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The Consequences of Cumulative Discrimination: How Special Schooling Influences Employment and Wages of Roma in the Czech Republic

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and Wages of Roma in the Czech Republic**

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October 2013

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ABSTRACT

The Consequences of Cumulative Discrimination: How Special Schooling Influences Employment and Wages of Roma in the Czech Republic

Unequal labour market outcomes between Roma and non-Roma have typically been explained by either the low level of educational attainment on the one hand or labour market discrimination on the other – or both. A number of studies have found that significant labour market inequalities persist even after the low levels of educational attainment amongst Roma have been accounted for. Here we look at the role of special schooling in driving labour market inequalities between Roma and non-Roma in the Czech Republic. We confirm the findings of other studies that Roma face significant differences in labour market outcomes which cannot be explained in terms of educational attainment. Moreover, we find that the segregation of Roma into special remedial schools for the mentally disabled influences both labour market outcomes and the level of educational attainment; the latter effect being particularly strong. Special school attendance explains a small part of Roma labour market discrimination as typically measured, but its main impact is through lowering Roma educational attainment suggesting an additional discriminatory element in Roma/non-Roma labour market outcomes which is more typically ascribed to ‘justified’ Roma/non-Roma educational differences. Thus, we propose that labour market inequality should not only be understood as result of low attainment and labour market discrimination per se but as a complex outcome of cumulative discrimination. In contrast to previous papers which take a parametric approach assuming common support between Roma and non-Roma, the non-parametric matching approach employed here explicitly takes into consideration the substantial differences in educational attainment observable between Roma and non-Roma.

JEL Classification: J15, I24

Keywords: Roma, labour market discrimination, Central Europe

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1. Introduction

The Roma are both the largest ‘minority’ ethnic group in Central and South Eastern Europe and the one that suffered most from transition to the market economy. Opinions differ as to the causes of these difficulties but the fact remains that still today, nearly forty years after the introduction of the EU’s 1975 Discrimination Directive and with the end of the ‘Roma Decade’ (2005-15) in sight, people from the Roma minority have unemployment rates far above – and employment rates and wages far below – those of majority populations throughout the region (O’Higgins 2012).

Unequal labour market outcomes between Roma and non-Roma have typically been explained by either the low level of educational attainment on the one hand or labour market discrimination on the other. Such explanations tend to be polarising in that, lower educational attainment tends to be attributed to Roma’s unwillingness to participate in education whereas unexplained differences in employment and wages – once educational attainment is controlled for, are attributed to discrimination on the part of the employers. A number of studies have found that significant labour market inequalities persist even after the low levels of educational attainment amongst Roma have been accounted for. The residual inequalities are then attributed to labour market discrimination based on the assumption that in the absence of discrimination Roma and non-Roma with the same level of education should achieve the same labour market outcomes. We argue here however, that this is a too simple picture. On the one hand, differences in labour market outcomes between Roma and non-Roma which are not explained by broad measures of educational attainment may reflect issues such as the quality of education and/or the fields of study; on the other, low levels of educational attainment may in themselves reflect discriminatory practices operating in the scholastic system. The importance of the issue is that, in both cases, the solution lies in modifying educational arrangements rather than combating labour market discrimination per se. Here the emphasis is on the role of segregation in the educational system. Specifically, we focus on the role that participation in special schooling has in determining differences in Roma/non-Roma labour market outcomes both through its direct negative influence on participants’ wages and employment prospects and also its indirect negative impact on educational attainment (and consequently employment and wages).

Section 2 discusses the education/discrimination dichotomy in more detail; section 3 describes the system of special schooling in the Czech Republic; section 4 describes the methodology employed in the analysis and section 5 describes the results. Finally, section 6 offers some concluding remarks. The key findings are that a) special schooling influences the employment and wages of Roma both directly and indirectly, however, it is the latter indirect channel which is the more influential in affecting Roma/non-Roma labour market inequalities.

