

# Do family resources matter?

## *Educational attainment during transition in Poland\**

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### **Abstract**

We analyse the relationship between family background and children's educational attainment in the 1990s in Poland. If parental poverty affects children's educational prospects, the increase in social inequalities observed in the Polish transition process will be transmitted between generations. We apply an ordered probit model of educational attainment on longitudinal data from the Polish Labour Force Survey. Surprisingly, parents' income and their labour market status have only a weak impact on children's education. Parents' schooling, however, is strongly related to children's, and so are household structure, city size, and region of residence. We conclude that, if transmission of inequality takes place between generations, this seems to be primarily caused by the inheritance of human capital rather than by pure wealth effects.

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## 1. Introduction

While the transition process from a centralized to a market economy in Poland has led to an increase in the average standard of living of the population, it has also been accompanied by a deepening of inequality across households in terms of socio-economic status and income. The question arises of what will be the implications of this rise in inequality for Polish society. In particular to the extent that inequalities are transmitted from one generation to the next, the transition process might have repercussions which go far beyond the transition period itself.

The family is the crucial link that passes socio-economic endowments of the older generation to the younger one. If coming from a poor family proves to have a large impact on children's educational prospects, social inequalities are likely to be passed on over generations. Indeed, the level of education is known to be an essential determinant of subsequent labour-market outcomes and socio-economic success. From the literature we know that the risk of experiencing poverty is strongly affected by the level of education achieved. For university graduates, the risk of falling into poverty is three times lower than that for other households (Okrasa, 1999a). As Golinowska (1998) states, the overall rise in income inequality across Polish families, accompanied by increasing costs of education, has induced the fear that young people will face increasingly unequal opportunities. These observations led us to examine the extent to which family background, and in particular family wealth, has an impact on children's educational attainment in Poland.

The expansion of poverty and inequality in Poland throughout the early transition period is well-documented in the literature.<sup>1</sup> Although the impact of education on the risk of experiencing poverty has been pointed out frequently, detailed microeconomic analysis of the relationship between family resources and educational attainment during transition has been rather neglected so far. Available data sources such as the Polish Labour Force Survey (PLFS) provide information on the social situation as well as on the education level of all household members over the 1990s. These data enable us to pursue the aim of our paper and investigate how socio-economic and family characteristics relate to children's educational outcomes.

The paper is organized as follows. After a description of the Polish education system, we provide an overview of the structure and developments in the distribution of educational attainment for our sample of the PLFS (Section 2). Next, we outline the mechanisms by which inequalities may be transmitted from parents to children through the educational achievement of children and review the empirical evidence available for Poland so far (Section 3). We then move to the econometric analysis of the link between family background and children's educational attainment (Section 4). We first present the modelling framework, explain the sample and the

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<sup>1</sup> See for example, Golinowska (1997), Kotowska (1997, 1998), Szulc (1997), Okrasa (1999a, 1999b) and the World Bank (1994, 1995). More recent work includes Keane and Prasad (2002), Sibley and Walsh (2002) and Beblo *et al.* (2002).

variables used for the estimation and finally present the estimation results. The paper concludes with a discussion of the results (Section 5).

## 2. Educational attainment in Poland

### 2.1 *The Polish education system*

In this section, we describe the Polish education system as it was organized throughout the period under consideration (see Figure 1). The exposition largely follows that of the Education Information Network in Europe (Eurydice, 1999). In 1999, a reform of the education system took effect. Structural reforms at the primary level were introduced in 1999/2000 whereas the reform of the upper secondary education level began in the school year 2002/2003. Since the data available to us only cover the pre-reform period, we will restrict our description to the old system. However, we will point out changes where applicable.

The first level is the mandatory pre-primary education for children aged three to six in nursery schools and pre-school classes attached to primary schools. Primary schools are divided into two stages: the first stage offers elementary learning and the second stage provides systematic teaching. All children attend a single structure for primary education until age 14. After primary school, pupils have the choice between general secondary education, a mixture of general and vocational, as well as vocational/technical education or a basic vocational school.

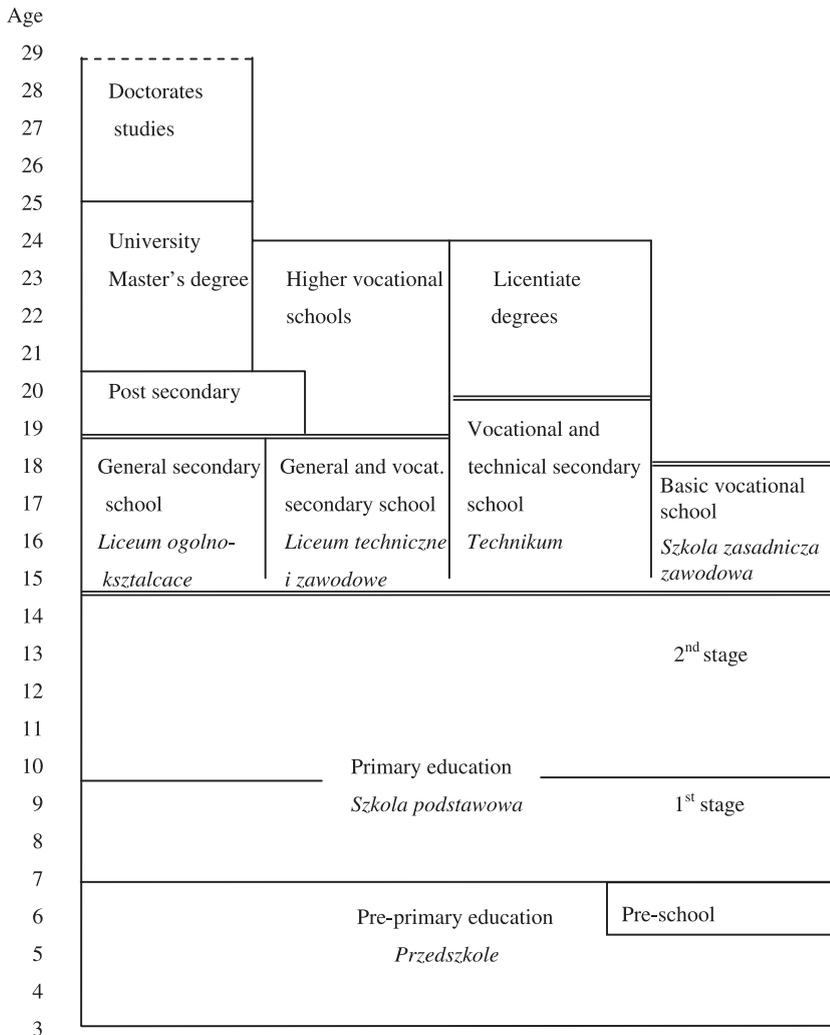
At the end of the first three types of school<sup>2</sup> pupils may take an examination by which they qualify for admission to higher education. Graduates from upper secondary schools in Poland have a wide variety of educational possibilities at the level of tertiary education. Those who do not pass the matura examination or who are not accepted by higher education institutions may continue their education in post-secondary schools. Basic vocational school graduates receive the qualification of skilled workers. Post-secondary schools, of 1 to 2.5 years duration, are also considered as part of secondary education in the Polish classification because they prepare students for professional life by training them as nurses, accountants, administrative personnel for enterprises and hotels, computer specialists or librarians.

