

## CHAPTER 11.

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# SKILLS, INEQUALITIES, AND OVEREDUCATION: THE PERVERSE EFFECTS OF EDUCATIONAL EXPANSION

## **Introduction**

The economic literature generally assumes that investment in education is the best way to avoid unemployment and increase earnings. This assumption is illustrated by numerous studies, comparing the rates of unemployment and salaries by level of education, in Poland as well as other countries (see, e.g., Domański 2009; UNDP 2007: 194). The results of public opinion polls, conducted in Poland over the last two decades, vividly demonstrate that a vast majority of citizens share this belief: according to a recent survey, in 2013 as much as 82 percent of the sample declared that it is worthwhile to acquire an education; throughout the last decade the respective percentage was even higher, around 90 percent (CBOS 2013a). Despite a fall in recent years, a majority of respondents still claim that education protects against poverty and unemployment (64 and 57 percent, respectively). Most striking, however, is the increase in educational aspirations of parents towards their children throughout the past twenty years, from 64 percent desiring a university diploma for their son or daughter in the early 1990s to 86 percent in 2009 and 2013. At the same time, the percentage declaring they would like their child to have a secondary education decreased by 15 points (CBOS 2013a; see also Kozłowski and Matczak 2014). Although parents' educational aspirations are still correlated with their own level of education, the increase in the

percentage of those who declare that they would like their children to attain a higher education was the most pronounced in rural areas and among people with a vocational education (an increase of almost 30 percentage points between 1993 and 2009). In light of these results, it seems obvious that the importance of a university degree in the labor market is now realized by nearly everyone, regardless of their level of education or place of residence (CBOS 2009).

This common view of education (especially at the tertiary level) as an entry ticket to better jobs and higher wages was the main driver of the massive educational expansion that occurred in Poland over the last twenty years. Although a similar trend has been observed in other industrialized countries (see McGuinness 2006), Poland stands out with regard to the magnitude of this change. At the end of 2014, 23.7 percent of the population aged 15 and above had a university degree, compared to only 6.5 percent in 1988 (GUS [Central Statistical Office] 2010, 2015a). The gross enrollment ratio for higher education, which in the academic year 1990/91 was less than 13, increased rapidly over the following fifteen years and stabilized at around 50 in the last decade (GUS 2014).

The consequences of this “educational boom,” in Poland and other countries, have become subjects of controversy among scholars and policymakers. It is often assumed that the occupational structure may to some extent adapt to the increased level of human capital in a given society. Specifically, changes in the educational structure may spur economic and technological development which, in the long run, leads to an increase in the share of jobs with higher skill requirements (see, e.g., Sloane 2003). However, questions were raised regarding the extent to which the latter change will be able to keep up with the rapid increase in the supply of highly skilled workers, especially in the short run. Contrary to what had been taken for granted by the proponents of the human capital theory, a larger number of people with a university degree need not result in higher productivity and higher wages, but may spur the phenomenon of overeducation. This term refers to a situation in which highly educated graduates, unable to find jobs which match their qualifications, are pushed into jobs with lower skill requirements (Smith 1986: 85–86; Thurow 1972). Attention was first brought to this issue as early as the 1970s in the United States, in the context of a massive “college boom” similar to the one which has taken place in Poland. According to a literature review published several years ago (McGuinness 2006), currently this problem affects a significant group of employees. The percentage

of overeducated workers found in various studies ranged from 7 to 57 in different countries; the most common estimate was in the range of 20–30 percent. Poland is no exception in this regard: analyses of Polish survey data suggest that the prevalence of overeducation increased systematically in the period 1988–2003, and is now substantial (Slomczynski and Krauze 2003; Kiersztyn 2013).

The aim of this chapter is twofold. First, to identify the correlates of educational mismatches on the Polish labor market and second, to assess the persistence of overeducation over time. Both issues are essential for an understanding of the mechanisms which underlie this phenomenon, as well as its socio-economic consequences. For example, even a significant percentage of highly educated workers in low-skill occupations may not be a problem if such mismatches are temporary, and ultimately lead to more adequate employment. However, large numbers of highly educated workers trapped in jobs with low educational requirements over longer periods of time would imply that individuals and societies overinvest in schooling (Borghans and de Grip 2000). In the latter case, the negative individual and social consequences of overeducation also become reasons for concern. Working below one's skill level was shown to have a negative impact on productivity and job satisfaction (Burriss 1983; Peiro, Agut, and Grau 2010; Tsang, Rumberger, and Levin 1991). Longitudinal studies of the psychological consequences of underemployment suggest that overqualification among recent high school graduates tends to increase the likelihood of depression even after controlling for earlier levels of psychological well-being (Dooley, Prause, and Haw-Rowbottom 2000; Friedland and Price 2003; O'Brien and Feather 1990). However, it should also be noted that even in the long run, the existence of a group of individuals whose jobs do not match their educational credentials does not necessarily imply that the labor market is inefficient in allocating people to occupational positions – it may also mean that college diplomas do not adequately reflect the actual skill level of workers (Bauer 2002; Büchel and Pollmann-Schult 2004; Chevalier 2003).

This chapter is organized as follows: section 2 presents the theoretical context of the debate concerning the mechanisms which foster occupational mismatches<sup>1</sup> and describes the hypotheses of the present study,

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<sup>1</sup> The concept of “occupational mismatch” is sometimes used in a wider sense and may also denote situations when workers are in occupations outside their field of specialization. Since these problems are beyond the scope of my study, in this paper

section 3 describes the data and methodology used to test the hypotheses, sections 4 and 5 present the results, and section 6 concludes.

## **Why Overeducation? Theoretical Considerations**

The labor market literature offers several competing theoretical explanations for the inequality of rewards received by different groups of workers. Different theories imply a different understanding of the nature and sources of overeducation, and lead to opposing predictions concerning the persistence of this state among individual workers. These differences are reflected in the three hypotheses adopted in this study. The first hypothesis treats overeducation as a consequence of the incompatibility between the educational and occupational structure, which forces a certain group of highly-skilled workers to enter into and remain in low-skill jobs. In light of this hypothesis, overeducation can be regarded as a serious problem and a challenge for educational and labor market policy. The second hypothesis assumes that people voluntarily accept jobs for which they are overqualified, and views overeducation and skill mismatch as unproblematic, short-term phenomena. The third hypothesis assumes that the labor market correctly assigns people to jobs according to their skill levels, and overeducation results from the fact that people with the same educational credentials differ with respect to their actual skills.