2. Roma, the labour market and special schooling

Low levels of educational attainment and labour market discrimination have been identified as central predictors of labour market inequality between Roma and non-Roma in Central and Southeast Europe. After accounting for low levels of educational attainment amongst Roma, several studies found persisting labour market inequalities between Roma and non-Roma that are attributed to discrimination. Applying Blinder–Oaxaca decomposition analysis to household surveys, several studies found labour market discrimination against Roma in Bulgaria, Romania and Hungary (Revenga et al. 2002), Bulgaria, Kosovo and Serbia (Milcher 2011), Albania and Kosovo (Milcher & Fischer 2011). Applying logistic regression to census data, Kosko (2012) found a “stunningly high level of unexplained difference in employment outcomes” (ibid, p. 437) showing that Romanian Roma with the same level of education attained were more frequently unemployed and in unskilled, low wage employment. Applying Blinder–Oaxaca type decompositions (and their non-linear counterparts) to a recursive ‘structural’ model, O’Higgins (2010) has shown that for Roma in South-East Europe as a whole, employment and wages are less sensitive in absolute terms to educational participation resulting in a wage gain for an additional year of schooling of a little over one-third compared to the wage gain of non-Roma populations. This result also suggests that the lower returns to education for Roma – that is, the smaller benefits accruing to more educated Roma in terms of increased chances of finding work and higher wages - arising from unobserved differences attributed to discrimination, in themselves go some way towards explaining the lower educational participation of this ethnic group.

The studies mentioned above are the first ever attempts that use multivariate regressions to identify the effects of labour market discrimination on the labour market outcomes of Roma. Unfortunately, studies have not accounted for two aspects that might significantly influence labour market outcomes of Roma: student performance and school quality. Roma may possess less work-relevant abilities than non-Roma do. Performance gaps of Roma compared to non-Roma have been found in Hungary (Kertesi and Kézdi 2011), Serbia (Baucal 2006) and Slovakia (Brüggemann & Bloem 2013). It is possible that Roma with the same level of education and the same number of years spend in school tend to have lower wages and higher unemployment because they do not enter the labour market with the same skills and abilities as non-Roma do. Furthermore, Roma may have received education of worse than average quality compared to the education that non-Roma have received. Looking at schools with a majority Roma student body in Romania, Surdu (2003) for example found overcrowded classes and a shortage of qualified teachers. Especially ethnically segregated Roma schools that exist in all Central and Southeast European countries are known for bad infrastructure and low quality teaching (Rostas 2012). It is reasonable to assume, that attending a low quality school reduces labour market prospects of Roma, as employers see would prefer hire individuals who attended better schools.

The approach adopted here attempts to use special school experience as proxy indicator for student performance and school quality. Students attending special remedial schools for

children with mental disabilities¹ are subject to heavily reduced curricula and are likely to emerge with fewer marketable skills that will reduce their employment outcomes. Moreover, special school attainment not only causes but also signals low quality education and therefore employers are likely to prefer graduates from regular schools even if skills are similar.

Additionally, it is likely that special schooling not only influences labour market outcomes directly through student performance and school quality but also indirectly through its influence on education attainment. Special schooling strongly limits the possibilities to proceed beyond lower secondary education (Friedman et al. 2009). Thus, we hypothesize that special schooling accounts for: a) a part of the gaps in labour market outcomes that are typically attributed to labour market discrimination; and, b) a part of the gap in labour market outcomes that is due to unequal educational attainment. We thus suggest that unequal labour market outcomes of Roma are due, at least in part, to cumulative discrimination (Blank 2005): directly through labour market discrimination between those with the same levels of education and indirectly through discrimination in education that leads to unequal educational attainment and hence unequal labour market outcomes.

¹ Special remedial schools for children with mental disability have been labelled practical schools since 2005. However, the age group that we look at (25-64) finished their special education experience before 2005.

3. Special schooling and discrimination of Roma in the Czech Republic

The basis of today's special school system in the Czech Republic was institutionalised during the first Czechoslovak Republic with the adoption of Act No. 86/1929 of the Law Code on auxiliary schools (EACEA 2010a, p. 266). Since, special education in Czechoslovakia witnessed a "phenomenal" growth in terms of absolute numbers as well as total share of students enrolled in special schools (Černá 1994, p. 274). Today the Czech Republic ranges among the countries with the highest special education rates in Europe; 8.6% of the student body is classified to have special needs, 4.4% is being segregated in special schools or classes (EADSNE 2010, p. 15).

