

Decomposing wage penalties of overeducated workers

Evidence from the Cedefop European Skills and Jobs (EJS) survey



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Research Objectives



- To decompose the observed overeducation wage penalty in order to measure the extent to which the pay gap can be attributed to differences in key observables related to, for example, individual human capital, job requirements and worker job search motives.
- On the basis of the decompositions, to draw conclusions with regard to the relative importance of a number of central theoretical perspectives that have been proposed in the literature as potential explanations for overeducation.
- To assess the extent to which these potential explanations remain consistent between sets of workers with differing skill levels.

Potential explanations



- The overeducation penalty is a statistical artefact arising because lower levels of human capital among mismatched workers are not generally observed in the data (HCT consistent argument; Becker 1964).
- The overeducation penalty arises because individuals are unable to earn their full marginal product as a consequence of productivity constraints related to job characteristics (Assignment theory and Job Competition model; Sattinger 1993; Thurow, 1975).
- The overeducation penalty merely reflects a compensating wage differential effects (McGuinness & Sloane, 2012), job mobility motives (Rosen, 1972), asymmetric information (Jovanavi, 1972).

Data and sample



- *The Cedefop European Skills and Jobs (ESJ) survey* – a new international dataset of skill mismatch of EU adult workers
- Utilise the full sample of adult employees, aged 24-65, in 28 European countries, corresponding to 48,676 cases.
- Overeducation: based on a direct comparison of the highest qualification of individuals (translated to conventional ISCED levels) with the qualification level reported by themselves as necessary to actually do their current job (provides a better match between acquired education and job content).
- Gross log hourly earnings as dependent variable.

Estimation method

- Standard Oaxaca decomposition (Oaxaca, 1973)

$$\bar{W}_m - \bar{W}_{mis} = (\bar{H}_m - \bar{H}_{mis})\hat{\beta}_m + (\bar{Z}_m - \bar{Z}_{mis})\hat{\gamma}_m + (\hat{\gamma}_m - \hat{\gamma}_{mis})\bar{Z}_{mis} + (\hat{\beta}_m - \hat{\beta}_{mis})\bar{X}_{mis}$$

- H denotes human capital and Z job characteristics and worker job search motives.
- The base case is individuals who are matched, so the decomposition algorithm explains the pay premium to being matched relative to the overeducated group.

Key control variables

- HC: Basic age and education augmented by information on training courses attended, skill mismatch, skill gaps.
- Job characteristics: contract status, sector, size.
- Job requirements: The extent to which the job requires advanced literacy, numeracy, ICT and high level soft skills.
- Prior response variables: these capture the workers' motives for choosing the current post and reflect a range of factors:
 - **compensating wage differentials** (job satisfaction, work-life balance, proximity);
 - **job mobility** (career prospects);
 - quality of **job signal** (how much did the worker know about the jobs skill requirements and benefits prior to accepting the post).

Sensitivity of the pay penalty to model specification - OLS



All Workers	<i>Basic HC</i>	<i>Augmented HC</i>	<i>Skill mismatch</i>	<i>Job</i>	<i>Skill needs</i>	<i>Preferences</i>
All Workers	-0.22***	-0.19***	-0.19***	-0.18***	-0.14***	-0.12***
High Skilled Workers	-0.24***	-0.22***	-0.22***	-0.21***	-0.17***	-0.15***
Medium Skilled Workers	-0.18***	-0.15***	-0.15***	-0.14***	-0.09***	-0.08***

Source: Cedefop ESJ survey

Decomposition analysis of wage differentials



	All sample excl. Low- educated	Medium- educated	High- educated
Amount attributable:	0.8	-21.1	15.2
- due to endowments (E):	4.9	3.6	12.0
- due to coefficients (C):	-4.1	-24.7	3.1
Shift coefficient (U):	16.7	32.7	12.5
Raw differential (R) {E+C+U}:	17.4	11.5	27.7
Adjusted differential (D) {C+U}:	12.5	7.9	15.7
Endowments as % total (E/R):	28.1	31.1	43.4
Discrimination as % total (D/R):	71.9	68.9	56.6

Source: Cedefop ESJ survey

Breakdown of endowment effect



	<i>All</i>	<i>High</i>	<i>Medium</i>
<i>% of total raw difference</i>			
HC	5%	16%	27%
Job	9%	7%	15%
Skill needs	18%	7%	36%
Motives	11%	9%	15%
Country FE	-15%	4%	-60%
Total endowment	28%	43%	31%

Source: Cedefop ESJ survey

Conclusion I



- The data can explain over 40% of the differential among high skill workers.
- For medium skilled workers, the variables contained in the data explain over 30% of the wage premium, however, the magnitude of the raw differential is much lower than it would otherwise be due to medium skilled workers being more heavily concentrated in low waged economies.
- Over and above this effect, overeducated medium skilled workers are more likely to be in **jobs characterised by no advanced literacy/advanced / moderate ICT requirements** which depress their relative earnings. Also more (less) likely to be on temporary contracts (to have been promoted).

Conclusions II



- In the high skill equation **human capital** differences and **job requirements** are most important.
- The most significant HC endowment effect relates to age, lower exposure to previous unemployment, receipt of training and field of study influences.
- In terms of job requirements, matched workers also tended to be in larger firms and in posts with advanced literacy requirements which boosts earnings.

Conclusion III



- There is also evidence, for high-skilled workers, of a pay-off to having **good quality information** on the jobs' skill requirements and benefits to accepting it.
- In terms of theory, the research suggests that:
 - HCT, Signalling models and JCM / AT are all relevant for explaining the high-skilled wage gap.
 - The JCM / AT are most relevant for understanding the overeducation pay penalty among medium skilled workers.
- Despite having such detailed data the majority of the differential remains unexplained.