Finally, there are various types of non-university and university higher educational institutions: teacher training colleges, traditional universities, technical universities and academies. At the end of 3 to 4-year higher vocational education, students are awarded the vocational qualification diploma corresponding to a bachelor, which gives them access to the job market or to extended higher studies. Universities and university-type institutions with uniform master-degree studies are entitled to

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<sup>2</sup> These types of educational institutions were replaced by a single one, the *Liceum profilowane* in the school year 2002/2003 and will completely disappear by 2004/2005.

Figure 1. The Polish education system



award the professional titles of master, master-engineer and doctor of medicine. Successful graduates can apply for a doctorate.

Liberalization and privatization, as two systemic changes accompanying the transformation to a market economy, have had diverse effects on the costs and benefits of education in Poland. While the liberalization of the labour market has led to higher returns to education in terms of job prospects and wages, thereby increasing the incentive to invest in education, the privatization of the education

system has resulted in increasing disparities in quantity as well as in quality of educational institutions, particularly outside urban areas (United Nations, 1998). Moreover, access to education depends more than before on the income level of the parents due to the decline in state expenditures.<sup>3</sup> The decentralization of education services together with insufficient funding at the local level has also meant an increase in the costs to be covered by the student's parents. In this context, it seems essential to examine whether parental income does affect children's educational prospects.

## *2.2 The distribution of educational attainment*

To investigate the structure and the determinants of children's educational attainment in Poland, we use data from the Polish Labour Force Survey (PLFS) for the years 1992 to 2000. This way, we cover most of the transition process with less emphasis on the early recession period. The PLFS as a national panel survey is conducted every three months (Szarkowski and Witkowski 1994). After four preliminary quarters starting in May 1992, and repeated sampling of the same households, a rotation system was introduced in May 1993. According to this system, one completely new sample of housing units is selected by two-stage sampling in each quarter. Each sample is used following a 2-(2)-2 rule. This means that a selected household stays in the survey for two quarters, is out for the next two quarters and back again for another two quarters before it is finally discharged. The survey is targeted at all persons aged 15 and above. The respondents fill in two questionnaires: the first one asks for general characteristics at the household level, registering all household members (including children) and gathering information on the housing circumstances and the family relations of all members. The second questionnaire covers only those persons aged 15 and above living in the household. It collects information on socio-demographic and labour-market characteristics at the individual level.

We are interested in the link between the highest education level attained by individuals and some essential characteristics of their family background. For this purpose, information about parents is one of the most important ingredients. Unfortunately, the PFLS does not contain questions on the respondents' parents. However, by means of a household identification number, it is possible to match individuals with their parents provided they live in the same household. Since the likelihood of having left the parental household and living on one's own rises with age, we need to focus on younger individuals. For the purpose of the analysis, we have drawn a sample of individuals whom we could link to their parents, that is who are young enough to minimize sample selectivity problems but at the same time old

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<sup>3</sup> In 1992, state support for education was only 80 percent of that in 1989, in 1996 it amounted to 90 percent (United Nations, 1998).

**Table 1. Construction of the education level variable**

<b>Education level variable</b>	<b>Highest degree obtained</b>	<b>Enrolled</b>
Level 4: Higher education	University	yes or no
	Post-secondary/vocational/general school	yes
Level 3: Secondary education	Post-secondary school	no
	Vocational school	no
	General school	no
	Basic vocational school	yes
	Elementary school	yes
Level 2: Basic vocational education	Basic vocational school	no
Level 1: Primary education	Elementary school	no
	Less than elementary school	yes or no

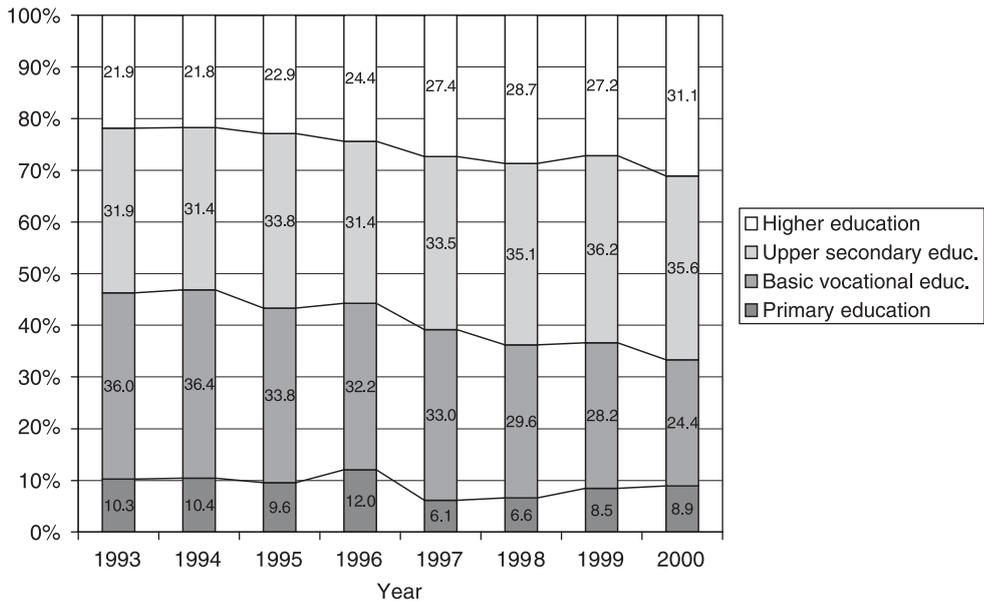
enough to have finished education or be about to finish it. After trying a range of ages for the definition of the sample, we finally selected a sample of 21 year-olds.<sup>4</sup> This way we can maximize the proportion for which we are able to gather information on the family background (about 65 percent) while having a reasonable number of people who have finished schooling.<sup>5</sup>

However, we need to take into account that a non-negligible part of the 21 year-olds has not yet finished education at that age and is still enrolled in education (see the pattern of enrolments by age in Figure A1 in the Appendix). The PFLS provides information on the highest degree obtained, and also whether the person is currently enrolled in education or not, though not the specific level of education the person is enrolled in. We combine this information to construct four levels of educational attainment, ordered by level, as illustrated in Table 1.<sup>6</sup>

<sup>4</sup> The same analyses applied to samples of 20 and 22 year-olds does not change the results significantly.