Several studies show that Roma are disproportionately streamed into special remedial schools for children with mental disability (*zvláštní škola*). A widely quoted government document published in 2003 suggested that 75% of all Roma children visited remedial special schools (Government of the Czech Republic, 2003, p. 11). The European Roma Rights Center (ERRC 2004, 23) found a strong overrepresentation of Roma in the Czech cities of Ostrava (1999) as well as Kladno, Teplice and Sokolov (2002); where Roma comprised more than 50% of the student body in remedial special schools. According to the ERRC the strong overrepresentation of Roma in Czech special schools is a result of a set of discriminatory practices including biased teacher attitudes, abuse of parental consent, racially-biased testing and abuse of testing procedures among others (*ibid.*, p. 34). In 2007 the Grand Chamber of the European Court of Human Rights (ECHR) decided on the basis of above-mentioned statistics (Roma from Ostrava were 27 times more likely to receive special schooling compared to non-Roma) that Czech Roma applicants were victims of indirect discrimination (O'Nions 2010, p. 12).

The Czech Schools Act of 2005 replaced the category "special remedial school" with "practical primary school" (*základní škola praktická*) while the curriculum of these schools remained substandard and designed for mentally disabled pupils (EACEA 2010b, p. 311). An ERRC (2009, p.4) study found continuous overrepresentation of Roma in "practical primary schools" with a lack of informed choice of Romani parents, the fear of parents to experience racism in mainstream schools, biased testing procedures and financial incentive structures that disadvantage poor families being among the triggers of Romani overrepresentation. Moreover, it was found that considerable share of teachers at "practical primary schools" did not have sufficient formal qualifications (*ibid.* p. 21) and that the only option to continue education after lower secondary attainment was to enrol in vocational training with extremely limited success prospects (*ibid.* p. 37). Unemployment rates of graduates of practical schools are far above average (EACEA 2010b, p. 156). 2011 household survey data shows that 17% of surveyed Roma students aged 7 to 15 attended special schools, while it is likely that this share is underestimated due to the relabeling mentioned above (Brüggemann 2012, p.67). Moreover, it was indicated for 60% of Roma students aged 7 to 15 who attended special schools that the majority of schoolmates were Roma (*ibid.*, p. 70).

4. Data and method

4.1 *The Regional Roma survey 2011*

Data for this analysis comes from the UNDP / World Bank / European Commission regional Roma survey 2011. The survey has been conducted in Roma households and non-Roma households in close proximity to Roma households in twelve countries of Central and Southeast Europe. The sample contains around 750 Roma and 350 non-Roma households in each country and represents the up to date largest dataset on Roma households. The survey is not representative for all Roma and non-Roma in the respective countries but for Roma and their direct neighbours that live in areas with average and above average shares of Roma as indicated by census data. To identify Roma households a three stage random representative sampling was used. A team of two interviewers conducted face to face interviews. Information about the household characteristics and household members was provided by the head of a household or the person that proved to be most knowledgeable. Attitudes and individual status questions were answered by a respondent over 15 years of age randomly selected through the first birthday technique (see Ivanov, Kagin & Kling 2012 for details).

4.2 *Sample characteristics*

Table 1 illustrates the sample sizes of the regional Roma survey in the Czech Republic disaggregated by ethnicity and gender. The overall sample for comprises information about 6864 Roma (2942 aged between 25 and 64) and 2246 non-Roma (1179 aged between 25 and 64).

