072)
Father's ISEI * Education		
- elementary	ref	ref
- vocational training	-0.139*** (0.045)	-0.002 (0.002)
- high secondary	-0.149*** (0.043)	-0.004** (0.002)
- tertiary	-0.037 (0.047)	-0.002 (0.002)
Period		
- late communism (1987)	ref	ref
- early transformation (1992)	-1.414 (1.230)	0.485*** (0.047)
- mature transformation (1999)	-0.214 (1.294)	1.527*** (0.065)
- consolidated transformation (2009)	-4.015*** (1.424)	2.240*** (0.075)
Father's ISEI * period		
- late communism (1987)	ref	ref
- early transformation (1992)	-0.032 (0.045)	0.003* (0.001)
- mature transformation (1999)	-0.002 (0.039)	0.003 (0.002)
- consolidated transformation (2009)	0.044 (0.043)	0.006*** (0.002)
Vocational training * period		
- late communism (1987)	ref	ref
- early transformation (1992)	0.214 (1.097)	0.032 (0.044)
- mature transformation (1999)	-0.319 (1.086)	0.130** (0.054)
- consolidated transformation (2009)	-0.174 (1.189)	0.129** (0.065)
High secondary education * period		
- late communism (1987)	ref	ref
- early transformation (1992)	0.400 (1.401)	0.074 (0.050)
- mature transformation (1999)	-0.940 (1.341)	0.163*** (0.061)
- consolidated transformation (2009)	-1.641 (1.411)	0.187*** (0.071)
Tertiary education * period		
- late communism (1987)	ref	ref
- early transformation (1992)	0.816 (2.320)	0.246*** (0.075)
- mature transformation (1999)	-2.531 (1.935)	0.348*** (0.088)
- consolidated transformation (2009)	-1.769 (2.078)	0.253*** (0.087)

Age	-0.024 (0.093)	0.042*** (0.005)
Age squared	0.001 (0.001)	-0.000*** (0.000)
Male	-2.061*** (0.351)	0.359*** (0.016)
Constant	26.164*** (2.165)	7.613*** (0.122)
Type of settlement dummies	Yes	Yes
County dummies	No	No
Observations	4,281	3,705
R-squared	0.490	0.843
F-stat	132.7	641.1
p-value	0.00	0.00

Source : ISSP Integrated Hungarian data files: 1987, 1992, 1999, 2009

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

With respect to wage returns, estimates in Model 5 display significant interaction terms between education and period. Data reveal an increase in the impact of education on earnings. Vocational training and high school education seem to begin providing wage premium from a later stage of post-communist transformation (estimates are significantly positive in 1999 and 2009 but not in 1992). Tertiary education, however, increases earnings already even in the early transformation period in contrast to the communist times revealing how market transition and the emerging private sector favored the graduated labor force immediately after the collapse of communism. This pattern is the same for respondents aged 28-45, as well. Lower age selection makes a difference only for the reversed U-shaped age effect; it is more marked for the selection of younger respondents. The opposite gender effects are present in Model 5, too, when all predictor variables are added to the equation. When fitting Model 5 to the data of men and women separately, the interaction terms disclose stronger increase in wage returns to education over time for men than women.

### Summary and discussion

Hungary is one of the post-communist countries for which a rich literature exists with lots of empirical findings on the broad topic of intergenerational social mobility: status attainment, educational inequalities, school-to-work transition, returns to educational investments. In this analysis, we investigated four research questions on returns to education for the Hungarian case. Conceptually, the study is based on a wide framework where returns to education can go beyond earnings as analyzed in terms of wage equations (Becker 1975. Mincer 1974). Several other sociological features can be outcome variables related to human capital investments including occupation, health, demographic behavior and events, happiness. The broadest concept on the impact of education goes even beyond these individual ‘goods’ and regards educational outcomes as ‘public good’ affecting the wellbeing of whole communities (Topel 1999). This paper does not go so far; our four research questions are analyzed for two dependent variables, the occupation (ISEI) and the earnings of the respondent. We were particularly interested in the changes in the effect of our predictor variables over time.

For the *first* research question on the direct effect of social origin, *the Hungarian case shows a persistent influence of social background on occupation status*. The estimate is significant even in the last, most complex model with all of the predictors and interactions. This is different when earnings are predicted. *The direct effect of social origin on earnings is significant even if it is controlled for education but vanishes when period dummies and the interaction terms on changes over time are also included in the model*.

Regarding the *second* research question on the variation of the impact of social background by levels of schooling achieved, *we found stronger influence of father’s ISEI on respondent’s ISEI for those with primary and tertiary level of schooling as compared to those*

*with secondary level of schooling.* On the one hand, social background compensates for the missing educational returns in the case of uneducated but, on the other hand, tertiary educated also benefit more from their advantageous social background than secondary educated. There seems to be no such variation in the effect of social origin by levels of education when earnings are predicted unless we control for negative selection for being unable to find a job and analyze only those respondents who are in the labor force. In that case *we find the compensation effect of social background for the missing wage returns in case of the poorly educated, too.*<sup>7</sup>

The *third* research question refers to variation of the effect of social background over time. In this regard, *there seems to be no difference in Hungary for social status, while the impact of social origin on earnings seems to increase over time under the post-communist times.* In this model, the direct effect of father's ISEI turns to insignificant. Finally, the analysis of the *fourth* research question reveals *no significant change in the effect of education on respondent's occupation over time.* There is, however, a *significant increase in the wage returns to education over time* after the collapse of communism in Hungary.

In the light of the previous studies, our findings confirm the rising wage returns to education in Hungary, found by Kertesi and Köllő (2002, 2005), Róbert (2009), Kolosi and Keller (2012). The *new result* of this analysis is the growing impact of social origin on earnings over time. Interestingly, we were unable to find the decline in status returns over time expected to be a consequence of educational expansion. This finding was present in the analysis by Róbert (2009) but his models did not control for social origin. This pattern was detected in the TARKI-Monitor data, also without information on family background. It seems that the decrease in status returns of education, i.e. respondents with the same level of schooling end up in jobs with lower ISEI score, is present in Hungary but the trend can be proven only if the analysis does not control for the (probably growing) intergenerational occupational reproduction in social status.

An important limitation of our analysis is that we predicted current occupation and earnings and our results are, consequently, affected by the ageing effect. However, re-estimating the models both for the age group of 28-65 and of 28-45 did not show much difference. We controlled for age (linear and quadratic terms) and found interesting patterns. For occupation, ISEI score increases by age though this effect levels off as respondents are getting older. This means that seniority contributes to status attainment in Hungary. For wage returns, the pattern is the opposite, younger respondents have higher salaries in contrast to the older ones. However, this pattern modifies when we control for the period effects, the changes over time. Apparently, the fact that salaries are not affected by seniority but younger (and on average better educated) respondents can earn more than their older (and on average less educated) counterparts is a phenomenon connected to the post-communist market transformation. Consequently, the pattern disappears when we control for the period effects in the data.

Finally, there is characteristic gender difference in Hungary: women have higher job status but, despite of this, men have higher earnings. Moreover, the observed increase of wage returns to education over time is more characteristic for men than women.

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<sup>7</sup> To some extent, analyzing only those who are in the labor force may be the correct solution, particularly when investigating wage returns, even if we have a selection effect in the models.

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