

# *Evidence of Returns to Education Among Roma in Central and Eastern Europe and Their Policy Implications*

Susanne Milcher  
Katarína Zigová

In this paper we analyze specific educational issues faced by Roma households using data from the UNDP/ILO survey conducted in Bulgaria, the Czech Republic, Hungary, Romania and Slovakia in 2001. Roma situation is characterized by poverty, low educational achievements, and consequently limited employment opportunities. We believe that the core of this trap is insufficient education, non-preparedness for entry into the labor market of a market economy. This is demonstrated by the existence of vital returns to education estimated for Roma households throughout the region. The patterns are similar over the whole region and hence the need for a systematic and common education policy of Roma is both necessary and beneficial.

*Key Words:* returns to education, Roma minority, poverty,  
labour market

*JEL Classification:* J15, J24, J31

## **Introduction**

In 2001, the United Nations Development Programme (UNDP) conducted a large survey on Roma households in five Central and Eastern European countries, which revealed a critical socio-economic status of this ethnicity. Roma live predominantly in disadvantaged areas isolated from the majority population, facing poor housing standards and health care. Due to their segregation in settlements, Roma find it harder to attend and complete education comparable with that of the majority. Consequently, they encounter constraints on the labor market. As a result of these problems and specificities, the Roma minority belongs

*Susanne Milcher is a Specialist in Poverty and Economic Development of the United Nations Development Programme, Regional Centre Bratislava, Slovakia.*

*Katarína Zigová is a Consultant at the Strategic Research and Economy Branch of the United Nations Industrial Development Organization, Vienna, Austria.*

*Managing Global Transitions* 3 (1): 51–69

throughout Europe to the poorest ethnic group. They suffered disproportionately from restructuring and more than ten years later, they are worse off in terms of nearly all basic social welfare indicators.

The crucial issue of our paper is returns to education. Some empirical results from Central and Eastern European countries (Jones and Ilayperuma 1994 for Bulgaria; Halpern and Kőrösi 1997 for Hungary; Chase 1997; Flanagan 1995 for the Czech Republic and Slovakia) suggest that the returns to education increased for higher educated individuals in comparison with the socialism period. As conventionally assumed, results indicate that returns to education increased during transition, since contributions by skilled individuals were devalued in the communist system. On the other hand, some skills learned under socialism are no longer applicable in modern market economies, therefore returns to experience obtained under communism are found to decrease during transition (Filer, Jurajda and Plánovský 1999). Several attempts to establish global patterns have been made during the last 40 years (Psacharopoulos 1973; 1985; 1994; Psacharopoulos and Patrinos 2002). The latest update of the classic pattern of falling returns to education by level of economic development and level of education estimates a 10% average rate of return to another year of schooling for 42 countries. However, returns to education for Roma tend to show different patterns because they are rarely high educated, and most of their skills attained during socialism are not marketable any more (World Bank 2001). Secondly, the majority of Roma live in less developed areas, where unemployment is more pronounced and dependency on social contributions or irregular jobs is present. This therefore causes disincentives to invest into education of their children and creates a continuous circle of a weakly educated labor force.

In this paper, we analyze regional and ethnic disparities in five most Roma populated countries of Europe, where three of them are members of the enlarged Europe. In Bulgaria, the Czech Republic, Hungary, Romania and Slovakia there live, according to the estimates, more than 50% of the whole European Roma population (Vašečka et al. 2003). We utilize here two kinds of information sources. Firstly, we discuss the relations between the educational enrollment and log GDP (PPP<sup>1</sup>) measures in the corresponding sub-regions of these five countries. We find that there is a notable gap between capitals and other regions within the country. These gaps coincide unfortunately also with enrollment gaps, particularly in pre-school and secondary enrollment rates. This means that the education coverage is unequal throughout the region, as well as within

TABLE 1 Roma population shares throughout the countries considered

Country	(1)	(2)	(3)
Bulgaria	4.6%	10%	700,000–800,000
Czech Republic	0.3%	3%	250,000–300,000
Hungary	4.0%	6%	550,000–600,000
Romania	2.5%	10%	1.800,000–2.800,000
Slovakia	1.6%	9%	480,000–520,000

NOTE: Column headings as follows: (1) World Fact Book (2003 estimates, based on 2001 census); (2) estimates of real proportions; (3) Estimates of real numbers (Vašečka et al. 2003).

the countries. Some of our results suggest that exactly the more Roma inhabited regions are the ones with weaker economic performance and lower enrollment rates. This, more or less intuitive fact, motivates our second part. Here we attempt to show that education matters for Roma as well. The patterns are similar over the whole region and hence a need for systematic and common education policy of Roma is both necessary and beneficial. For this part we use a unique regional dataset from the UNDP/ILO survey conducted in 2001, and estimate rates of return to different education levels for Roma households in these countries.

The presented paper is organized as follows. The next section introduces and discusses relations between sub-national log PPP levels and educational enrollment rates for different levels in 2001. In the third section we compute correlations to assess significant bivariate relations among variables. Afterwards a probit regression is used to estimate an alternative of the Mincerian log wage equation. Predicted probabilities are calculated in order to interpret the relevant outputs of this model. The last section presents the conclusions.