Table 2 illustrates the principal sample characteristics with regard to age, educational participation and labour market outcomes. In comparison to non-Roma living in close proximity, Roma are strongly disadvantaged in terms of educational participation as well as employment outcomes. On average Roma spend around three years less in school than non-Roma. Around one third of Roma completed at least upper secondary education compared to 90% or more of the non-Roma sample. Moreover, nearly 20% of Roma in the Czech Republic attended special schools whereas the share of non-Roma with special school experience is barely above zero. Similarly in the labour market, Roma have low employment rates and wages: less than 43% (20%) of adult male (female) Roma are employed. On average, Roma also earn significantly less than non-Roma; roughly two thirds of their gender specific non-Roma counterparts. Potential work experience (defined as age of respondent subtracted by age when leaving school) is broadly similar reflecting that Roma are on average younger than non-Roma but also leave school earlier. The data furthermore reveals gender gaps in educational attainment, unemployment and wages showing strong disadvantages of females compared to males in both Roma and non-Roma samples. Gender differences are especially pronounced regarding labour market outcomes. Both Roma and non-Roma living in close proximity to Roma households tend to live in disadvantaged areas. Compared to national averages, both samples tend to show considerably lower educational attainment and employment rates.

Table 1: UNDP/WB/EC Regional Roma survey 2011, the Czech Republic, sample size by ethnicity and gender

	Roma		Non-Roma living in close proximity	
	Male	Female	Male	Female
Total	1646	1707	520	529
aged 25-64	705	752	247	292

Source: UNDP / World Bank / EC regional Roma survey 2011.

Table 2: Principal characteristics of the sample, by ethnicity and gender, age 25-64

Years of schooling	Roma	Males	9.9 (2.10)
		Females	9.7 (1.87)
	Non-Roma	Males	12.6 (2.10)
		Females	12.2 (1.90)
Age	Roma	Males	40.6 (10.32)
		Females	39.5 (10.59)
	Non-Roma	Males	41.1 (10.99)
		Females	40.6 (11.05)
<i>Educational attainment (%):</i>			
No Formal education	Roma	Males	5.0
		Females	4.3
	Non-Roma	Males	0.4
		Females	0.4
primary education	Roma	Males	11.0
		Females	11.8
	Non-Roma	Males	0.4
		Females	0.0
lower secondary education	Roma	Males	50.4
		Females	57.1
	Non-Roma	Males	9.3
		Females	12.7
upper secondary education	Roma	Males	33.6
		Females	26.7
	Non-Roma	Males	78.8
		Females	78.5
post-secondary education	Roma	Males	0.0
		Females	0.0
	Non-Roma	Males	11.2
		Females	8.5
Attended a special school	Roma	Males	19.5
		Females	18.5
	Non-Roma	Males	0.4
		Females	1.4
<i>Labour market:</i>			
Employment rate	Roma	Males	42.8
		Females	19.4
	Non-Roma	Males	75.9
		Females	63.7
Median Monthly Wages (€/month, ppp)	Roma	Males	803
		Females	535
	Non-Roma	Males	1204
		Females	803

Source: UNDP / World Bank / EC regional Roma survey 2011.

4.3 Method

We first estimate the returns to education of Roma and non-Roma using a standard Mincerian model. This involves estimating the probability of employment using a probit model and wages using ordinary least squares (OLS); in both cases the outcome variable is expressed as a function of a small number of explanatory variables specifically controls for educational attainment and (potential) experience². This throws some light on the Roma labour market disadvantage taking into account differences in educational attainment and experience. The main purpose here is to get an initial idea of the role of special schooling. To this end, two specifications are estimated; that is, without and with a dummy variable to control for whether the individual attended a special school.³

In principle, one may use this type of parametric estimation technique as a basis for drawing inferences about labour market discrimination. However, this type of framework is based on some questionable assumptions. First, it assumes that education attainment is exogenous to employment and wages, yet one would expect people to choose their participation at least in part, on the basis of its expected usefulness in finding employment and/or in raising wages. Second, and the issue which is of central concern here, the methodology assumes the existence of common support or, to be more precise, assumes that the estimates of returns are valid outside the field of common support. In other words, the approach assumes that Roma and non-Roma are similar across the observed characteristics used to derive estimates of returns to education. Given the huge disparity in educational levels between Roma and non-Roma noted above, this is clearly not the case here. As was noted above, despite improvements in educational participation, Roma are still heavily concentrated in the lower ends of the educational attainment scale, whilst, non-Roma on average have much higher levels of attainment and are almost absent from the lowest 'no education' level.