<sup>5</sup> Because of the selection this sample can certainly not be considered as strictly representative of the whole 21 year-old population in Poland. Nonetheless it enables us to draw qualitative results on the structure of educational attainment and its basic links with family background, which is the focus of this paper.

<sup>6</sup> It may be argued that students combined in the higher education group consist of two distinct groups: students who will eventually obtain a degree and those who are currently enrolled in higher education but will never finish their studies. We therefore perform a sensitivity analysis on 25 year-olds. Though the data do not allow us to distinguish between both groups directly, the estimation results of the 25 year-old sample may provide an indirect test because the majority of the drop-outs have already left university by age 25 and, hence, are no longer included in the highest but in the second category of the dependent variable. That is, the number of potential drop-outs is substantially lower in the group of 25 year-olds than among the 21 year-olds. A comparison of the estimation results of both samples shows that there are no systematic differences between the two.

**Figure 2. Highest education level of 21 year-olds over time**

*Source:* Own calculations based on data from the PLFS, waves 1993–2000.

Figure 2 displays the structure of educational attainment as defined in Table 1 for our sample of 21 year-olds over the time period 1993 to 2000. Observations from the first wave gathered in 1992 could not be considered since no question concerning the highest level of education attained by the respondents was asked that year. As can be seen, the educational distribution is strongly concentrated around intermediate qualification levels. Thus, the bulk of young Polish people has received basic vocational education or upper secondary education at most, while comparatively few people have attained higher education and even fewer hold only a primary education qualification. Considering developments over time, we can see that there has been an educational upgrade during the period observed, with a decreasing percentage of persons with poorer educational attainment and an increasing proportion of persons with a higher educational attainment.

The proportion of graduates from tertiary level institutions has increased particularly strongly. In 2000, almost a third of the cohort born in 1979 had reached the university level. At the same time, the proportion of basic vocational certificate holders had decreased, especially since 1998. The proportion of 21 year-olds with completed primary education only also decreased between 1996 and 1997 but is now slightly increasing again.

### 3. The link between family background and educational attainment

#### 3.1 *Transmission mechanisms*

The availability of financial resources within the family might affect the offspring's educational outcomes. Indeed, the acquisition of education may be viewed as an investment, since it entails costs<sup>7</sup> in the hope that it will bring about enhanced earnings in the future (see Becker, 1964, and Mincer, 1974). For initial education, the investment has to be supported by the parents, who are supposed to have an interest in the well-being of their offspring, i.e., to be altruistic to some extent. Thus, children's educational outcomes depend on intra-family transfers. In the presence of imperfect capital markets, investment in education might be limited by credit constraints (see Rosenzweig and Wolpin, 1993).

The positive correlation between family income and school attainment has been the focus of contemporary research, particularly for the United States (see e.g., Solon, 1992; Hill and Duncan, 1987; Taubmann, 1989), and has been widely interpreted as evidence for borrowing constraints. However, recent studies (Cameron and Heckman, 1998; Shea, 2000) have contested the causal nature of the link between family income and children's educational attainment, arguing that higher educational achievement is not necessarily generated by parental income *per se* but rather by the unobserved learning ability. The commonly observed effect of parental income on education would then only reflect the correlation between parental income and unobserved parental ability, which, in turn, is correlated with children's ability. If parental income appears to affect children's education in Poland, even when controlling for other explanatory factors, the widespread phenomena of income inequality and unemployment observed in the course of transition to a market economy will have repercussions on the educational attainment of the subsequent generations.

Becker and Tomes (1986), and more recently Ermisch and Francesconi (2001), point to the fact that part of a child's human capital is 'inherited' through the transmission of genetic and cultural endowments from parents to children. The greater the degree of inheritability, the more closely related the education of parents and children is. Sociologists and psychologists insist on the role of peer effects, meaning that adults or peers set norms of desirable behaviour and achievement (see Haveman and Wolfe, 1995). Thus, the educational attainment of the children is influenced by their social background through the transmission of ability as well as of certain patterns of behaviour, preferences and expectations which, to some extent, are internalized by children as standards and affect their cognitive and social-psychological development.

Moreover, children will also be affected by parental decisions such as the number of siblings, the region where the family lives or the family structure

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<sup>7</sup> This involves the direct costs associated with education, but also the opportunity costs caused by the time devoted to education and thus diverted from the labour market and potential earnings.

(Haveman and Wolfe, 1995). Because they generally have fewer potential wage-earners, single-parent families tend to have poorer access to financial resources than two-parent families (Boggess, 1998). They also have less time to spend with their children, supervising them or assisting them in their school work. A working mother also has less time to devote to her children, but in this case, there is a trade-off between monetary and time resources. The increased parental income associated with the mother's work might offset the reduction in child care time. In addition there is the cultural aspect of the mother's job status that might have an impact on (particularly female) children's education. Here, the evidence is contradictory. Hill and Duncan (1987), for instance, find a negative relationship between completed education and mother's work hours, whereas Boggess (1998) does not find any significant impact of mother's employment on children's educational attainment.

### *3.2 Evidence for Poland*

There is very little evidence on the impact of family background variables like parental income and education, occupational status or family structure for Poland. Among the few exceptions, Heyns and Bialecki (1993) examine the impact of the socio-economic background, as measured by the father's education and occupational prestige, on educational attainment for cohorts born between 1920 and 1969. The authors note that upward social mobility is traditionally low in Poland and children largely replicate the educational attainments of their parents, which is also argued by the United Nations (1998). Heyns and Bialecki (1993) find that the effect of parental status does not vary across cohorts, and that father's education is a far stronger variable in predicting the educational attainment of Polish children than occupational variables. The authors conclude that the increase in access to education seems to result from a larger availability of schooling rather than from a change in the socio-economic determinants of educational success. These results stand in contrast to the analysis of the United Nations (1998), which covers a different time period, namely the transition period. According to the United Nations' report (1998), there is evidence that the general educational expansion in Poland since 1989 went along with an increase in social disparities in access to education. The report also points toward an increase in regional disparities, since young people coming from rural areas experience increasing difficulty in gaining access to all levels of education.

## **4. Econometric analysis**

### *4.1 Modelling framework*

There is no consensus in the empirical literature on how to model the determinants of educational achievement. A widely applied approach, following Boudon (1974)

and Mare (1980), is the so-called schooling transition model. Mare (1980) argues that the most common approach to analysis of the determinants of total schooling years is not informative because the final amount of education received is the result of a sequence of transitions within the education system. He therefore advocates examining the determinants of the transitions. Cameron and Heckman (1998), however, have criticized the schooling transition model as it is applied in the empirical literature. Their main objection relates to educational selectivity. Indeed, the schooling transition model ignores the consequences of factors which are not observable to the scientist but may influence schooling transitions, such as ability or motivation. These unobserved factors may be correlated across transitions. This leads to a dynamic selection bias since, after each transition, only a certain type of student – say, the most able or motivated – remains in the sample as the basis for the next transition. In other words, the sample composition becomes progressively selective with respect to unobserved heterogeneity. Cameron and Heckman (1998) suggest replacing the schooling-transition model with a structural model of educational attainment. The latter can be estimated as an ordered probit.