### Educational Attainment and Economic Indicators

The Roma population composes a not negligible part in the considered countries (cf. table 1). One should exactly differentiate between the Roma numbers counted within the national rounds of censuses and the estimates of real amounts. The first number is usually much smaller (column 1) as lots of Roma do not self-identify as members of the majority population in the country they live in. One should rather rely on the estimated proportions (column 2), which are based on surveys and local municipalities' sums.

The situation, in which a big part of the Roma population lives, is

alarming. Long-term unemployment, reaching up to 80–100%, very often connected with extreme poverty, lack of hygiene and basic health care, or strong dependency on social assistance. We believe that at the core of this trap, is insufficient education, which causes disadvantages on the labor market.

It is conventionally assumed that educational enrollment rates and the level of education increase with economic development in the market economy. In the context of transition countries, the case might be different, as enrollment rates in almost all types of education had been already extraordinarily high during socialism, while economic development was stagnating. Since the breakdown of the socialist regime, educational reform has taken place parallel to economic and social turmoil that characterized transition countries. Due to large declines in GDP measures starting at the beginning of transition, two main challenges with respect to education can be identified:

1. As GDP declined rapidly and economic conditions have been unfavorable, governments and households are limited in their ability to finance school costs, and graduates may be limited in their labor market opportunities.
2. Reduced government revenues impede a sufficient provision of quality education.

These impediments led to declines in enrollment rates in the first half of the 1990s (Micklewright 2000). With improving economic indicators, after 1995, enrollment rates started to increase again at national level. However, economic development did not occur equally within the countries but often only in certain regions. In 2001, which is our benchmark year, substantial regional disparities between economic development and enrollment can be observed when having a closer look at NUTS II or III level (nomenclature of Territorial Units for Statistics). This implies threats to future equally distributed prosperity of certain parts of the countries, as education is a core driver of economic growth. In the following part we illustrate several examples of existing regional disparities within, and to a certain extent, between countries. Due to insufficient data sources, a comparison is made only between at most two countries. Moreover, there exist substantial differences between education systems as well as between the state of economic development (three new EU member states, two second-wave candidate countries). Hence, the inter-country comparison should be treated with caution.

Plotting pre-school net enrollment rates against log GDP (PPP) for the Czech Republic and Slovakia in 2001 (cf. fig. 1a on p. 56) shows:

1. substantial disparities between the capitals Prague and Bratislava and the rest of the country,
2. a positive trend in pre-school net enrollment rates with rising GDP and
3. that those regions with a large share of Roma are characterized by lower economic development and lower net enrollment rates.

The GDP (PPP) in 2001 by NUTS II level were calculated from GDP levels in 2001 in national currencies and the average USD exchange rate for 2001. The regions with a large share of Roma population were identified using various expert estimations.<sup>2</sup> Disaggregating the data by NUTS III level in Romania in 2001 (cf. fig. 1b on p. 57) shows also a positive trend between economic development and net enrollment rates. However, the capital Bucharest, displays a surprisingly low level of pre-school net enrollment although having the highest GDP level.

For primary education we observed almost constant net enrollment rates, independent from the magnitude of GDP. This can be easily explained, as universal primary education is obligatory in all five countries and even in disadvantaged regions, universal enrollment is guaranteed.

For secondary education, the situation again looks different (cf. fig. 1c on p. 56). First, a considerable difference can be observed between the economic development level of the two countries examined, the Czech Republic and Bulgaria. Lower average net enrollment rates for Czech regions result most likely from differences in education systems and measurements. Again, within each country, a positive trend between GDP and net enrollment rates can be seen. The two capitals, Sofia and Prague stand out substantially. The regions with a larger share of Roma are characterized again by both lower GDP and by lower net enrollment rates.

Lastly, we look one level deeper and plot net high and vocational enrollment rates against GDP at NUTS III level for Romania in 2001 (cf. fig. 1d on p. 57). Here, there exists again a positive trend with two outliers, one is expectedly the capital, which displays the highest levels of economic development and enrollment in higher education. The second one is a district belonging to Bucharest (Ilfov – black rectangle) with extremely low net enrollment rates compared to its corresponding level of economic development. This might be due to the large share of Roma living in this area.

FIGURE 1A Regional differences in the Czech Republic and Slovakia – pre-school, 2001 (NUTS II)