Therefore, in a second step we apply a non-parametric (person-to-person) matching technique in order to estimate the explained and unexplained differences in employment and wages. This approach explicitly bases the estimates of explained and unexplained components on observed differences in outcomes for which there is common support⁴ (Nopo 2008). More precisely, the approach involves one-to-many 'perfect' matching. An individual is taken from the Roma sample and then that person's outcome - in terms of employment or wages - is compared to the average (i.e. the mean) of all those in the non-Roma sample with the same characteristics. The process is repeated (with replacement in the non-Roma sample) until all the Roma sample have been considered. At the end some Roma may not have found matches, as indeed some non-Roma may not have been included in the comparisons due to their lack of shared characteristics; these two groups are outside the common support and any differences

² Potential experience is simply the current age minus the years of schooling minus six (the age at which compulsory schooling begins). Thus, it represents time since leaving school and is typically included in this type of estimation framework.

³ Since the purpose is purely illustrative, in contrast to the slightly more sophisticated recursive model of O'Higgins (2010), no attempt is made to control for endogeneity and/or sample selection bias.

⁴ It is precisely this characteristic which makes the methodology useful here. One may observe that also other potential matching approaches – such as propensity score matching which is otherwise an obvious alternative candidate for use in this type of exercise, is also extremely susceptible to the failure of common support since persons with similar propensity scores may have - and in this case almost certainly will have - quite different (educational) characteristics.

in Roma and non-Roma wages and employment outcomes are considered to be explained by their differential characteristics.

The ‘unexplained’ portion of the differential is thus based explicitly on persons with the same characteristics (other than ethnicity), making no assumptions about effects outside the field of observation; the estimate of labour market discrimination thus obtained is based on the notion that those with the same characteristics (apart from ethnicity) should have the same employment and wage prospects. The method also allows a simple examination of unexplained differences across individual characteristics which allow some analysis of the factors driving discrimination. The major drawback with the method is the so-called ‘curse of dimensionality’. In common with other non-parametric and semi-parametric approaches, as the number of characteristics forming the basis of the ‘common support’ is increased the number of matches is correspondingly reduced – reducing the field of common support. This essentially means that, the number of base characteristics – or controls – must be relatively limited. In practical terms, the same basic characteristics were included as in the parametric estimations reported above, with controls for education, (potential) experience and separately for special schooling.

A central notion underlying our paper is that discrimination in the form of segregation of Roma into special schools affects labour market outcomes in two ways: a) directly by lowering the quality of education and hence the level of skill of individuals at any given level of education; and, b) indirectly, by impeding further advancement through the education system. The last part of our analysis thus considers also the indirect effects of special schooling on Roma/non-Roma differentials in labour market outcomes by estimating an ordinal probit model of educational attainment in order to assess the extent to which special schooling limits affects the wages and employment of Roma indirectly through its effects on educational attainment. Again, two specifications, without and with a dummy variable to control for whether the individual attended a special school respectively, are estimated.

5. Analysis

The estimation of simple Mincerian returns to education equations allows a first look at the effects of ethnicity on employment and wage outcomes (Tables 3 and 4). Table 3 reports the estimated effects of ethnicity and sex on the probability of employment and the wages of the employed controlling for differences in education and (potential) experience. The second column reports the estimates of the employment probability including also a dummy to indicate whether the person attended a special school. It might be recalled that almost no non-Roma follow this path. This approach makes the quite strong assumption that *inter alia* the relative returns to education⁵ are the same across ethnicity and sex, an issue which will be returned to below.

Table 3: Estimation of employment probability

	No special schooling		With special schooling	
	Coefficient	standard error	Coefficient	standard error
Roma	-0.50	0.12	-0.48	0.12
Female	-0.49	0.13	-0.49	0.13
Female & Roma	-0.31	0.15	-0.32	0.15
Special school	-	-	-0.30	0.11
Primary education	-0.09	0.23	-0.01	0.23
Lower secondary	0.03	0.20	0.00	0.20
Upper secondary	1.03	0.20	0.97	0.21
Post-secondary	1.70	0.36	1.65	0.36
Potential experience /10	.71	0.10	.74	0.23
(Potential experience)²/100	-0.17	0.01	-0.17	0.01
Intercept	-0.37	0.28	-0.34	0.28
Pseudo R²	0.277		0.279	
N	1974		1974	

Source: estimated on the basis of the UNDP/WB/EC regional Roma survey 2011.