### Hypothesis 1. Overeducation as driven by structural factors.

This hypothesis arises from the assumption that the job structure is generally unresponsive to changes in the supply of workers with varying levels of schooling. Under such conditions, educational expansion forces a growing number of university graduates to compete for a limited number of high skilled jobs (Sloane 2003; Tinbergen 1984). This reasoning is commonly associated with L. Thurow's job competition theory, developed in the 1970s. According to this theory, job-seekers queue for

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the term "mismatch" refers only to skill under-utilization, and the undereducated are included among those with an adequate match. (For research on the mismatch between field of education and occupation see: Nordin, Person, and Rooth 2010; Robst 2008).

better paying primary-sector positions, and are ranked by education level, which, under imperfect information, is treated by employers as a proxy for future job performance and trainability. When the educational attainment of workers increases, the returns to schooling fall as a larger number of graduates end up in occupations below their level of skills, while the least-educated are “crowded-out” into low wage jobs or out of the labor market altogether. However, despite lower returns, investment in education is not reduced, since it enables workers to keep their position in the labor queue, protecting them from unemployment (Thurow 1972). A similar mechanism is predicted by signaling theory, which assumes that individuals invest in education to demonstrate higher productivity to potential employers (Spence 1973). Analogous claims have been made in the Polish literature: it has been pointed out (for example, by Kabaj 2005) that the Polish labor market is unable to accommodate the growing number of college-educated workers.

This hypothesis sees overeducation as a structural phenomenon, arising from the limited availability of occupational positions with high skill requirements. It is associated with social inequality, as those most likely to lose in the competition for better jobs are graduates with characteristics perceived by employers as negative signals. For example, women are more likely to be overeducated, due to their weaker labor market position (Groot and Maassen van den Brink 2000). An additional factor which may worsen the prospects of female job-seekers is marriage. Some authors claim that in a majority of families, priority is given to the husband’s job, which determines the choice of place of residence. As a result, living with their husbands may severely limit the job opportunities available to women. Their choices are further limited by the fact they are often also expected to perform household duties and care for other family members, which encourages them to choose jobs in a convenient location rather than those which offer a good match with respect to skill requirements (Büchel and Van Ham 2003).

Similarly, unemployment experiences are likely to increase the risk of overeducation, by signaling lower productivity to employers. Indeed, it has generally been found that previous unemployment has long-lasting negative career consequences for workers (e.g., Luijkx and Wolbers 2009). In addition, individuals who have experienced unemployment may be more “desperate,” and ready to accept any job, even one which under-utilizes their skills. This may be the case especially in places characterized by higher unemployment and fewer job opportunities: small

villages, especially those located far from metropolitan areas and less economically developed regions. Due to limited spatial mobility (see Kiersztyn 2013), the chances of finding an appropriately matched job are mainly determined by the employment opportunities available in the local (regional) labor market (Büchel and Van Ham 2003).

Finally, schools and fields of study vary with respect to their reputation among employers. In Poland, the unprecedented growth in the demand for higher education was accommodated by a massive expansion of private-sector universities and tuition-based irregular and part-time studies in the public sector, offering mostly education in “popular and cheap-to-run” fields of study, such as economics, management and administration, pedagogy, sociology, and tourism. These market-driven programs were easily accessible, but often perceived as undemanding and poorly taught (OECD 2006: 106; 2016). Consequently, college degrees obtained through different modes of study, at different institutions and departments differ largely in terms of their signaling function and labor market opportunities they offer (Jelonek and Szklarczyk 2013). These heterogeneities tend to reflect existing social inequalities, as young people from more advantaged backgrounds are more likely to graduate from tuition-free programs at renowned public universities (see Kwiek 2013).

The job competition theory also assumes that specific occupational skills are acquired primarily through experience and on-the-job training. Consequently, each successive cohort of graduates entering the labor market faces increasing difficulties in finding a well-matched job, forced to compete for such jobs with older, equally educated but also more experienced workers. Further, workers who enter into low-level occupations have very limited chances of moving into more demanding positions, as they lack the opportunities to gain the necessary experience. Under such conditions, overeducation is likely to become a permanent state for individuals, especially in the younger cohorts. The view of undemanding jobs as traps may also become a self-fulfilling prophecy, as the over-qualified lose their motivation to search for better matched work (see Kiersztyn 2013). This state-dependence may be further strengthened by the mechanism of cognitive decline: when individuals are deprived of opportunities to apply their skills in the jobs they have, they may be less able to sustain their cognitive abilities than adequately matched workers. At the same time, the skills acquired during their education may become obsolete, leading to the deterioration of their human capital (de Grip,

Bosma, Willems, and van Boxtel 2008). Consequently, the longer individuals remain in jobs for which they are overqualified, the more difficult it may become for them to achieve upward mobility.<sup>2</sup>

Hypothesis 2. Overeducation as a temporary mismatch at the beginning of a working life.

The theories which suggest that overeducation is a temporary phenomenon are the matching model and career mobility hypothesis. According to the matching (or job shopping) model, individuals have imperfect information concerning the rewards and performance requirements associated with different jobs. They can only learn about those properties through experimentation: by accepting consecutive employment offers and quitting whenever they find their experience unsatisfactory. Thus, as time passes, workers who started out in suboptimal employment, are usually able to achieve a better job match (Johnson 1978; Jovanovic 1979; Viscusi 1980). The more recent career mobility hypothesis (Sicherman and Galor 1990) assumes that people voluntarily accept jobs for which they are overqualified in order to gain the experience, additional training, and social capital necessary for career development. Overeducation is usually a short-term mismatch at the beginning of a working life: as time passes, initially overeducated workers move on to more demanding positions, and the risk of overeducation is likely to decrease among workers with job-specific experience (Becker 1962; Sicherman 1990). From a policy perspective, it is also worth noting that both the matching and career mobility theories see skill mismatches as unproblematic: they are considered a normal feature of a well-functioning labor market.