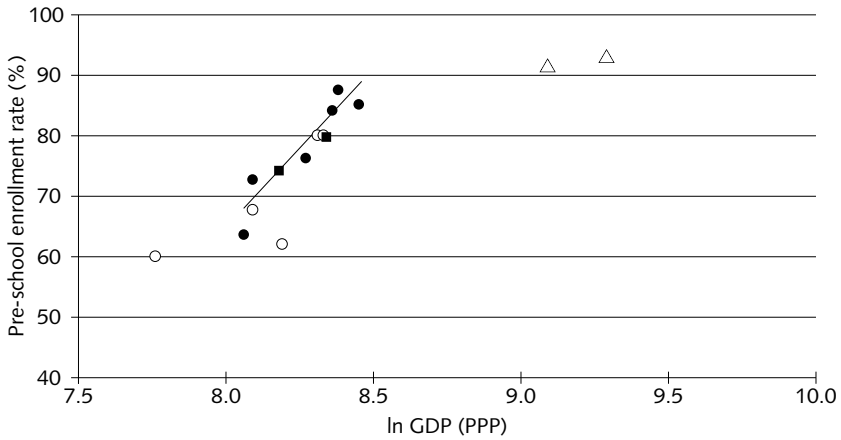
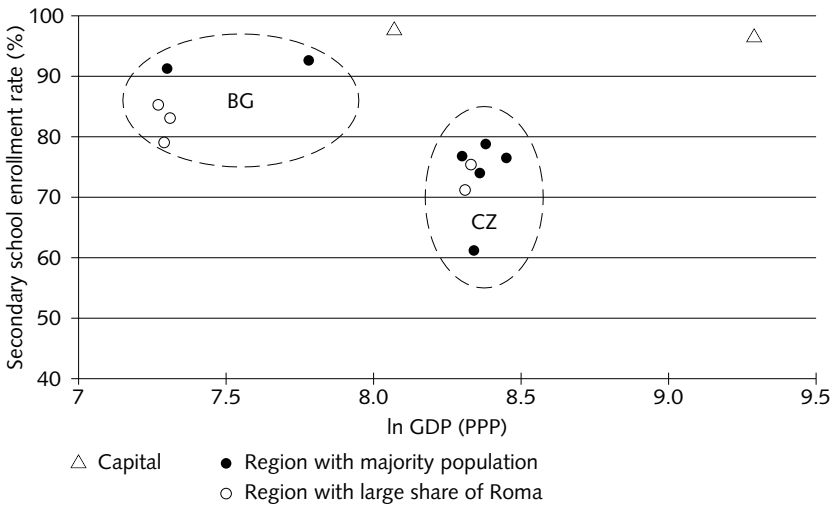


FIGURE 1C Regional differences in Bulgaria and the Czech Republic – secondary school, 2001 (NUTS II)



SOURCE: Statistical Offices of the Czech Republic, Slovakia, and Bulgaria.

The comparisons suggest two implications. First, disadvantaged regions lack opportunities for parents to enroll their children in pre-school and incentives for students to enroll in higher education. There is most likely a lack of funding from local governments to provide pre-school institutions. Moreover, the lack of labor market opportunities is a disincentive for students to proceed with secondary and higher education. The

FIGURE 1B Regional differences in Romania – pre-school, 2001 (NUTS III)

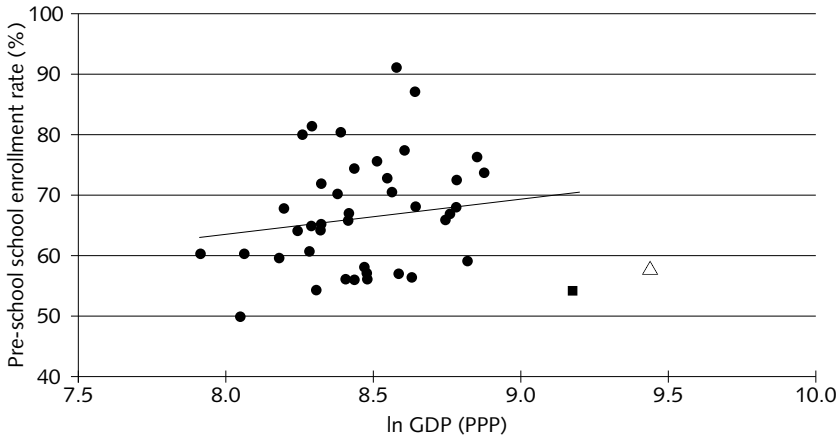
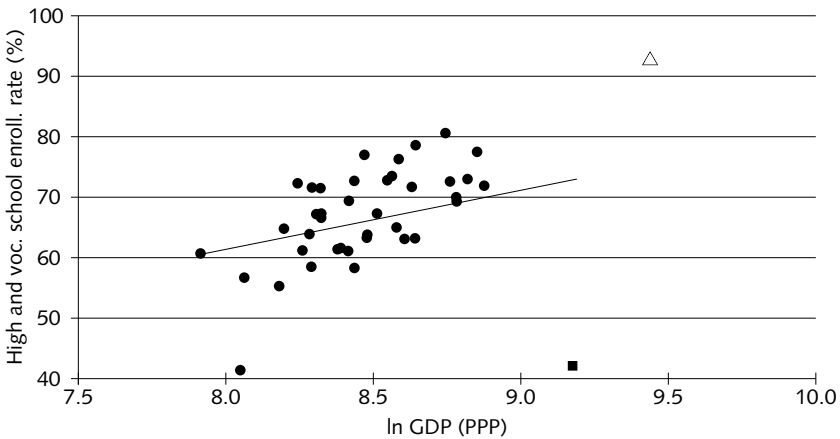


FIGURE 1D Regional differences in Romania – high and vocational school, 2001 (NUTS III)



△ Capital ● NUTS III region

SOURCE: Statistical Office of Romania.

second problem arising here is that poorer regions imply poorer households. They cannot afford pre-school and secondary education if it is combined with fees or requires longer distance travel. Obviously, Roma face all these problems disproportionately, since they live to a larger extent in the identified disadvantaged regions in all five countries. Returns to higher education did not develop fast enough in certain regions to convince the population that the investment in education will bring substantial benefits. In particular, many Roma families face the trade-off

between high costs of education and low chances on the labor market because of low educational achievements.