For this purpose we suppose that, for each individual, there exists an optimal amount of education he or she would ideally like to attain, given his or her individual constraints. Let us denote this desired level of educational attainment by  $E^*$ .  $E^*$  is a continuous variable which is not observable. What can be observed is the actual decision of the individual given some characteristics, i.e., the educational level  $E$  chosen among the  $J$  possible educational alternatives  $E_j$  which can be ranked according to their levels, with  $j \in \{1, \dots, J\}$  and  $j = 1$  corresponding to the lowest and  $j = J$  to the highest educational level. The observable educational choice depends on the desired level of schooling and on the opportunities available.

The decision on educational attainment is assumed to be rational in the sense that it maximizes the net perceived utility for the individual, subject to (budget or time) constraints. Note that it does not matter who in fact makes the decision, whether it is the individual herself or somebody else (the parents, for instance). What counts is the outcome of the decision among the possible alternatives. Let us suppose that, for each individual  $i$ , with  $i \in \{1, \dots, N\}$ , the desired level of educational attainment can be expressed as a linear function of a vector of individual characteristics  $x_i$  and a residual term  $\varepsilon_i$ . Thus, we have:

$$E_i^* = \beta x_i + \varepsilon_i.$$

As mentioned previously, we do not observe the continuous variable  $E_i^*$ , but the discrete level  $E_{ij}$ , which is defined to take a value  $E_{ij}$ , with  $j \in \{1, \dots, J\}$ , if  $E_i^*$  falls within a certain range  $[\mu_{j-1}, \mu_j]$ , with  $\mu_j = +\infty$  and  $\mu_0 = -\infty$ :

$$E_i = E_{ij} \quad \text{if} \quad \mu_j \geq E_i^* > \mu_{j-1}$$

Assuming that the residual terms  $\varepsilon_i$  are normally distributed with mean 0 and variance  $s^2$ , we obtain for all individuals  $i \in \{1, \dots, N\}$  and educational levels  $j \in \{1, \dots, J\}$ :

$$\text{Prob}(E_i = E_{ij}/x) = \Phi\left(\frac{\mu_j - \beta x_i}{\sigma}\right) - \Phi\left(\frac{\mu_{j-1} - \beta x_i}{\sigma}\right),$$

where  $\Phi$  is the cumulative standard normal distribution function.

This ordered probit model can only be identified up to a proportionality factor. Since we can only identify the ratio of the parameters with respect to  $s$ , the usual procedure in such models is to normalize  $s$  to 1 (see Maddala, 1983, p. 23). The parameters  $\beta$  and the threshold values  $\mu$  can be estimated by maximizing the likelihood function:

$$L = \prod_{i=1}^N \prod_{j=1}^J [\Phi(\mu_j - \beta x_i) - \Phi(\mu_{j-1} - \beta x_i)]^{I_{ij}},$$

where  $I_{ij}$  is an indicator variable equal to 1 if individual  $i$  opts for educational level  $E_j$  and 0 otherwise.

## 4.2 Sample and variables

We apply this ordered probit model to the sample of 21 year-olds from the Polish Labour Force Survey for whom we were able to match the information on their parents. The final sample contains 4,136 observations and covers the years 1993 to 2000. The survey year 1992 cannot be considered due to missing information on the completed education level. The dependent variable is the highest education level attained in four ordered levels as defined in Table 1. To stick to the model notation,  $E_1$  is the lowest level of educational attainment and is defined as primary education or less,  $E_2$  corresponds to basic vocational education,  $E_3$  to upper secondary education and the highest attainable education level  $E_4$  is defined as higher education. As explanatory variables in the vector  $x_i$ , we use several indicators of parental wealth, parents' human capital as well as various indicators of individual characteristics and family structure as further controls.

In order to uncover the nature of the relationship between social inequality and children's opportunities, we start by investigating the link between parental income and educational attainment. Unfortunately, no information on total household income has been collected in the PLFS. However, we do have information on parents' labour income. Due to a currency reform in Poland and due to high inflation rates, income is not easily comparable between waves. Therefore, we use a relative measure of parental labour income which indicates the ratio of total parental labour income to mean labour income of the year considered. For an average income, the value of this variable will be one, for parental labour income above (respectively below) average, it will be higher (respectively lower) than one. Because a rather large proportion of our sample does not report any labour income, we also include a dummy variable indicating this as an additional control variable. As the labour income of the parents might not be the main source of income of the

household, we also include a set of dummy variables indicating where the major part of household income comes from (farm ownership or farm use, self-employment, pension and unemployment benefits or other non-earning sources). Income stemming from employment constitutes the reference category (see Figures A2 and A3 in the Appendix for an illustration of these variables).

In order to better assess the impact of parental unemployment on the educational prospects of the child, we include a dummy variable indicating whether either of the parents is currently unemployed. Better indicators of the family's financial background at the time when the decision on the child's education was being made would probably be the incidence or duration of past unemployment spells of the parents. Unfortunately, this information was not gathered in the LFS in the years 1997 to 2000, so that we have to draw on the incidence of current unemployment assuming that current and past unemployment are strongly correlated.

Parents' education is represented by the highest educational level attained by the parents, i.e., we consider the education level of that parent holding the highest degree, defined in four levels according to the same ranking as described in Table 1 (see illustration of Figure A4 in the Appendix). The reference group consists of children whose parents completed at most primary education in relation to which the coefficient estimates are to be interpreted. The number of children up to age 15 in the household is also included in the regression as an indicator of family structure.

As far as individual characteristics are concerned, a dummy variable for sex is meant to assess the nature and the extent of differences in educational opportunities for men and women (see Figure A5 in the Appendix). Another dummy variable controls for the fact that disability might reduce educational prospects. We add information on city size as there is a strong and positive relationship between the number of inhabitants of the city of residence and the level of educational attainment at the bivariate level (see Figure A6 in the Appendix). In the estimation equation, people living in rural areas form the reference category. Furthermore we consider the impact of the region of residence. We distinguish 16 provinces that approximately equal the new Polish voivodships after the territorial reform in 1999.<sup>8</sup> Thus, we include 15 region dummy variables to check whether children living in certain parts of the country are advantaged or disadvantaged compared to the reference category of those residing in the Slaskie voivodship in the South of the country.<sup>9</sup> Finally, year dummies have been included in order to capture the extent of educational expansion over time.