Notes: 1) statistical significance is indicated as follows – *italic type* indicates $p < 0.10$; **bold type** indicates $p < 0.05$, **bold and italic type** indicates $p < 0.01$.

2) Models are estimated for the adult 25-64 population.

The results suggest that Roma face significant obstacles in obtaining employment even if low educational attainment is controlled for. It may also be observed that the statistically significant coefficient on ‘Roma & Female’ implies that Roma females face additional advantages as compared to non-Roma females in regard to their chances of finding employment. Special schools seem to play a substantial (and statistically significant) role in determining poorer employment chances. Curiously, Roma disadvantage – in terms of employment opportunities – is not much altered by controlling for special schools – this

⁵ For the wage equation, the parameters on educational level may be interpreted as the percentage increase in monthly wages accruing to those with a specific characteristic compared to those without that characteristic i.e. the default category. For the employment probability equation, the coefficient values do not have this simple interpretation. In this case the coefficients indicate the direction of change of specific factors, but some care is needed in interpreting the interaction term and above all its standard error.

implies that special schools do not account for much of the observed labour market disadvantage of Roma – given the level of educational attainment.

Turning to wages, table 4 reports the results of estimating a simple – and standard - Ordinary Least Squares regression of determinants of the (natural logarithm of) monthly wages. The specific form allows us to interpret the coefficient as the percentage difference in monthly wages between possessing specific characteristics and those who do not.

Table 4: OLS estimation of wage returns to education

	No special schooling		With special schooling	
	Coefficient	standard error	Coefficient	standard error
Roma	-0.36	0.06	-0.35	0.06
Female	-0.48	0.06	-0.48	0.06
Female & Roma	<i>0.14</i>	0.08	<i>0.14</i>	0.08
Special school	-	-	-0.13	0.08
Primary education	-0.13	0.20	-0.13	0.20
Lower secondary	0.07	0.18	0.04	0.18
Upper secondary	0.29	0.18	0.24	0.18
Post-secondary	0.85	0.20	0.81	0.20
Potential experience /100	2.34	0.95	2.45	0.95
(Potential experience)2/100	-0.04	0.02	-0.04	0.02
Intercept	6.49	0.21	6.52	0.21
R²	0.269		0.271	
n	811		811	

Source: estimated on the basis of the UNDP/WB/EC regional Roma survey 2011.

Notes: 1) statistical significance is indicated as follows – *italic type* indicates $p < 0.10$; **bold type** indicates $p < 0.05$, **bold and italic type** indicates $p < 0.01$.

2) Models are estimated for the adult 25-64 population.