These regional disparities in enrollment rates will have a large impact on labor market chances and on the economic development of the country in the coming years. Entering the EU, the low enrollment rates in secondary and higher education prevent the creation of a ‘knowledge society’ envisaged in the ‘Lisbon Strategy’ by the European Union. Having in mind that Roma live predominantly in disadvantaged regions, and thus they have weak employment opportunities, a natural question arises. Does it make sense for Roma to invest into education?

### **Returns to Education**

In this section, we address the question of whether the returns to education are present in Roma households. The return to education is already a classic theme in economics, where factors of the individual’s wage are investigated. However, estimating the returns for marginalized groups, in particular for Roma is, to our knowledge, a unique idea.

A significant deviation from the original Mincerian model settings was necessary. Throughout subsequent return-to-education analysis we use solely the *household’s characteristics* rather than individual ones. The reasons for this are twofold. First, the nature of the dataset requires household-based analysis. Second, using households as the unit of analysis has a rationale with regard to Roma lifestyle as well. Roma households are larger and broader than the majority households. This is not only given by the fact that they have more children, but very often brothers and sisters live together even when reaching adult age. Hence, their decisions, in this case educational and working decisions, are very much influenced by the interaction among adult household members.

In the following part, we firstly introduce the data set and main findings from the bivariate analysis, where influential factors of the wage variable are depicted. Finally we set up the model of Roma returns to education and show the main findings and implications.

#### DATA SET

The results discussed in this paper are based on the survey data collected from face to face interviews with 5034 Roma respondents, who represent at the same time a whole household, in Bulgaria, the Czech Republic, Hungary, Romania, and Slovakia. In a number of respects this survey is unique in its scale and consistency over countries. The results from



each country are comparable because they are based on a common questionnaire, translated into the respective local languages and an identical sampling design methodology. The sample size in each country was close to 1000. The survey is a representative sample of the Roma population in a respective country.

#### BIVARIATE RELATIONS

According to the classic study by Mincer (1974), the model estimating returns to education is based on those factors which influence the wage of individuals. Among them, the major role is played by education attained and experience acquired. Indeed, more factors are added to the model depending on the examining data background. Prior to running the model, we analyze bivariate relations with the wage variable, in order to account for its significance and magnitude. This exercise helps us to set up the components of the Roma wage equation. We consider here a set of household variables, in particular, economic, demographic, educational and social ones. Table 2 displays descriptive statistics of these variables. These variables prove to be significant both in the bivariate relation and in the returns to education model.

The proxy of the household's wage is an ordinal variable, which we created on the basis of the question: 'Which sources provide the most money for your household?' We aggregated the sources to four categories with clear ranking. The lowest category consists of sources as loans and remittances from people outside the household. This is clearly the worst version of dependency, as this source is highly informal and fragile. Slightly better is the dependency on the social contributions of various types. Here belong those households which stated child support, unemployment or social benefits as their main sources of money. One rank higher are those households which receive most money from various irregular jobs, mainly without an official contract. Clearly at the top we put households, which receive most of their money from regular wage jobs, mainly with an official contract.

The set of independent variables should necessarily contain two variables: education attained and experience acquired. The first variable is based on the answers to the question: 'What is the highest level of education reached by a member of your household?' Here again, we aggregated the answers into 4 categories with a rank. The lowest rank was assigned to households with no or incomplete primary education, the second rank was assigned to households with completed primary edu-

TABLE 2 Descriptive statistics on Roma population

Variable	Mean	Range	Description of the categories
Wage proxy of a household*	2.72	1–4	(1) loans (2) benefits (3) occasional wage (4) regular wage
Household highest education	2.39	1–4	(1) incomplete primary, none (2) primary (3) apprenticeship (4) completed secondary
Number of working adults	1.83	0–7	(7) = 7 and more working adults in the household
Number of unemployed	1.35	0–6	(6) = 6 and more unemployed in the household
Number of children	1.95	0–7	(7) = 7 and more children in the household
Household neighbourhood	1.77	1–3	(1) principally Roma (2) mixed (3) principally non-Roma
Type of settlement	3.07	1–4	(1) capital city (2) district center (3) small town (4) village
Household welfare	2.01	1–3	(1) low (2) medium (3) high

\* Dependent variable.

cation, third rank was assigned to households with apprenticeship and incomplete secondary education, and the highest, i. e. the fourth category, was given to households which have a member with completed secondary education or higher. For the latter variable, acquired experience, we used the number of unemployed and employed household members. In fact, we built a ratio where in the nominator is the number of working adults compared to the number of adults in the active age (employed + unemployed).