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<sup>8</sup> New voivodship information is only given in the 2000 wave of the PLFS. For the preceding years we aggregate all of the previous 49 voivodships to have a comparable measure. However, as the new provinces are based on counties (*powiaty*) instead of old voivodships we cannot always ensure a 100 percent equivalence.

<sup>9</sup> In sensitivity analyses we tried other regional differentiations, namely the nine macro regions used by the World Bank and a classification of Polish regions into groups of different regional structure according to the methodology proposed by Scarpetta and Huber (1995). Qualitatively, the results hardly vary between classifications.

### 4.3 Estimation results

Table 2 presents the estimation results of the ordered probit model of educational attainment. As can be seen, parents' labour income has a statistically significant and positive impact on children's education, but the effect is small in magnitude. Note that those children living in households with no parental labour income have reached an even better education level than the reference group of low wage-earners. This might be due to the fact that those households without parental labour income receive income from other sources, such that they are not necessarily worse off. However, the main source of household income does not seem to have a significant impact on children's educational prospects when other factors are controlled for. One exception is children of self-employed parents who face significantly better educational prospects than children of employed parents. Note that sons and daughters of households drawing their main income from farm ownership or farm use do not seem to be significantly affected when other factors are controlled for (in particular city size might be more determining, as well as parental education etc.), even though the effect might be indirectly captured by the variable on parents' labour income, which is lower for agricultural households.

The same is true for children of pensioner households and of unemployed households. The latter effect is also partly covered by the dummy variable representing whether either of the parents is currently unemployed. This variable proves to have a negative impact on children's education.

Overall, parental wealth as measured by labour income, source of income and unemployment appears to have only a weak effect on children's education. Parents experiencing unemployment or having a poor income are often poorly educated as well and this is what seems to matter more. As a matter of fact, the effect of parental education is very significant and much larger in magnitude than that of the income or employment variables. Children of parents with primary education at most (the reference group) face the worst educational prospects, while those with higher education degree parents have by far the best educational prospects.

The estimation results reveal that the other control variables play an important role too. In the transition generation, women do significantly better than men in terms of educational attainment, everything else being kept constant. Being a female is positively related to one's education level at age 21, which is true at a significance level of 1 percent. These differences may partly be due to the types of occupations young women and men choose, as most of the male-dominated jobs require only basic vocational training whereas female-dominated occupations are typically preceded by general secondary education. Besides, the probability of reaching a higher schooling level decreases significantly if the person has a disability and with the number of children in the family. Thus, the negative impact of a large number of children often mentioned in the literature is found to be remarkably significant.

Local conditions also matter a lot. Even if other characteristics are controlled for, education is positively related to city size as the education level of 21 year-olds

**Table 2. Ordered probit estimation (Dependent variable: Highest degree obtained)**

Explanatory variables	Coeff. estimate	Standard error
Parents' labour income (deviation from yearly mean)	0.124**	0.050
Parents have no labour income	0.132**	0.065
Main source of household income (ref.: employment)		
Farm ownership or farm use	-0.092	0.069
Self-employment	0.236***	0.073
Pension	-0.044	0.054
Unemployment benefits	-0.152	0.116
At least one parent unemployed	-0.180***	0.063
Highest education of parents (ref.: primary education)		
Basic vocational education	0.270***	0.046
Secondary education	0.766***	0.049
Higher education	1.439***	0.084
Female (ref.: male)	0.500***	0.035
Number of children under 15 in the household	-0.084***	0.023
Disabled (ref.: not disabled)	-1.208***	0.108
City size (ref.: rural area)		
<20,000 inhabitants	0.188***	0.058
20,000-100,000 inhabitants	0.216***	0.050
>100,000 inhabitants	0.310***	0.049
Region (ref.: Slaskie)		
Zachodniopomorskie	-0.385***	0.093
Pomorskie	-0.163*	0.088
Warminsko-mazurskie	-0.187*	0.098
Podlaskie	-0.198*	0.114
Lubuskie	-0.326***	0.100
Wielkopolskie	-0.118	0.075
Kujawsko-pomorskie	-0.117	0.083
Mazowieckie	-0.127*	0.069
Dolnoslaskie	-0.253***	0.079
Lodzkie	-0.258***	0.080
Lubelskie	-0.019	0.086
Opolskie	-0.229**	0.108
Swietokrzyskie	0.017	0.092
Malopolskie	-0.139*	0.079
Podkarpackie	-0.152	0.095
Year of observation (ref.: 1993)		
1994	0.038	0.072
1995	-0.038	0.080
1996	0.044	0.071

**Table 2. (cont) Ordered probit estimation (Dependent variable: Highest degree obtained)**

Explanatory variables	Coeff. estimate	Standard error
1997	0.205***	0.070
1998	0.207***	0.070
1999	0.196***	0.070
2000	0.267***	0.074
Threshold values: $\mu_1$	-0.740***	0.010
$\mu_2$	0.559***	0.096
$\mu_3$	1.656***	0.098
Log likelihood		-4737.73
Pseudo R <sup>2</sup>		0.115
Sample size		4136

*Note:* Levels of statistical significance are \* 10 percent, \*\* 5 percent and \*\*\* 1 percent.

*Source:* Own calculations based on data from the PLFS, waves 1993–2000.

is worst in rural areas and is best in cities with more than 100,000 inhabitants. This picture is most likely due to the supply of educational institutions which depends on city size. Universities are more often located in larger cities, whereas rural areas are not so well endowed in terms of public education institutions.

In addition to this, remarkable disparities exist between regions. The estimation results provide a kind of synthetic indicator which enables us to rank the regions in terms of educational attainment. This ordinal ranking is illustrated through the shading of the Polish voivodships in the map of Figure 3. The Slaskie voivodship chosen as the reference region is the best-performing in terms of the educational attainment of its youth, since all other significant regional dummy estimates exhibit a negative sign. However, five regions do not differ significantly from the Slaskie region (Wielkopolskie, Kujawsko-Pomorskie, Lubelskie, Swietokrzyskie, Podkarpackie). The region which has the lowest educational attainment of 21 year-olds seems to be the Zachodnio-Pomorskie voivodship, followed by Lodzkie, Dolnoslaskie and Lubuskie, most of them being located in the Western part of the country. One explanation for the bad educational prospects, *ceteris paribus*, of children living in the West as opposed to the East might be the poor provision of public schools in these voivodships. Overall, there does not seem to be a strong link between our regional coefficient estimates and the picture drawn by the regional poverty rates of the World Bank reports (1994, 1995). Only the capital city region seems to combine low poverty with a relatively large proportion of high level education.<sup>10</sup>

<sup>10</sup> To some extent, these results may be driven by our selection of young Poles who are still living with their parents. However, this selection is necessary in order to have information on important family background variables.