Over the last years, there have been many publications attempting to assess the validity of the career mobility hypothesis, based on panel data (see Kiersztyn 2013, for a detailed review). Although there has been

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<sup>2</sup> Paradoxically, cognitive decline may be also viewed as a process adjusting (though downwards) the match between workers' abilities and the level of their jobs. Such a claim sheds light on the puzzling results of studies, which found that the overeducated tend to report increased skill requirements for their jobs, or a better job-education match (particularly when longer term changes are taken into account), even while they continue to perform the same job at the same firm (Groot and Maassen van den Brink 2003; Robst 1995a). Given the possibility of cognitive decline, we should not be overly optimistic about studies suggesting a long-run improvement of workers' subjective perceptions of the match between their skills and jobs.

some controversy surrounding these studies, there are some that found overqualified workers to be more likely to improve their labor market position after one or two years, compared to other workers (Dekker, de Grip, and Heijke 2002; Sichernan 1991). Overschooling has also been found to increase the likelihood of searching for other work and expressing the intention to quit (Groot and Maassen van den Brink 2003; Robst 1995a). All in all, this theory received rather limited support: upward mobility need not entail mobility out of overeducation, as shown in many studies relating overeducation to its lagged values (see Kiersztyn 2013).

### Hypothesis 3. Overeducation as resulting from skill heterogeneity.

According to human capital theory, workers' wages depend solely on their productivity, which in turn is determined by their formal education, experience and on-the-job training (Becker 1962; Schultz 1961). Skill under-utilization is difficult to explain by this model, since theoretically, in a properly functioning labor market, it should not occur (Borghans and de Grip 2000). However, human capital theory does offer an explanation of overeducation, different from the ones described above, though this is seldom stated explicitly in the literature. This explanation rests on the observation that overeducation need not imply skill mismatch. Formal educational credentials are only one of many factors, such as individual abilities, personality traits, professional experience, or school quality, determining the level of human capital (Green and McIntosh 2007). Thus, workers with the same level of education may differ substantially with respect to their actual productivity and skills (Bauer 2002; Büchel and Pollmann-Schult 2004; Chevalier 2003). Accordingly, individuals performing jobs which adequately match their skills may at the same time meet the definition of overeducation (Verhaest and van der Velden 2010). The conceptualization of overeducation as resulting from skill heterogeneity also implies that this is likely to be a long-lasting phenomenon, though not as a result of "true" state-dependence.

In numerous analyses of overeducation published throughout the last decades, there were many attempts to take into account unobserved worker heterogeneity with respect to human capital, as well as factors such as experience, college quality, field of study, and grades attained at school (e.g., Bauer 2002; Frenette 2004; Robst 1995b). In Poland, the relatively weak correlation between objective measures of overeducation and subjective evaluations of skill mismatch (Kiersztyn 2011) also



suggest that differences in human capital may be a promising explanation, though this finding may also be interpreted in terms of cognitive decline or psychological coping mechanisms. Another factor relevant in the Polish case is the ongoing hierarchical differentiation of the higher education system, occurring as a result of the “educational boom” of the last two decades. Specifically, there exists a divide between highly competitive, academically demanding tuition-free programs at major public universities, and much less demanding tuition-based studies, many of which can be completed by practically anyone who can afford to pay the required fees (Kwiek 2013). Under such conditions, it is likely that Polish higher education graduates differ largely in terms of skills depending on the university, field and mode of study.

The analyses presented below offer a test of the three hypotheses, based on the differences between the socio-economic correlates of overeducation predicted on the basis of each theoretical explanation. Hypothesis 1 leads me to expect overeducation to be more common among individuals with a weaker labor market position and in regions characterized by fewer employment opportunities. Conversely, negative correlations between past job mobility, length of tenure, and overeducation are arguments in favor of hypothesis 2. Finally, if overeducation is mostly determined by measures of cognitive ability, or the quality of schooling offered by various institutions, this would suggest the validity of hypothesis 3. A further test of the hypotheses is provided by longitudinal analyses of the persistence of overeducation: high levels of mobility out of overeducation offer support to hypothesis 2, while limited mobility is consistent with hypothesis 1 and/or 3.

## Methodology

Data for the analyses are taken from the Polish Panel Survey POLPAN, 1988–2013. The panel nature of the data enables a direct test of hypothesis 2. In this context, an important feature of POLPAN is that it is the only panel survey including detailed occupational history data covering the whole period of educational expansion in Poland. As such, it allows the analysis of changes in the incidence and persistence of overeducation at various stages of this expansion. In addition, starting from the 1998 wave, the panel sample has been supplemented by younger cohorts of respondents, enabling inter-cohort comparisons of successive labor market

entrants. With regard to the cross-sectional analysis, the most recent wave of the survey includes a measure of cognitive capacity (Raven test) and detailed information on the school completed. The availability of such indicators makes POLPAN one of the few available data sources allowing a direct test of hypothesis 3.

### ***Dependent Variable***

Occupational mismatch is defined as occurring among individuals who are in jobs with relatively low educational requirements scores given their level of schooling. Specifically, a respondent  $R$  is considered overeducated during a POLPAN wave  $n$  if the educational requirements score attributed to  $R$ 's main occupation is lower than one standard deviation below the mean for all respondents in  $R$ 's educational category in the first, 1988 POLPAN wave. I use the educational requirements scale for 3-digit-level Polish Social Classification of Occupations (SKZ) categories, developed in the early 1980s by Slomczynski (1983) and updated in 2004 (Slomczynski 2007). The values of this scale range from 6 for unskilled service workers to 89 for the highest level managerial and professional occupations. The threshold values of the educational requirements scores were calculated separately for three educational categories: high school graduates, respondents with post-secondary vocational or incomplete university education, and university graduates. The lowest value of educational requirements score with which a respondent's job is assumed to be adequately matched (the value obtained by subtracting the standard deviation from the mean requirement score) was 29.21 for respondents with secondary education, 43.30 for those with post-secondary vocational or incomplete university, and 60.75 for university graduates. I assumed there could be no overschooling among those with only elementary or basic vocational education.<sup>3</sup>