In addition to those two, we included into the model two variables representing localization of the household. The type of settlement ranges from 1 to 4, where 1 stands for capital city, 2 means district capital, 3 represents small town and 4 is village. The household neighborhood ranges from 1 to 3, where 1 means principally Roma neighborhood, 2 is mixed and 3 stands for principally non-Roma neighborhood. Furthermore, we add into the model the number of children and the measure of household welfare, too, as further variables which are usually good in explaining the household background.

Note that the variables in table 2 are ordinal, exclusively. Hence, we use the Spearman Rho measure of bivariate correlation, which is an ordinal

TABLE 3 Bivariate relations for household wage and set of variables

Country	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Bulgaria	0.110**	0.246**	-0.183**	0.000	-0.163**	0.313**	-0.181**
The Czech Rep.	0.295**	0.395**	-0.418**	0.237**	-0.024	0.342**	-0.177**
Hungary	0.331**	0.292**	-0.236**	0.202**	-0.102**	0.315**	-0.160**
Romania	0.163**	0.082*	0.037	0.128**	-0.111**	0.227**	-0.074*
Slovakia	0.268**	0.370**	-0.373**	0.207**	-0.102**	0.354**	-0.178**
All countries	0.202**	0.290**	-0.278**	0.176**	-0.178**	0.269**	-0.165**

NOTE: Column headings as follows: (1) household highest education; (2) working adults in the household; (3) unemployed in the household; (4) household neighbourhood; (5) type of settlement; (6) household welfare; (7) children in household.

We use here the Spearman Rho as a measure of correlation. We indicate with \*\* and \*, measures significant at 99%, or 95% significant levels respectively.

alternative of ordinary correlation measures. The results for all countries as well as for each single country are presented in table 3.

The household education, number of working adults, household neighborhood and household welfare have a positive impact on the wage level. On the contrary, the number of unemployed household members, the geography, expressed as type of settlement, and the number of children have a negative influence. The negative sign of the number of children is especially serious, as it expresses the risk of poverty of large households, but it might also be a sign for disincentives to look for a regular job, if the contributions (in this case child support) are offering the existence minimum for the household. The type of settlement is clearly negative and presumably would be negative also for other population groups, and expresses rather the economic gap between rural and urban regions or the gap between capitals and other municipalities. What attracts attention is a similar magnitude of influence of the variable number of working adults and unemployed household members, with opposite signs. An additional correlation test between these two variables reveals very high correlations. Hence a combination of these two variables was used in the final model, as described above. If comparing the magnitudes on the overall level, the education and the two variables expressing the working experience of the households have the strongest effects.

If we look closer at inter-country differences, remarkable and very interesting deviations from the all countries correlations are revealed, how-

ever the signs remain. In particular, a still repeating pattern can be observed. The three, so-to-say advanced countries, i. e. the Czech Republic, Hungary and Slovakia have similar magnitudes, while the less advanced countries, Romania and Bulgaria have remarkably different magnitudes than the three others. In the case of education, it has a stronger impact on wage levels in advanced countries, while the type of settlement has significantly stronger correlations with wage level in less advanced countries. This coincidence is especially interesting with regard to the number of unemployed household members. In the advanced country group we observe much stronger negative impacts than in the less advanced country group. Unfortunately, this ought to be again the effect of a generous social welfare system, which offers little motivation towards seeking for a serious job.

#### ROMA RETURNS TO EDUCATION

In this section we introduce our empirical findings on the returns to education model for Roma households. Recall that our observations are households rather than individuals. In addition our dependent variable, household wage, is an ordinal variable and hence we use the probit model to assess the returns to education. The set of our independent variables consists of three education dummies, where primary education is the base category. Moreover, we include a proxy for household experience, as explained above; geographic ordinal variables: type of settlement, neighborhood; a demographic variable: number of children in a household; and a proxy for household welfare. Finally we considered four country dummies, which grasp the unobservable country specific effects. Here, Slovakia serves as a base category. In table 4 we display the estimation results from the probit model of four distinct wage categories for 4481 Roma households<sup>3</sup> in five European countries. The estimated parameters, except for significance, do not have a direct explanation, as the probit specification is a nonlinear model. Therefore, various transformations are used in order to interpret the values (Scott-Long 1997).

In our paper we use transformations into predicted probabilities and will observe the tendency of change within predicted probabilities for four distinct wage groups, given changes of some variables. In our specific Roma household model, one can explain the concept of predicted probabilities as follows. A predicted probability for one category of wage proxy variable is a probability, with which a Roma household can appear in this category, holding the set of independent variables constant

TABLE 4 Estimation results

Variable	Parameter estimates
Education dummy – incomplete primary, none	-0.091*
Education dummy – apprenticeship	0.191**
Education dummy – completed secondary and more	0.290**
Ratio – household experience	0.968**
Type of settlement	-0.098**
Household neighborhood	0.097**
Number of children in household	-0.079**
Household welfare	0.344**
Country dummy – Bulgaria	0.452**
Country dummy – The Czech Republic	0.160**
Country dummy – Hungary	0.310**
Country dummy – Romania	0.344**
Pseudo $R^2$	0.106
Number of households, $N$	4481

at their means (Scott-Long 1997). In addition to this basic definition, the researcher can go further and change the means of some variables and observe the underlying changes in the predicted probabilities. For us the variable of crucial interest is household education and experience. In fig. 2a, we display the predicted probabilities for levels of education, holding the rest of the independent variables constant at their means. In fig. 2b–d we additionally drop down the predicted probabilities with regard to education into three country groups that showed similar predicted probability patterns.