**Figure 3. Education level by voivodship, conditional on individual characteristics**



*Note:* The lighter the shading, the higher the educational level of 21 year-olds in that region, given the socio-economic characteristics listed in Table 2.

*Source:* Own calculations based on data from the PLFS, waves 1993–2000.

The year dummies show an effect only for the later transition period, from 1997 onwards. The positive signs of the coefficient estimates for 1997 and later years once again underline the pattern of educational expansion in Poland, with notable jumps in 1997 and 2000.

## 5. Conclusion

Altogether, the transition period in Poland has been accompanied by a deepening of social inequalities and a rise in unemployment. If parental income and unemployment affected the educational prospects of the children significantly, social inequalities would be likely to get passed on over generations since education is

an essential determinant of social status. Thus, the transition to a market economy would have repercussions far beyond the transition itself.

However, the main finding of our analysis is that, when controlling for other characteristics, parental wealth as measured by parents' labour income, unemployment and the household's main source of income is only weakly related to the educational attainment of children in Poland. By contrast, the results suggest that parents' education matters more than their financial resources. Thus, the correlation between financial means and children's education observed at the bivariate level would be largely explained by the fact that parents' income and socio-economic status is strongly correlated with parents' education. Naturally, the question arises whether the parent's labour income and unemployment variables represent a reasonably good approximation of the household's wealth status. There might be other unobserved factors such as ability that drive the correlation. However, if one believes that ability is largely inherited from the parents, as theory suggests, and that parents' education is a good proxy for their learning ability, then it should also provide a reasonably good indicator of children's learning ability. If parental education is the essential variable determining children's educational outcomes rather than the financial situation of the household, the disruption caused by transition will not affect the education of children as much as one might have assumed.

A further essential finding of our study is that there exist particularly large spatial disparities in Poland. First, if children from farming families seem to be educationally disadvantaged in Poland, as often stated in the literature, this is not so much for financial reasons but more because they are living in a rural area. Indeed, the population size of the place of residence exerts a particularly strong influence on educational achievement. The larger the city, the better the educational level. Moreover, there exist strong disparities across regions. The Southern provinces of the country (Slaskie and voivodships to the East) as well as Wielkopolskie and Kujawsko-Pomorskie are those with the best educational prospects whereas the region from Zachodnio-Pomorskie to Dolnoslaskie (in the North-West) and Lodzkie cover the provinces with the worst educational prospects. This is true even after controlling for other factors such as the number of children or unemployment of the parents. Moreover, we know from analyses of income inequality that the most deprived families are those living in rural areas, with a large number of children and unemployed members (see e.g., Golinowska, 1997; Okrasa, 1999a and 1999b) – characteristics which our estimation revealed to affect educational prospects negatively. Thus, children growing up in rural areas seem to cumulate unfavourable characteristics with regard to their educational prospects. The true regional or local effect simply adds to other unfavourable social characteristics.

Our analysis provides first insights into the social factors related to the educational success of the young Polish generation. What precisely drives the strong differences in educational attainment across regions and cities, and by which mechanisms, seems to deserve further investigation.

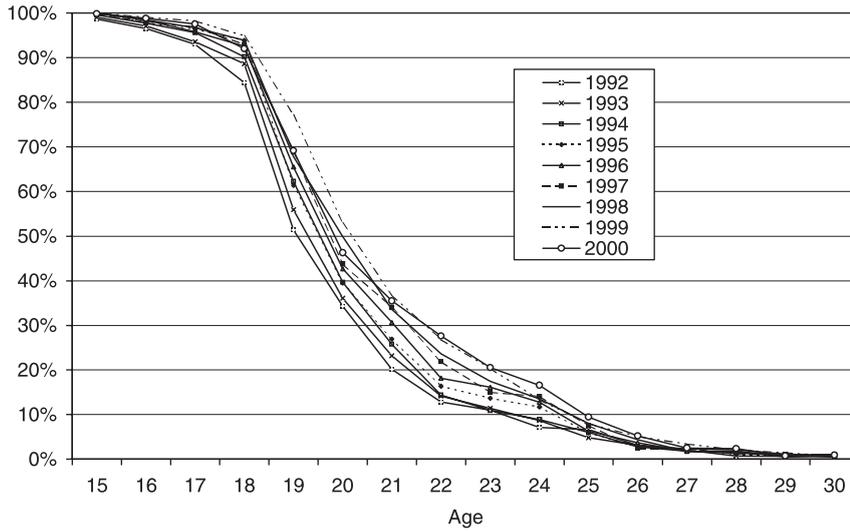
## References

- Beblo, M., Golinowska, S., Lauer, C., Pietka, K. and Sowa, A. (ed.) (2002). *Poverty in Poland – Selected Empirical Analyses*, CASE publication series, Warsaw.
- Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, National Bureau of Economic Research, New York: Columbia University Press.
- Becker, G. S. and Tomes, N. (1986). 'Human capital and the rise and fall of families', *Journal of Labor Economics*, 4, pp. 1–39.
- Boggess, S. (1998). 'Family structure, economic status, and educational attainment', *Journal of Population Economics*, 11(2), pp. 205–22.
- Boudon, R. (1974). *Education, Opportunity and Social Inequality*, New York: Wiley.
- Cameron, S. V. and Heckman, J. J. (1998). 'Life cycle schooling and dynamic selection bias: Models and evidence for five cohorts of American males', *Journal of Political Economy*, 106(2), pp. 262–333.
- Ermisch, J. F. and Francesconi, M. (2001). 'Family matters: Impacts of family background on educational attainments', *Economica*, 68, pp. 137–56.
- Eurydice (1999). 'Structures of education, initial training and adult education systems in Europe', *Eurydice*, Warsaw, pp. 1–35.
- Golinowska, S. (1997). *Polska Bieda. Kryteria. Ocena. Przeciwdziałanie. (Polish Poverty. Criteria. Evaluation. Counteracting Measures)*, Warsaw: IpiSS.
- Golinowska, S. (1998). 'Armut in Polen', in Voges, W. and Kazepov, Y. (eds.), *Armut in Europa*, Wiesbaden: Chmielorz.
- Haveman, R. and Wolfe, B. (1995). 'The determinants of children's attainments: A review of methods and findings', *Journal of Economic Literature*, 33(4), pp. 1829–78.
- Heyns, B. and Bialecki, I. (1993). 'Educational inequalities in postwar Poland', in Shavit, Y. and Blossfeld, H.-P. (eds.), *Persistent Inequality*, Boulder: Westview Press.
- Hill, M. and Duncan, G. (1987). 'Parental family income and the socioeconomic attainment of children', *Social Sciences Resources*, 16, pp. 37–73.
- Keane, M. and Prasad, E. (2002). 'Inequality, transfers and growth: New evidence from the economic transition in Poland', *IZA Discussion Paper No. 448*, Institute for the Study of Labor, Bonn, <http://www.iza.org>, <ftp://ftp.iza.org/dps/dp448.pdf>.
- Kotowska, I. E. (1997). 'Reducing income by income support in Poland. Some results of the household panel based study', mimeo, Warsaw School of Economics.
- Kotowska, I. E. (1998). 'Living conditions of blue collar households – A threat of poverty', mimeo, Warsaw School of Economics.
- Maddala, G. S. (1983). *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge: Cambridge University Press.
- Mare, R. D. (1980). 'Social background and school continuation decisions', *Journal of American Statistical Association*, 75(370), pp. 295–305.
- Mincer, J. (1974). *Schooling, Experience and Earnings*, New York: National Bureau of Economic Research.
- Okrasa, W. (1999a). 'The dynamics of poverty and the effectiveness of Poland's safety net (1993–96)', *Policy Research Working Paper No. 2221*, World Bank, Development Research Group, Poverty and Human Resources, Washington D.C., <http://econ.worldbank.org>, <http://econ.worldbank.org/docs/948.pdf>.