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<sup>3</sup>The overeducation measure used in this chapter differs from the ones commonly used in the literature, such as the job analyst, realized matches and subjective indicators (see Kiersztyn 2013, for a detailed description and related references). The choice of measurement is motivated by the fact that it allows to avoid the arbitrariness involved in converting the level of education into years of schooling, and years of schooling into specific educational requirements scores (see Kiersztyn 2013). In Poland, the choice of measurement does not appear to strongly affect the overall incidence of job mismatches. Additional analyses of POLPAN 2013 data found similar percentages of overeducated respondents using the subjective and realized matches

It is important to underline that the overeducation threshold values for all six panel waves were calculated on the basis of data gathered in 1988. Calculating the threshold values separately for each wave yields overeducation indicators which are based on the distribution of workers with different levels of education in various occupations at a given point in time, and therefore precludes the study of how shifts in the educational and occupational structures affect the risk of job mismatch. If, for example, a rapid growth in the number of college graduates raises the share of highly-educated individuals in jobs with low requirements, the overeducation threshold for such workers falls accordingly – so that relatively fewer workers are considered overeducated in the later periods. Using thresholds calculated separately for each wave could also lead to a situation in which many respondents appear to move out of (or into) overeducation, even while their actual level of education and occupation remain unchanged (see also Kiersztyn 2013).

The main analysis proceeds in two steps. First, I analyze the socio-economic distribution of overeducation in 2013 using logistic regression, on a sample of productive-aged working respondents with at least a secondary education (those with elementary education or lower vocational education are excluded, since they cannot be overeducated by definition). The analyses take into account three sets of variables, associated with each of the three hypotheses examined in this chapter. The data was weighted to correct for the overrepresentation of the respondents from the youngest age categories (21–25 and 26–30). Second, I use the panel dataset to analyze overeducation persistence by means of random-effects logistic regression models, relating overeducation to its lagged value. The unit of analysis is a respondent during the time of two consecutive waves of the panel study (henceforth,  $t_n$  and  $t_{n+1}$ , where  $n$  is the number of the first of the two waves). The models are estimated on an unbalanced sample of respondents aged 21 and above at  $t_n$  present in at least two successive waves of POLPAN, who were working for an income at both  $t_n$  and  $t_{n+1}$  and who have not reached retirement age (65 for men and 60 for women) at  $t_{n+1}$ . The model can be written as:

$$OED_{in}^* = X'_{in} \beta + \gamma OED_{in-1} + c_i + u_{in},$$

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methods. The indicator used in this analysis was found to be strongly correlated with the realized matches measure, based on the modal value of the educational variable (Pearson  $r = 0.79$ ,  $p = 0.000$ ,  $N = 1414$ ).

where  $i$  denotes the individual,  $n$  denotes the number of the POLPAN wave,  $OED_{in}$  is a binary variable which takes the value 1 for those who are overeducated and 0 for those who are well matched,  $X'_{in}$  is a vector of explanatory variables,  $c_i$  is an individual specific measure of unobserved heterogeneity, and  $u_{in}$  is an error term.

### ***Independent Variables for the Cross-Sectional Analyses***

The first group of independent variables are characteristics which, according to hypothesis 1, may limit individuals' access to adequate employment. These include: gender (with men as the reference category), coupled with a variable identifying women living with their husband or partner, and a dummy indicator informing whether or not the respondent experienced at least one spell of joblessness lasting for at least three months within three years prior to the survey. The analysis also takes into account various characteristics of the respondents' place of residence, which affect the local labor market opportunities available to inhabitants. The first is a dummy variable distinguishing between rural and urban areas. However, since the latter indicator may not capture the differences between isolated villages and rural areas from which people can commute to work in a nearby city, I also include a nonmetropolitan residence variable in the analysis. Nonmetropolitan residence is operationalized as living in rural areas in regions where there are no cities or clusters of cities with a total population of at least 500,000; each of the 49 voivodeships according to the pre-1999 administrative division of Poland is treated as a separate region<sup>4</sup> (all other respondents are the reference category). Another regional variable identifies the individuals who live in the least developed, peripheral, Eastern voivodeships, according to the current administrative division (these include the following districts: *Warmińsko-Mazurskie*, *Podlaskie*, *Lubelskie*, *Świętokrzyskie*, *Podkarpackie*). Finally, an important indicator is unemployment in the respondents' commune or municipality (*gmina* – the smallest administrative unit in Poland). This is the number of registered unemployed divided by the number of productive-aged residents, calculated on the basis of

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<sup>4</sup> In Poland, there are only six urban centers large enough to meet this condition (Warsaw, Lodz, Poznan, Krakow, Wrocław, the Gdansk and Katowice agglomerations). I assume that the metropolitan influence zones of these cities are roughly equal to the territory of the former voivodeships where they are located.

GUS (Central Statistical Office) data. These unemployment rates were calculated for two successive years, 2012 and 2013, the average of the two values was used in the analysis.

A second group of variables, related to Hypothesis 2, characterizes the employment histories of the respondents. To capture job mobility, I use a variable identifying respondents who have not changed jobs since January 1<sup>st</sup>, 2008 (such changes also include moving into a new position with the same employer). A separate variable identifies respondents who recently entered or re-entered the labor market and remained in their initial jobs in 2013: entry-level jobs are defined as those that were started less than three years before the survey, and were not preceded by any employment since January 1<sup>st</sup>, 2008. I also include years of tenure with the current employer (this is not to be mistaken with tenure at the current job position).

The third group of independent variables attempts to capture differences in human capital which are not reflected by the formal level of education. Cognitive capacity is measured using the results of a ten-item Raven test completed by each respondent.<sup>5</sup> In addition, the analysis includes several variables serving as proxies for the type and quality of schooling offered by various educational institutions. The first divides the respondents into three categories: those who completed higher education (with at least a bachelor's degree) and graduated from one of 35 best universities in Poland; other tertiary graduates; and secondary and post-secondary graduates (the reference category). The best universities are identified on the basis of a highly publicized, annual academic school ranking.<sup>6</sup> The second variable taps the field of study completed by each respondent, also among secondary graduates: technical and life sciences,

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<sup>5</sup> Only respondents aged up to 30 completed the Raven test in the 2013 wave of POLPAN. For respondents aged 31 and above, I use the results of an analogous test completed in the earlier, 2008 wave.