The pattern for all countries shows that there is a rapid increase in the probability of obtaining a regular wage job if one household member has higher education. At the same time, there is a slightly weaker, but still remarkable decline of the probability appearing in the passive-beneficial group. However, even with higher education, the probability of regular job wage households does not cross the one of households receiving benefits. The probability of occasional wage income is relatively stable (around 16%), across all education levels and the probabilities of households living on loans are in general negligible, but still we observe a weak decline with increasing education.

Separating these results for various country groups, we reveal signifi-

FIGURE 2A Predicted probabilities for all countries

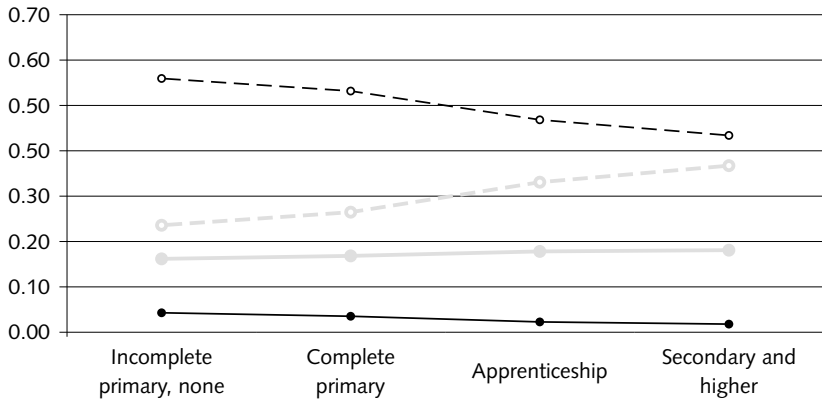
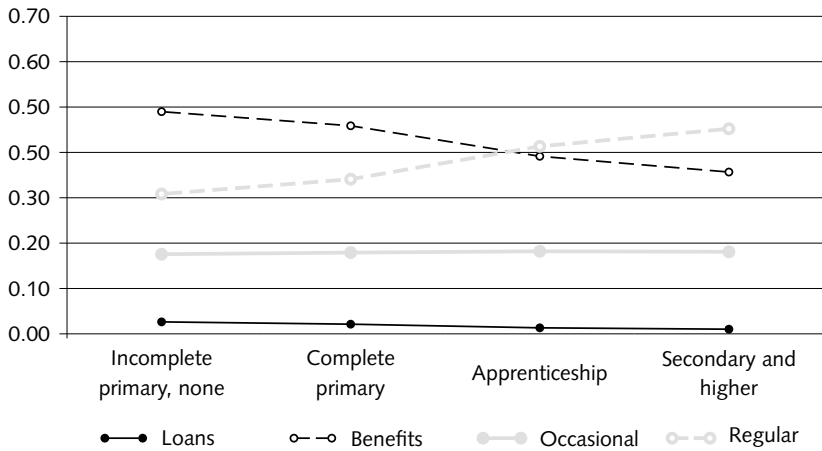


FIGURE 2B Predicted probabilities for the Czech Republic and Hungary



cant deviations, especially for beneficiary and regular wage probabilities. For example, in the advanced countries, such as Hungary and the Czech Republic, we witness that those households with regular wage income achieve in the two highest education levels higher probabilities than the beneficiaries group. An even more optimistic picture can be observed for the two less advanced countries in our sample: Bulgaria and Romania. Here, the probabilities have the same tendencies as observed before, though the probability level of regular wage receivers is throughout all education levels the highest and reaches almost 60% for households with secondary educated members. The picture in Slovakia shows rather the opposite. Here the tendencies are similar, but we observe a tremendously