- Okrasa, W. (1999b). 'Who avoids and who escapes from poverty during the transition: Evidence from Polish panel data 1993–1996', *Policy Research working paper No. 2218*, World Bank, Development Research Group, Poverty and Human Resources, Washington, D.C., <http://econ.worldbank.org>, <http://econ.worldbank.org/docs/945.pdf>.
- Rosenzweig, M. R. and Wolpin, K. I. (1993). 'Intergenerational support and the life-cycle incomes of young men and their parents: Human capital investments, coresidence and intergenerational financial transfers', *Journal of Labor Economics*, 11(1), pp. 84–112.
- Scarpetta, S. and Huber, P. (1995). 'Regional economic structures and unemployment in Central and Eastern Europe. An attempt to identify common patterns', in Scarpetta, S. and Wörgötter, A. (eds.), *The Regional Dimension of Unemployment in Transition Countries*, Paris: OECD-CCET.
- Shea, J. (2000). 'Does parents' money matter?' *Journal of Public Economics*, 77(2), pp. 55–184.
- Sibley, C. W. and Walsh, P. P. (2002). 'Earnings inequality and transition: A regional analysis of Poland', *IZA Discussion Paper No. 441*, Institute for the Study of Labor, Bonn, <http://www.iza.org>, <ftp://ftp.iza.org/dps/dp441.pdf>.
- Solon, G. (1992). 'Intergenerational income mobility in the United States', *American Economic Review*, 82, pp. 393–408.
- Szarkowski, A. and Witkowski, J. (1994). 'The Polish Labour Force Survey', *Statistics in Transition*, 1(4), pp. 467–83.
- Szulc, A. (1997). 'Poverty and equality in Poland in the 1990s', mimeo, Warsaw School of Economics.
- Taubmann, P. (1989). 'Role of parental income in educational attainment', *AEA Papers and Proceedings*, 79(2), pp. 57–61.
- United Nations (1998). *Human Development Report Poland 1998*, Geneva: UN.
- World Bank (1994). *Poverty in Poland*, Report No.1, Washington D.C.: World Bank.
- World Bank (1995). *Understanding Poverty in Poland*, Washington D.C.: World Bank.

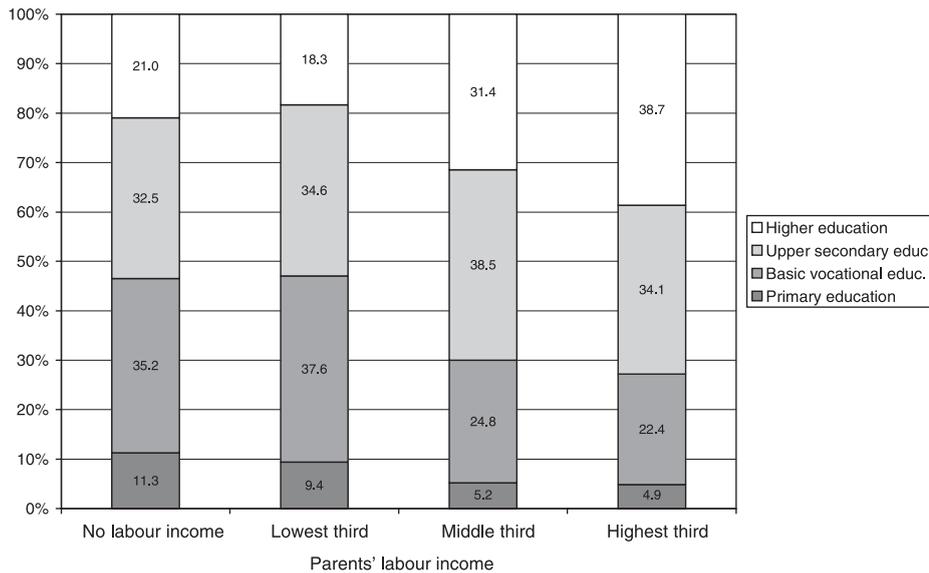
**Appendix**

**Figure A1. Enrolment rate of 15–30 year-olds over time**



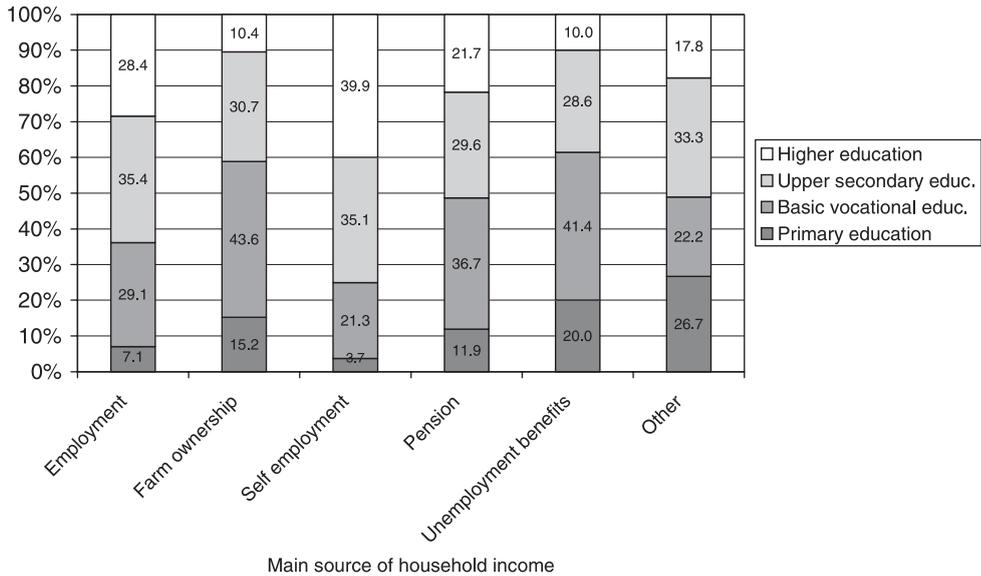
Source: Own calculations based on data from the PLFS, waves 1992–2000.