<sup>6</sup> I used the Perspektywy University Ranking (Poland) published by the Perspektywy Education Foundation since 2000, which takes into account the following items: prestige, academic effectiveness, academic potential, teaching and learning, innovativeness, and internationalization. See [www.ranking.perspektywy.org/2015/ranking-uczelnia-akademickich/metodologia-rankingu-akademickich-szkol-wyzszych](http://www.ranking.perspektywy.org/2015/ranking-uczelnia-akademickich/metodologia-rankingu-akademickich-szkol-wyzszych) for a detailed methodological description and detailed list of indicators. This is the most credible ranking of academic institutions in Poland, and one of the few rankings which passed the IREG Ranking Audit and received IREG Approved certificate ([ireg-observatory.org](http://ireg-observatory.org)).

specializations commonly considered to be more desirable among employers, as opposed to general studies or studies in the social sciences and humanities (the reference category).

Finally, the models control for age category, a variable identifying the youngest respondents, aged 21–25 and 26–30 at the time of the study; respondents aged over 30 are the reference category. A separate dummy variable, educational status, distinguishes individuals aged 21–29 who were still in education at the time of the survey, from all other respondents.

### *Control Variables for the Panel Analyses*

The main aim of the panel analyses is to assess the persistence in overeducation, controlling for other factors which are likely to influence the likelihood of skill mismatches at  $t_n$ . With respect to the choice of control variables, I follow my earlier analyses of POLPAN 1988–2008 data (Kiersztyn 2013). All the models control for: gender (men are the reference category), age, birth cohort, tenure with the current employer, and the local labor market conditions. The age category variable identifies the youngest (aged 21–25, 26–30, and 31–35 at  $t_n$ ) and oldest (aged 40–44, 45–49, and 50–59 at  $t_n$ ) groups of respondents. 36–39-year-olds are the reference category.<sup>7</sup> The cohort variable identifies respondents born in the years: 1963–1967, 1986–1972, 1973–77, 1978–1982, and 1983–1987 (the youngest cohorts, aged 21–25 in the first, second, third, fourth, and fifth wave of the panel, respectively). The remaining respondents (born in the years 1928–1962) are the reference category. It should be noted that while the age category variable may have different values for the same respondent (depending on the year of the POLPAN wave), birth cohort remains unchanged for each panel participant. Tenure with the current employer at  $t_{n+1}$  is measured in years. The regional unemployment rate at  $t_{n+1}$  is the number of registered unemployed per 100 productive age population in the respondents' province (voivodeship) of residence. This variable is based on the former, pre-1999 administrative division of Poland into 49 voivodeships.

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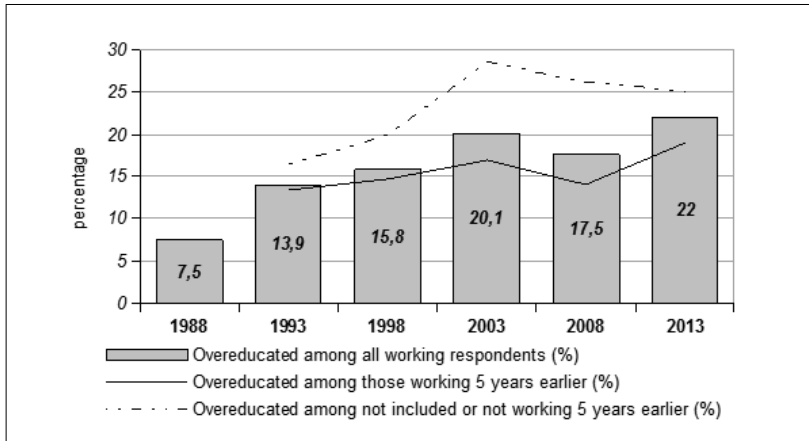
<sup>7</sup> It should be noted that although respondents aged 21–25 were not included in the 1993 wave of POLPAN, on the basis of the employment history and educational variables from the 1998 survey it was possible to assess whether respondents aged 26–30 in 1998 were overeducated five years earlier.

To control for differences in the economic context of the consecutive five-year intervals, I use a dummy variable identifying the year of each POLPAN wave (at  $t_{n+1}$ ). To account for the possibility that observed trends in the incidence of occupational mismatches may largely be a result of changes in the shares of respondents who, by definition, are eligible to be included among the overeducated, I also control for individual educational attainment. The variable education at  $t_n$  groups the respondents into two broad categories: high school (together with post-secondary vocational) graduates, university graduates. Those with elementary or basic vocational education are excluded from the regression analyses. Finally, to control for the heterogeneity of the actual skill requirements among the self-employed in the Polish context (see Kiersztyn 2013), in some models I also include an additional occupational category variable. It is based on one-digit SKZ codes, and identifies respondents who were independent farmers (farm owners) or proprietors at  $t_n$ . The remaining occupations are the reference category.

## Cross-Sectional Results

Data on the overall incidence of overeducation, presented in Figure 11.1, follow an upward trend during the first fifteen years of the transition. The total percentage of overeducated workers grew faster during periods of economic slowdown. 1988–1993 were the first years of the post-communist transition, marked by economic instability, the collapse of many state-owned companies, the appearance and fast rise of joblessness. The unemployment rate also grew between 1998 and 2003: by 2002, it reached a record value of 20 percent. In the period 2008–2013, the Polish labor market was affected by the global economic crisis (EUROSTAT 1997–2015; GUS 1990–2016). Accordingly, the overall percentage of overeducated workers in each period increased by 6.4, 4.3, and 4.5 percentage points, respectively. In 1993–1998, when the economic situation improved, the incidence of overeducation increased by only 1.9 percentage points, and in the most prosperous years following EU accession, 2003–2008, it even fell by 0.7 percentage point. This counter-cyclicality can be explained by a “skill-bumping” mechanism, consistent with the job competition theory: during economic downturn, when work is less available, higher educated individuals take the jobs previously performed by workers with less schooling, while the latter are crowded out

into unemployment or inactivity (Dolado, Felgueroso, and Jimeno 2000; Muysken and Ter Weel 2000; Verhaest and van der Velden 2010).



**Figure 11.1.** Overeducation in 1988–2013

*Notes:* For the calculation of the overeducation rate in the total population, respondents who did not participate or were not working in other POLPAN waves are taken into account (sample sizes in the consecutive waves are: 4426, 1501, 1144, 825, 999, and 1329). Data for 2008 and 2013 are weighted to correct for the overrepresentation of the youngest respondents. For the calculation of overeducation rates by previous survey and labor market status, the sample sizes in the consecutive waves are: 1294, 903, 597, 510, and 565.