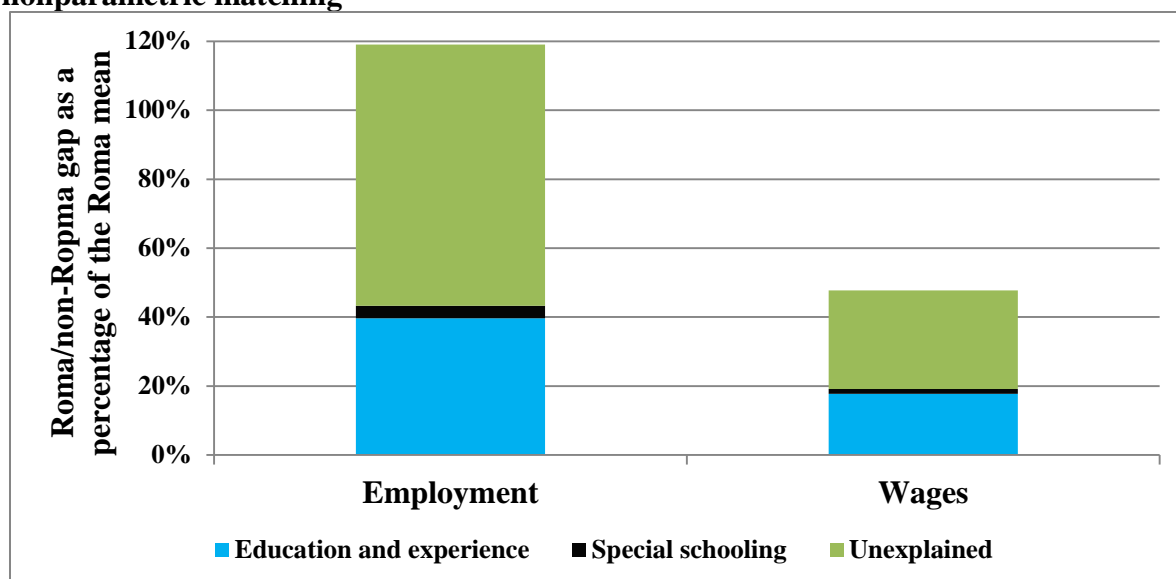
The results of the wage regression suggest that: Roma face a substantial wage penalty even controlling for educational attainment and special school experience. The interaction effects of female & Roma are only weakly statistically significant so that one may conclude that Roma women face (more or less) the same wage penalties as Roma men. The coefficient on special schools is not statistically significant.

The results of applying the Ñopo non-parametric matching procedure for employment and wages are shown graphically in figure 1 (with more detailed numerical results being reported in table 5). The height of the bar for each country represents a comparable measure of the size of the gap in each case, and the red part of the bar represents the size of the unexplained part of the gap⁶. The three ‘explained’ components of the employment and wage differences are

⁶ In practice the figure reports the results of two separate matching procedures, with and without controls for special schooling, the fuller results are reported in table 5.

added together for visual comparison, whilst the additional reduction in the ‘unexplained’ portion due to special schooling is shown separately.

Figure 1: Estimation of unexplained differences in employment and wages using nonparametric matching



Source: estimated on the basis of the UNDP/WB/EC regional Roma survey 2011.

Notes: 1) the figure reports the results of estimating the portions of the Roma/non-Roma employment and wage gaps accounted for by education, experience and, separately, special schooling as well as the unexplained component using the non-parametric matching technique proposed by Nopo (2008).
2) the height of each bar is the Roma/non-Roma gap (in employment or wages) expressed as a percentage of the Roma mean value.
3) In each case, the estimated unexplained gaps are statistically significant at 1%.

Table 5: Detailed results from the estimation of unexplained differences in employment using nonparametric matching

	Employment		Monthly wages	
	No special schooling	With special schooling	No special schooling	With special schooling
Expressed as a proportion of the Roma mean				
Total	1.190	1.190	0.478	0.478
Unexplained	0.793	0.757	0.300	0.286
Expressed as a % of the Roma/non-Roma gap				
‘Unexplained’	66.66%	63.64%	62.87%	59.84%
‘effect’ of special schooling in % point term	3.0		3.0	

Source: estimated on the basis of the UNDP/WB/EC regional Roma survey 2011.

Note: In each case, the estimated unexplained gaps are statistically significant at 1%.

The figure illustrates that there is clear evidence of labour market discrimination for both employment and wages. A substantial portion – two-thirds – of the Roma/non-Roma gap in

employment remains unexplained after controlling for education and experience. For wages, the portion of the gap that remains after controlling for education and experience is slightly smaller than for employment but still considerable (around 63%). The inclusion of special schooling as a control, reduces the ‘unexplained differences’ in employment and wages – that is to say, discrimination - by a little, around 3 percentage points for both wages and employment.