FIGURE 2C Predicted probabilities for Bulgaria and Romania

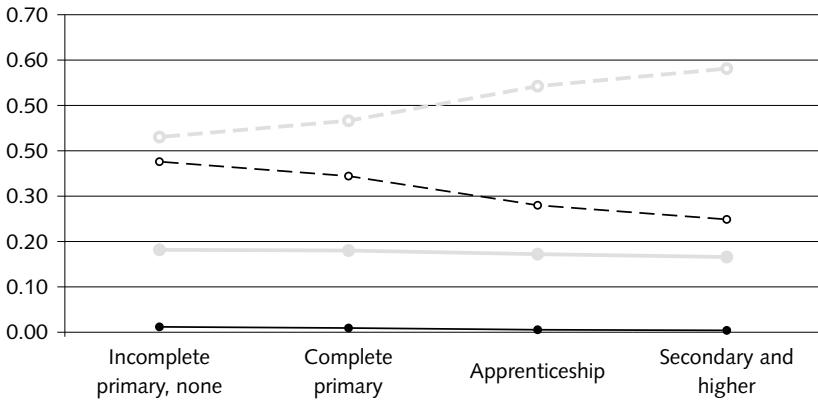
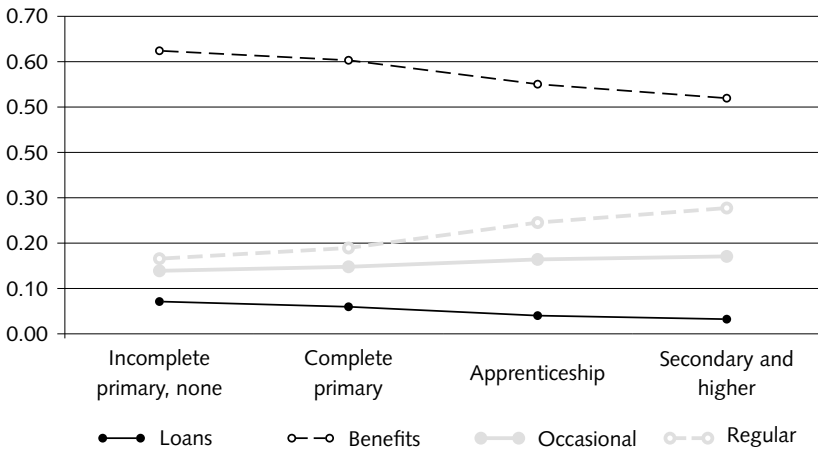


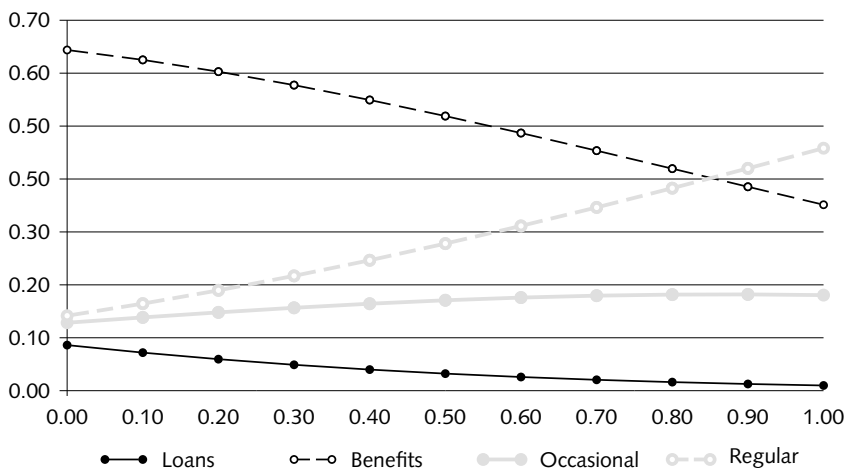
FIGURE 2D Predicted probabilities for Slovakia



high probability of beneficiary households, which is always the prevailing and reaches approximately 50% even for the highest education level. This is due to the very generous system of social benefits in Slovakia. In this country, the level of social benefits could reach the minimum wage and hence this system does not offer enough incentives to find a job if having achieved only little education. These inter-country deviations suggest the following remarks:

1. The education status matters throughout all countries.
2. However, it matters more in the less advanced countries, perhaps also because of weak social systems, but this is also supported by other studies (Psacharopoulos 1994).

FIGURE 3 Predicted probabilities for four wage categories with respect to the ratio of household experience



3. Whenever the system is too generous, it produces weak incentives to find a regular job, which ought to be the case of Slovakia.
4. The probability of occasional or irregular wage receivers is robust throughout the countries and education levels. It seems that 15% to 18% of Roma households are involved in the informal sector.

Another issue is that the weight of the education variable is on the first three education categories, while the last category is very weak in comparison to the majority population. Furthermore, in this education category, also few university educated Roma households (0.5%) are aggregated. Hence, computing returns to education for the tertiary education was impossible.

The return to education literature suggests that experience has a serious impact on wage. Our experience variable expresses the ratio of household members who are employed to that of all members in the active age. The Roma households as mentioned before are a bigger entity and the decisions here are made upon approval of all adult members. Hence the employed members might pursue the rest of household members to search for a serious wage job. This hypothesis is supported by fig. 3.

The higher the ratio of household experience, the lower is the probability of family members being the benefits receiver and conversely the higher is the probability of their having a regular wage income. The threshold is however relatively high, if more than 85% of adult mem-



bers are employed, the probability starts to be higher than the probability of being among the pure benefits receivers. Here again the probability of the loans group almost disappears and occasional wage jobs increase with only a negligible gain.

The results of our empirical analysis support the traditional hypothesis of the returns to education theory. The probability of being in the regular wage receivers group grows with the level of schooling and with work experience. This means that, given our sample, larger returns to education for higher educated Roma do exist, despite the unfavorable economic and social conditions.