It appears, however, that after 1993, this process concerned mostly people entering or reentering the labor market. The incidence of overeducation among POLPAN respondents who were also working during the preceding wave grew rather modestly in the years 1998–2003 (by only 2.2 percentage points), while overschooling among new panel participants (aged 21–25) and respondents who were unemployed or inactive five years earlier increased by 8.6 percentage points (dashed line in Figure 11.1). It should also be noted that in 2013, due to a change in survey methodology (for the first time panel respondents who dropped out from the preceding wave were also tracked), some of the respondents who did not participate in the 2008 were neither members of the youngest cohort, nor jobless five years before. This could explain the fall in the incidence of overeducation between 2008 and 2013, indicated by the dashed line. If we exclude from the subsample of POLPAN 2013



respondents who were not present or not working in the preceding wave those who reentered the survey, the percentage overeducated increases to 32.2. In other words, when the data is comparable, we can see that over the last years, the incidence of overschooling among people entering or re-entering the labor market grew faster than among other respondents (by 6 percentage points).

We now turn to the multivariate results for 2013, which are reported in Table 11.1. Since many of the independent variables were strongly intercorrelated, they were included in the models interchangeably to avoid collinearity issues. However, the main results were robust with respect to model specification. They were also unaffected by the high number of missing data with respect to the Raven test (as reflected in the smaller sample size in model 2, compared to model 1).

In general, the explanatory power of the models was rather weak, and many of the predictors were found to be insignificantly related to the dependent variable. Among the three hypotheses, the first appears to have received the strongest support. There is a clear relationship between previous unemployment experiences and the risk of overeducation, visible in both models. Despite not very high significance levels (which is due to the limited sample sizes), this relationship seems quite strong – experiencing at least one spell of joblessness lasting for a minimum of three months during the last three years increases the chances of occupational mismatch by approximately 20 percent. Consistent with hypothesis 1, the type of local environment is also related to overeducation to some extent – as reflected by the relationship between living in a rural nonmetropolitan area and the dependent variable. This finding suggests that there may be a link between poor local labor market opportunities and overeducation. However, neither the local unemployment rate, nor living in Eastern regions of Poland appears to have a direct effect the incidence of mismatches among the respondents. In addition, and contrary to expectations and research findings from other countries, being a woman, in particular a woman living with her husband, has no influence on overeducation. This null finding may be partially explained by the low spatial mobility of Polish workers, which makes situations in which the wives are forced to “follow their husbands” moving in search for better employment, relatively rare.

In light of hypothesis 2, short tenure at the firm (though not necessarily in a given occupational position) and being in an entry-level job are expected to increase the risk of overeducation, while job mobility

– reduce it. Only the first of these relationships was confirmed in the statistical analysis (model 2 in Table 11.1). The link between within-firm tenure and occupational mismatch explains the higher prevalence of overeducation among the youngest cohorts of respondents, aged 21–25 (model 1 in Table 11.1): when tenure is included in the equation, the age category variable becomes insignificant, and was dropped from the final model due to collinearity. The greater incidence of overeducation among young, inexperienced workers is consistent with the career mobility hypothesis, but it can also be explained by the job competition and human capital theories: lack of experience implies lower levels of human capital and productivity, and may be treated by employers as a negative signal, which lowers young job-seekers' chances for successful competition for high-skilled employment. Given the fact that, contrary to hypothesis 2, job mobility was not found to be negatively associated with overeducation, the latter interpretation seems more likely (see also Kiersztyn 2012). Resolving this issue requires panel analyses of mobility out of overeducation, which are reported in the next section.

The analyses offer mixed results with respect to hypothesis 3. The quality (actual or perceived by employers) of education appears to be an important safeguard against job mismatches, as reflected by the consistent and strong relationship between graduating from a prestigious university and overeducation. What is especially surprising is that tertiary education, by itself, seems to offer no significant gains in terms of protecting against mismatches relative to only completing high school. What counts is having a diploma from the “right” university, which, net of other variables, reduces the risk of overeducation by 13 to 15 percent. At the same time, other indicators associated with the human capital hypothesis were found to be insignificant. This includes the Raven test scores, but also the field of study. The latter finding is the most striking, as the recent public debate in Poland generally portrays studies in technical and life sciences as desirable among employers, as opposed to general studies or studies in social sciences and humanities, which have become more popular (due to the expansion of private-sector education) but are considered to offer fewer competitive advantages and are often associated with low quality education. However, the conclusion that the field of study may actually be less important than the university one attends, is consistent with another recent study analyzing the career prospects of young Polish graduates (Jelonek and Szklarczyk 2013)

**Table 11.1.** Coefficients of Logistic Regression Models Explaining the Likelihood of Overeducation in 2013, Including Standard Errors and Average Marginal Effects

	Model 1			Model 2		
	B	SE	AME	B	SE	AME
Female (ref.: male)	-0.163	0.247	-0.035	-0.082	0.269	-0.017
Age (ref.: 31 and more)						
Aged 21–25	0.532	0.259*	0.120			
Aged 26–30	0.238	0.202	0.052			
Experienced unemployment	10.030	0.403*	0.239	0.920	0.454*	0.209
Woman lives with husband	0.333	0.259	0.072	0.263	0.287	0.056
Local unemployment rate	0.022	0.029	0.005			
Rural area (ref.: urban)	0.245	0.196	0.054			
Rural nonmetropolitan area				0.485	0.227*	0.106
Eastern Poland	0.144	0.218	0.032	0.128	0.239	0.027
Entry-level job	-0.069	0.310	-0.015			
Years of tenure with employer				-0.032	0.017*	-0.007
First job since Jan.2008				-0.070	0.229	-0.015
Education (ref.: high school)						
Graduate of good university	-0.617	0.227**	-0.128	-0.736	0.262**	-0.151
Graduate of other university	0.145	0.224	0.034	-0.187	0.250	-0.042
Technical or life sciences specialization (ref.: other)	-0.295	0.194	-0.064	-0.303	0.232	-0.064
Raven test				0.039	0.062	0.008
Still in education	0.099	0.236	0.022	0.316	0.237	0.069
Constant	-0.865	0.336*		-0.559	0.462	
Log pseudolikelihood		-6230.712			-4200.060	
Wald chi <sup>2</sup>		390.740			360.130	
McFadden's R <sup>2</sup>		0.044			0.058	
N		873			650	

*Note:* The sample is restricted to respondents with high school or university education. Data are weighted to correct for the overrepresentation of the youngest respondents.