Finally we look at the indirect effect of special schooling which may arise if special schooling directly affects educational attainment (and hence indirectly employment and wages). Table 6 reports the results of estimating an ordinal probit model of educational attainment. Dummy variables representing age-groups are introduced in order to control for changes in the schooling system over recent years and, as before, two versions for each country are reported with and without a dummy for special schooling. One may observe that, of primary interest here, the coefficient on special schooling is large and statistically significant. One may observe also that the introduction of the control for special schooling reduces the size of the negative Roma coefficient. The results thus demonstrate that, not very surprisingly, attending a special school has a strong negative effect on the level of educational attainment.

Comparing this with the results reported above of the small role special school attendance plays in reducing the unexplained portions of employment probabilities and wages, we may conclude that the main channel through which (special) school segregation of the Roma is affecting their labour market outcomes is through its effect on Roma educational attainment.

If one accepts that school segregation is a *de facto* discriminatory practice, then this implies that a significant part of the ‘explained’ differences in labour market outcomes which are due to differences in between Roma and non-Roma in educational attainment may in fact be attributed to discrimination, albeit not to labour market discrimination *per se*. In any event, these results provide strong quantitative evidence to support the notion that that one major cause of Roma labour market disadvantage is to be sought in the *de facto* segregation of Roma into special schools; a major cause of cumulative discrimination.

Table 6: Ordinal probit model of educational attainment

	No special schooling		With special schooling	
	Coefficient	standard error	Coefficient	standard error
Roma	<i>-1.79</i>	0.08	<i>-1.68</i>	0.08
Female	<i>-0.13</i>	0.05	<i>-0.14</i>	0.05
Special school	-	-	<i>-0.88</i>	0.08
age 30-34	0.08	0.09	0.06	0.09
age 35-39	0.05	0.09	0.06	0.09
age 40-44	0.00	0.10	0.05	0.10
age 45-49	<i>-0.20</i>	0.11	<i>-0.21</i>	0.11
age 50-54	<i>-0.31</i>	0.11	<i>-0.34</i>	0.11
age 55-59	<i>-0.53</i>	0.11	<i>-0.50</i>	0.11
age 60-64	<i>-0.59</i>	0.12	<i>-0.59</i>	0.12
Cut-off 1	<i>-3.64</i>	0.11	<i>-3.80</i>	0.12
Cut-off 2	<i>-2.96</i>	0.11	<i>-3.09</i>	0.11
Cut-off 3	<i>-1.41</i>	0.10	<i>-1.43</i>	0.10
Cut-off 4	<i>1.16</i>	0.10	<i>1.16</i>	0.10
pseudo R²	0.166		0.195	
N	1990		1990	

Source: estimated on the basis of the UNDP/WB/EC regional Roma survey 2011.

Notes: 1) statistical significance is indicated as follows – *italic type* indicates $p < 0.10$; **bold type** indicates $p < 0.05$, **bold and italic type** indicates $p < 0.01$.

2) Models are estimated for the adult 25-64 population.

6. Conclusion

This paper builds on a relatively small body of quantitative work about labour market inequalities of Roma, based on adequate survey instruments, and contributes to the ongoing debate on the role of education in determining economic outcomes for Roma.

In common with other studies, we find that a considerable part of Roma/non-Roma employment and wage gaps are explained by low levels of education. This first finding confirms the importance of educational attainment for labour market outcomes of Roma. However, a considerable share of observed differences cannot be explained by educational attainment alone. This second finding supports the notion that labour market discrimination plays a role in reducing the employment prospects of Roma. Recognising the strong overrepresentation of Roma in special schools we find a small but significant negative effect of special schooling on labour market outcomes. This third finding suggest that overrepresentation in special schools lowers employment and wage perspectives and the remaining unexplained gap labour market outcomes supports the thesis of severe labour market discrimination against Roma.

Finally, although the effect of special school attendance has only a small direct influence on labour market outcomes, we also find that special school attendance strongly influences the educational attainment of Roma: only a few special school graduates attain upper secondary education or higher. This suggests that the main channel through which special schools affect Roma labour market is indirect arising from the influence that attending such schools has on educational attainment and hence on labour market inequalities. This finding strongly suggests that action to remedy the ethnicity based labour market inequalities would do well to address the important source of cumulative discrimination that arises through the de facto segregation of Roma into schools for children with mental disabilities.

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