**Figure A2. Highest education level of 21 year-olds by parents' labour income**



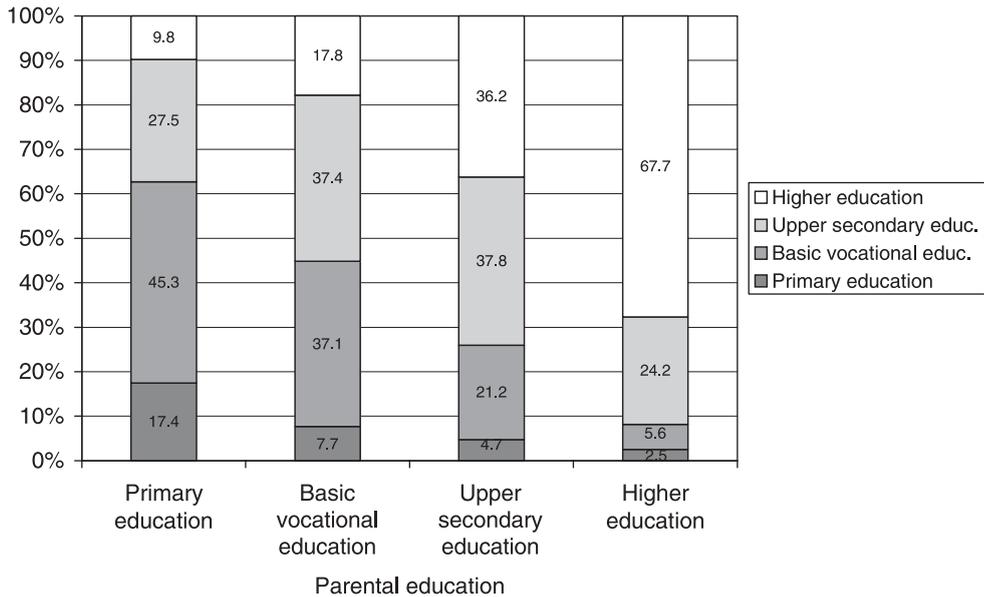
Source: Own calculations based on data from the PLFS, waves 1993–2000.

**Figure A3. Highest education level of 21 year-olds by main source of household income**



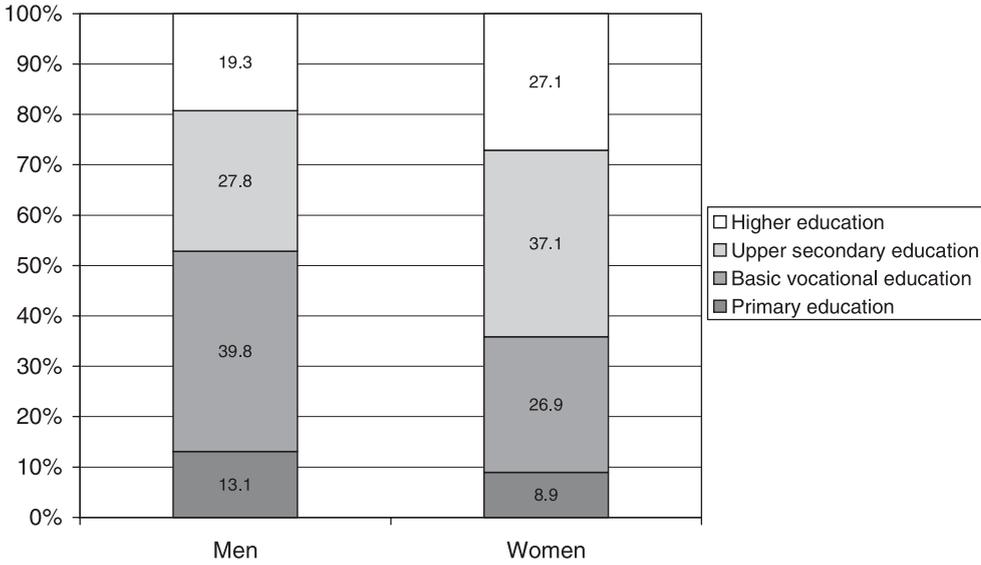
Source: Own calculations based on data from the PLFS, waves 1993–2000.

**Figure A4. Highest education level of 21 year-olds by parents' education**



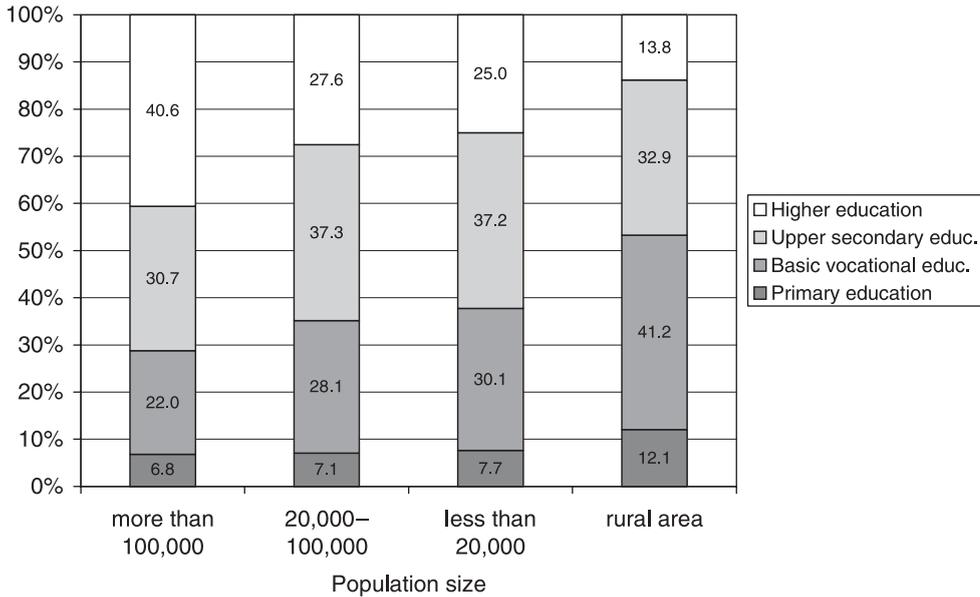
Source: Own calculations based on data from the PLFS, waves 1993–2000.

**Figure A5. Highest education level of 21 year-olds by sex**



Source: Own calculations based on data from the PLFS, waves 1993–2000.

**Figure A6. Highest education level of 21 year-olds by city size**



Source: Own calculations based on data from the PLFS, waves 1993–2000.

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