\*\*  $p < 0.01$ , \*  $p < 0.05$  (2-tailed)

## Results of Panel Analyses

The observation that young workers with short firm-level tenure are more likely to be in mismatched occupations at a given point in time does not allow the assessment of their situation and labor market prospects. If a given person is overeducated in a given moment, this may mean two different things: he/she is in the process of entering a firm and may soon move on to a more demanding position (as assumed in hypothesis 2), or he/she may be trapped in low-skilled employment (as predicted by hypotheses 1 and 3). Distinguishing between these two situations requires panel data on individual career trajectories. This section offers a direct test of the career mobility hypothesis by the examination of the transitions out of overeducation throughout the whole period of educational expansion in Poland.

To see whether, controlling for important worker characteristics and the economic context, having a job below one's qualifications is associated with analogous mismatches five years later, I use random-effects logistic regression models, estimated on a subsample of panel respondents restricted to those with at least high school education. The model coefficients are reported in Table 11.2. The age category variable was dropped from the models, since the simultaneous inclusion of respondents' age category and cohort membership in the regression equations caused collinearity problems. Although additional analyses found some weak positive correlations between belonging to certain age categories and the chances of overeducation at  $t_{n+5}$ , these results were neither robust nor easily interpretable. Including the age variable in the model had no effects on the results with respect to the effect of lagged overeducation.

The statistical results suggest that overeducation in Poland is characterized by a high degree of persistence. Those overeducated at  $t_n$  were almost seven times more likely to still be in that situation five years later, compared to other workers, even when the occupational control variable is included in the equation (model 4). These results are very similar to those from my earlier study of persistence in overeducation, based on POLPAN 1988–2008 data (Kiersztyn 2013). In addition, there are reasons to believe that skill mismatches on the Polish labor market are self-reinforcing, i.e., the relationship between overeducation and its lagged value can be explained by the scarring effect of job mismatches. In an earlier analysis of overeducation transitions based on POLPAN 1988–2008 data, I provide an additional sensitivity test, using the approach proposed by

Wooldridge (2005) to assess whether the regression results have been biased by the initial conditions problem and unobserved heterogeneity or non-random attrition (see Kiersztyn 2013, for a detailed description of these issues and the relevant references). The results of this analysis confirmed that the main findings with respect to the persistence of overeducation were not affected by endogeneity and are likely to reflect true state-dependence. Such an interpretation is consistent with hypothesis 1.

An additional illustration of overeducation persistence is provided by Table 11.3, which reports the percentages of overeducated respondents who remained in this state after five years separately for subsequent POLPAN waves. Throughout the whole period under study, a majority of those in jobs below their qualifications at  $t_n$  were in the same situation five years later (see Kiersztyn 2013 for more detailed results based on 1988–2008 data). The respective percentages ranged from 62 to even 68; this result remained mostly unchanged in the successive five year periods. Such figures seem quite high, especially given that five years can be assumed sufficiently long to allow many workers to find better matched jobs; this is a longer period than the one adopted in many studies of labor market transitions. The one period which stands out is 2003–2008, when the share of respondents staying in overeducation fell by 11 percentage points, compared to the preceding wave. The latter change may likely have been the result of migration out of Poland in search for better employment. The job competition model would lead us to expect that emigration lowers overeducation persistence among those who stay, due to the falling number of candidates for high-skill jobs. After Poland joined the EU in 2004 and foreign migration became more easy for people seeking to improve their labor market prospects, many young or dissatisfied workers decided to take advantage of this opportunity. This tendency is clearly visible in the POLPAN data: the young and those who were overeducated in 2003 were overrepresented among subsequent panel drop-outs (Kiersztyn 2013). As the global economic crisis made migration a less profitable option in the most recent period, 2008–2013, the percentage staying overeducated returned to its previous level.

Regardless of the view of overeducation as a trap, it should be noted that the total incidence of persistent mismatches, i.e., observed during two successive waves of the panel, remained rather low. This is illustrated by data from the second row of Table 11.3, reporting the percentage of persistently overeducated workers among in the panel sample for each successive transition period. Throughout the years of educational

**Table 11.2.** Coefficients of Random Effects Logistic Regression Models Explaining Determinants of Overeducation at  $t_{n+1}$ , 1988–2013

	Model 3			Model 4		
	B.	SE	Odds Ratio	B.	SE	Odds Ratio
Overeducation at $t_n$	2.384	0.146	10.844	1.926	0.146***	6.863
Gender (ref.: male)	-0.696	0.150***	0.480	-0.583	0.135***	0.558
$t_{n+1}$ year (ref.: 2013)						
1993	-0.126	0.285	0.881	0.018	0.270	1.018
1998	-0.205	0.279	0.815	-0.194	0.267	0.823
2003	0.166	0.290	10.181	0.167	0.278	10.182
2008	-0.137	0.280	0.872	-0.095	0.268	0.910
Birth cohort (ref.: born before 1963)						
1963–1967	0.220	0.279	10.247	0.038	0.255	10.039
1968–1972	-0.494	0.313	0.610	-0.365	0.281	0.694
1973–1977	-0.036	0.429	0.965	-0.104	0.405	0.901
1978–1982	0.092	0.361	10.097	0.289	0.328	10.335
1983–1987	-0.379	0.355	0.685	-0.141	0.332	0.868
Education (ref.: secondary)						
University	-0.983	0.166***	0.374	-0.757	0.148***	0.469
Tenure at $t_{n+1}$ (years)	-0.044	0.009***	0.957	-0.052	0.009***	0.949
Regional unemployment at $t_{n+1}$	0.041	0.017*	10.042	0.038	0.016*	10.039
Occupation at $t_n$ (ref.: other)						
Farmers				20.821	0.366***	160.788
Proprietors				0.754	0.198***	20.126
Constant	-10.042	0.344**	0.353	-10.144	0.322***	0.318
Rho	0.212	0.069	0.212	0.079	0.065	0.079
Log likelihood	-9,350.898			-8,930.195		
Wald chi <sup>2</sup>	3,570.57			4,100.56		
N observations	2,107			2,107		
N respondents	1,065			1,065		

Note: The sample is restricted to respondents with high school or university education.

