Further education of higher education graduates – the more, the better?

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Introduction

- One out of seven higher education graduates inadequately employed
- Compensation by further education?
- Higher education graduates overrepresented in further education measures

  ➡ Focus on quantity and quality of measures
- Potentially inflationary process, i.e. no positive effect of further eduction among higher education graduates?

Previous research

- Socially unequal opportunities to participate in further education (Behringer, 1999; Büchel/Pannenberg, 2004; Hubert/Wolf, 2007; Schiener, 2006; Schömann/Leschke, 2004)
- High involvement of higher education graduates
- Further education more valued in work environments of highly qualified (Bolder/Hendrich, 2000)
- Disputed and partly contradicting results on returns to further education due to
  - different operationalisations (Wohn, 2007)
  - problem of selectivity
- Studies using selection corrections find small but (mostly) significant effects (Wolter/Schiener 2009)

Theory: Quantity of further education

- Human capital theory (Becker 1964)
  - Investment in human capital increases productivity, i.e. wages (more and longer courses)
  - Marginal utility principle: investment ends when costs exceed utility (saturation)
- Signalling theory (Spence 1973, Stiglitz 1975)
  - Participation in further education as „screening devices“ (more and longer courses) → signals
  - Number of courses: the more, the better

Theory: Quality of further education

- Human capital theory (Becker 1962)
  - Occupation-specific vs. general skills
  - Firms invest in specific skills from which they profit exclusively, less financial benefit for worker
  - Workers invest in general skills which can be used inside and outside firm, more individual profit
  - Lower returns to further education for women due to lower investment in further education measures and career interrupions

Hypotheses

H1 Income returns increase with increasing number and duration of further education courses (until saturation)

H2a Further education courses co-financed by the employer lead to lower monetary returns for the individual employee

H2b General further education courses lead to higher monetary returns for the individual employee than specific further education courses

H3 Women can profit less from their investment in further education than men

Data and methods

- German panel study of 1997 graduate cohort (*HIS Absolventenpanel*)
- Full-time employed (>35 hours/week) only
- Representative survey of graduates from German institutions of tertiary education
- Surveyed 1 and 5 years after graduation
- OLS regressions: estimate of log gross monthly income 1 and 5 years after graduation, full-time workers only (at least 35 hours per week)
- Heckman selection models

Operationalisation

- Further education variables:
  - Number of further education courses within 5 years (x, x^2)
  - Long term measures (1/0)
  - Co-financing by employer (1/0)
  - Changes due to participation in further education (6 categories), e.g. upward mobility, personality/social competencies
- Dependent variable: Logarithmized monthly income 5 years after graduation

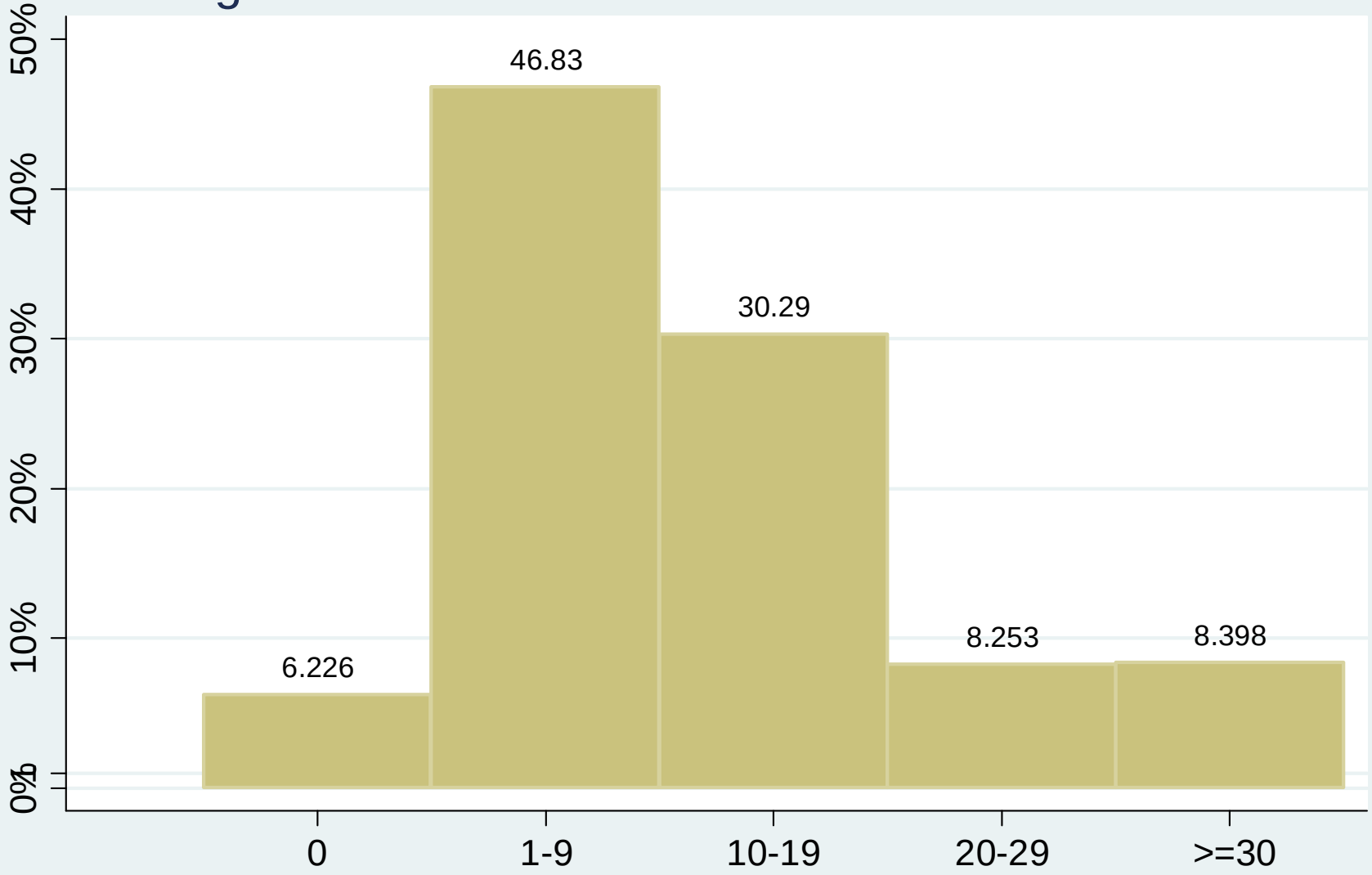
Operationalisation (continued)