### **Conclusion**

This paper presents a unique analysis of returns to education for Roma in five Central and Eastern European countries (Bulgaria, the Czech Republic, Hungary, Romania and Slovakia) based on data from the UNDP/ILO survey conducted in 2001. The evidence from existing qualitative studies on the situation of Roma in Central and Eastern Europe suggests that low education levels are one of the main reasons for unemployment and poverty (e. g. UNDP 2002). The unfavorable starting position of the Roma at the beginning of transition in terms of low education levels and over-representation among the unskilled workers, has led to disadvantages on the labor market and dependence on the welfare system. Their over-representation in disadvantaged regions also affects decision-making and incentives for education. This situation leads to a vicious circle of increased poverty that in turn further impedes access to quality education. The current state of research on the situation of the Roma raises the question whether returns to education for Roma do matter and, if yes, to what extent.

The descriptive analysis in the second section revealed that in the examined countries, substantial within-country disparities exist in terms of economic development and enrollment rates for different types of education. A general pattern of increasing enrollment rates with rising GDP can be observed. Several regions face a substantial gap in providing enough education institutions, especially pre-school. On the other hand, in these regions incentives for proceeding with higher education are weak, due to the low level of economic development. Roma in all five countries live predominantly in those disadvantaged regions and suffer from these drawbacks to the largest extent. Therefore, it is important to prove that education matters even in these difficult situations.

Due to the difficulties of monitoring the Roma population in these countries, studies on returns to education for Roma literally do not exist. While returns to higher education had been undervalued in Central and Eastern Europe during the planned system, they rapidly increased during the beginning of the 1990s and have reached levels similar to those of other developed market economies. Unfortunately, this change does not affect Roma much, as they are usually low educated.

But still the results of the empirical analysis support higher returns to education for higher educated Roma. The probit model confirms that, in controlling for other household characteristics, returns to education are present. The probability of being dependent on state benefits is decreasing and the probability of having a regular wage income increases with education level, respectively. Similarly, with increasing experience, the probability of being dependent on benefits declines and conversely the probability of having a regular job income increases.

The results have remarkable implications for future policies, not only within each country but also in terms of the enlarged Europe. Regional disparities and minority issues have become even more transparent and will be the subject of discussions. In order to converge to EU levels in all economic spheres, education has a major role to play. When thinking about the European Union's strategy of creating a 'knowledge society', this does not only apply to the Roma minority but to the whole population, as well. It cannot be efficient to set up a large variety of separate projects dealing with Roma education. Rather the opposite, a reform of the mainstream school system seems to be a prerequisite to establish long-term success and effects. The main objective remains: successful integration of Roma into the national school system.

### Notes

1. We always use log GDP measured in PPP dollars.
2. Statistical Office, Czech Republic; Institute of Public Affairs, Slovakia and UNDP Bulgaria.
3. We are lacking several households, from the original 5034, because of missing observations within the considered set of variables.

### References

- Chase, R. S. 1997. Markets for communist human capital: Returns to education and experience in post-communist Czech Republic and Slovakia. *Industrial and Labor Relations Review* 51 (3): 401–23.

- Filer, R., S. Jurajda, and J. Plánovský. 1999. Education and wages in the Czech and Slovak Republics during transition. *Labour Economics* 6:581–93.
- Flanagan, R. J. 1995. Wage structure in the transition of the Czech economy. IMF Working Paper 95/36.
- Halpern, L., and G. Kőrösi. 1997. Labour market characteristics and profitability: Econometrics analysis of Hungarian firms, 1986–95. The William Davidson Institute Working Paper 41.
- Jones, D. C., and K. Ilayperuma. 1994. Wage determination under plan and early transition: Evidence from Bulgaria. Working Paper 94/7. Department of Economics, Hamilton College.
- Micklewright, J. 2000. Education, inequality and transition. Innocenti Working Papers. Economic and Social Policy Series 74. Florence: UNICEF Innocenti Research Centre.
- Mincer, J. 1974. *Schooling, experience, and earnings*. New York: National Bureau of Economic Research.
- Psacharopoulos, G. 1973. *Returns to education: An international comparison*. Amsterdam: Elsevier.
- Psacharopoulos, G. 1985. Returns to education: A further international update and implications. *Journal of Human Resources* 20 (4): 583–604.
- Psacharopoulos, G. 1994. Returns to investment in education: A global update. *World Development* 22 (9): 1325–43.
- Psacharopoulos, G., and H. A. Patrinos. 2002. Returns to investment in education: A further update. World Bank Policy Research Working Paper 2881.
- Scott-Long, J. 1997. *Regression models for categorical and limited dependent variables*. Advanced Quantitative Techniques in the Social Sciences 7. Thousand Oaks, CA: SAGE Publications.
- UNDP. 2002. *The Roma in Central and Eastern Europe: Avoiding the dependency trap*. Bratislava: United Nations Development Programme.
- Vašečka, M., M. Jurásková, and T. Nicholson. 2003. *Čačipen pal o Roma: A global report on Roma in Slovakia*. Bratislava: Institute for Public Affairs.
- World Bank. 2001. Slovak Republic: Living standards, employment and labour market study. Report 22351-SK.