\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$  (2-tailed)

expansion, this percentage remained stable and ranged between 9 and 11 – until the most recent period 2008–2013, when it increased by more than a half. Although this observation should be approached with caution due to the small sample size, it may be a source of some concern. However, much more striking is the data on the incidence of persistent overeducation among the youngest cohorts of respondents, the 21–25-year-olds entering the POLPAN sample in successive waves, which is presented in the last row in Table 11.3. This data confirm that, since the turn of the century, the incidence of persistent overeducation is higher among recent labor market entrants and this effect is becoming stronger through time. The high incidence of persistent overeducation in the youngest cohort, which was interviewed for the first time in 2008, is particularly disturbing. Respondents born in the years 1982–1987 were twice as likely to experience persistent overeducation when they were in their early twenties, compared to respondents born in 1967–1972.

**Table 11.3.** Overeducation at  $t_{n+1}$  among Those Overeducated at  $t_n$ , Persistently Overeducated among All Panel Respondents, and among Workers Aged 21–25 at  $t_n$  (in %)

Period of transition ( $t_n$ - $t_{n+1}$ )	1988–1993	1993–1998	1998–2003	2003–2008	2008–2013
Overeducated at $t_{n+1}$ among those overeducated at $t_n$	62.7	68.6	61.5	50.5	62.3
Percent in persistent overeducation (both $t_n$ and $t_{n+1}$ )	6.1	10.4	10.7	9.2	14.3
Percent in persistent overeducation among 21–25 year-olds at $t_n$	4.2	10.5	16.3	16.0	20.9
No of observations	1294	903	597	510	565

*Note:* percentages in persistent overeducation were calculated on samples including workers with below-secondary education.

## Conclusions

The analyses presented in this chapter point to a high and increasing prevalence of skill mismatches in Poland. According to POLPAN data, currently more than one out of five workers are overeducated for the job they are performing. With respect to the mechanisms which drive the increase in overeducation, the findings offer no reason for optimism. Consistent with job competition and job assignment theories of Thurow

(1972) and Sattinger (1993, 1995), overeducation appears to be primarily the result of mismatches between the occupational and educational structure in Polish society, which emerged as a consequence of the unprecedented educational expansion during the first two decades of the post-communist transition. Among individual workers, the risk of overeducation is determined mainly by the lack of access to well-matched jobs, due to negative signals they offer to prospective employers and/or associated with their place of residence. Although youth and short firm-level tenure are also important predictors of overeducation, as implied by the career mobility hypothesis, on the whole the findings of this study lead me to reject the idea of mismatched jobs as stepping stones to more adequate occupations. The notion of voluntary mismatches paving the way to employment in high-level positions seems unrealistic in light of the high and increasing persistence of overeducation, especially given the length of transition periods which were the focus of this analysis. This tendency is the most visible among the youngest respondents: successive cohorts of workers entering the labor market in the last years were more and more likely to find themselves trapped in jobs requiring less education than they possessed. The latter result is easily explainable in light of Thurow's job competition theory, but difficult to reconcile with Sicherman and Galor's (1990) claims regarding career mobility.

The study found rather limited support for the hypothesis seeking to explain the lack of fit between school attainment and job requirements by the heterogeneity of human capital among workers with the same level of education. In light of the regression results, neither achieving a high score on the Raven test administered during the interview, nor having a diploma in the field of technical or life sciences seems to offer meaningful protection against overeducation. These findings are counter-intuitive, and contradict the popular notion that specializing in these disciplines guarantees labor market success. They may be to some extent due to the rather rough nature of the indicators used in this analysis: the Raven score was based on ten items, and the respondents differed with respect to the POLPAN wave during which they were asked to perform this test. Studying technical or life-sciences may also lead to different outcomes for different cohorts of respondents, due to technological development and curricular change. These complex issues merit further research, preferably on samples restricted to recent graduates. An additional factor which will be growing in importance over the next few years and should be taken into account in future studies, is the distinction between workers



who completed only bachelor's degrees and those who graduated with a master's diploma (as a result of the Bologna Process which has been implemented in Poland in the second half of the last decade).

Consistent with expectations, an important determinant of overeducation with respect to higher education graduates was whether they graduated from a prestigious academic institution or not. However, the interpretation of this finding with regard to the hypotheses of this study is not clear, and depends on whether we treat the reputation of a university as a valid indicator of educational outcomes, or focus solely on the signaling function of diplomas from different institutions. The latter interpretation draws attention to the structural underpinnings of overeducation, rather than differences associated with human capital. However, the two interpretations are not mutually exclusive: both may be true to some extent.

Finally, it should be noted that both interpretations have important policy implications. First, although the idea of overeducation as reflecting a lower level of skills among some diploma holders may be considered relatively unproblematic in that it does not violate the principle of meritocracy, it still means that society may be over-investing in schooling. Second, both interpretations imply that overeducation is likely to become a persistent state for individuals, which may bring about a sense of disappointment and lead to negative psychological outcomes among mismatched workers. Third, and paradoxically, although the phenomenon of overeducation has received increasing public attention throughout the last years, and Poles are now quite well aware that an academic degree no longer guarantees access to desirable jobs (CBOS 2013b), they still perceive higher education to be a prerequisite of labor market success. The reasoning behind such survey responses is understandable in light of the job competition theory, and may be illustrated by the following quote from an interview with a small town journalist conducted in 2004 in Poland: "Education facilitates finding a job. But as a rule, there are many candidates and few jobs (...) Take shop attendants for example. The number of positions has not fallen. It is only that the saleswomen with vocational education have lost their jobs, replaced by university graduates. Although they completed the appropriate vocational school, employers prefer someone with secondary education. The more educated always have better prospects" (Kiersztyn 2008: 260). In light of these opinions it seems likely that despite the growth in overeducation, without adequate policy interventions investment in education will not be reduced, giving rise to a vicious circle of increasingly persistent mismatch.