- Instrument variables (Heckman selection):
  - Satisfaction with possibilities for further education and training in current job (1 very satisfied – 5 very unsatisfied)
  - Assessment of current workplace, working conditions and work environment: “There is high value set on further education and training.” (1 definitively applies – 5 does not apply at all)

Control variables

- Logarithmized monthly income 1 year after graduation
- Socio-domographic characteristics: educational family background (one parent with ‚Abitur‘), family status (married or not), child(ren) in the household
- Educational biography: accomplished apprenticeship, age at graduation, type of higher education degree
- Previous and current labour market experience: length of unemployment and working experience since graduation, employment in East Germany, labour market position (management, profession), firm size, public sector, civil servant, fixed-term contract

Figure 2: Number of further education measures



Source: HIS Absolventenpanel 1997, own calculations

Figure 1: Type of further education measure

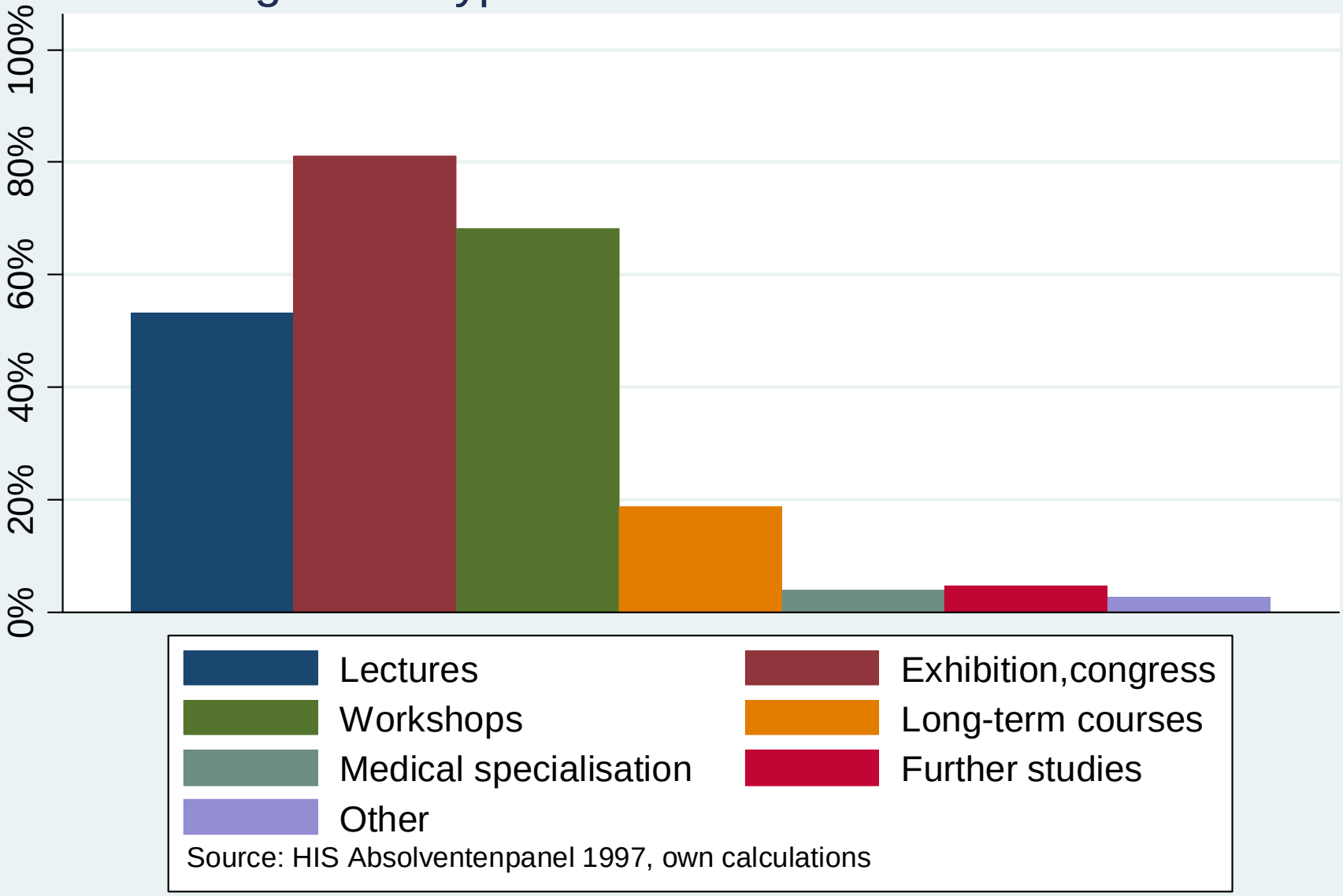
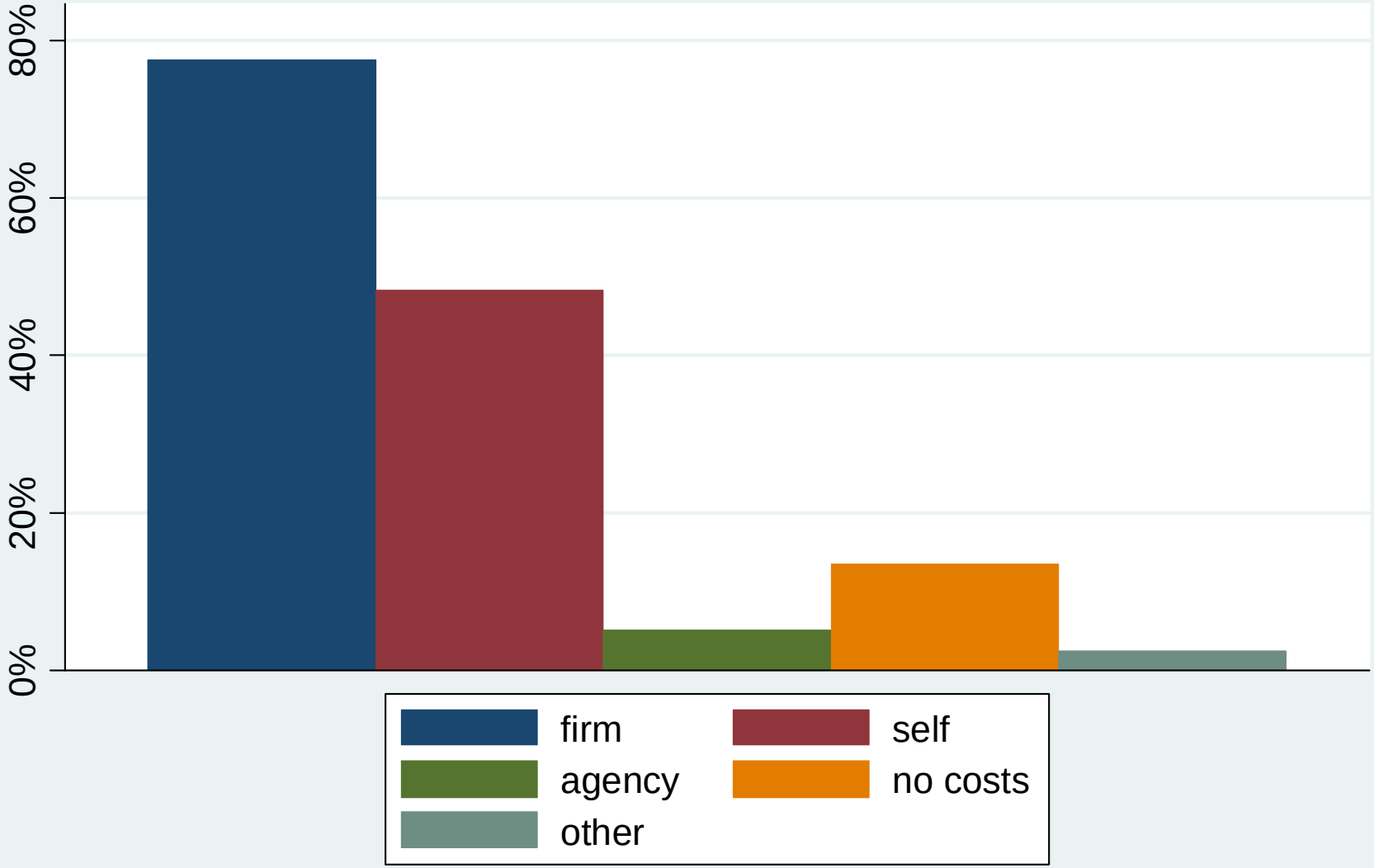
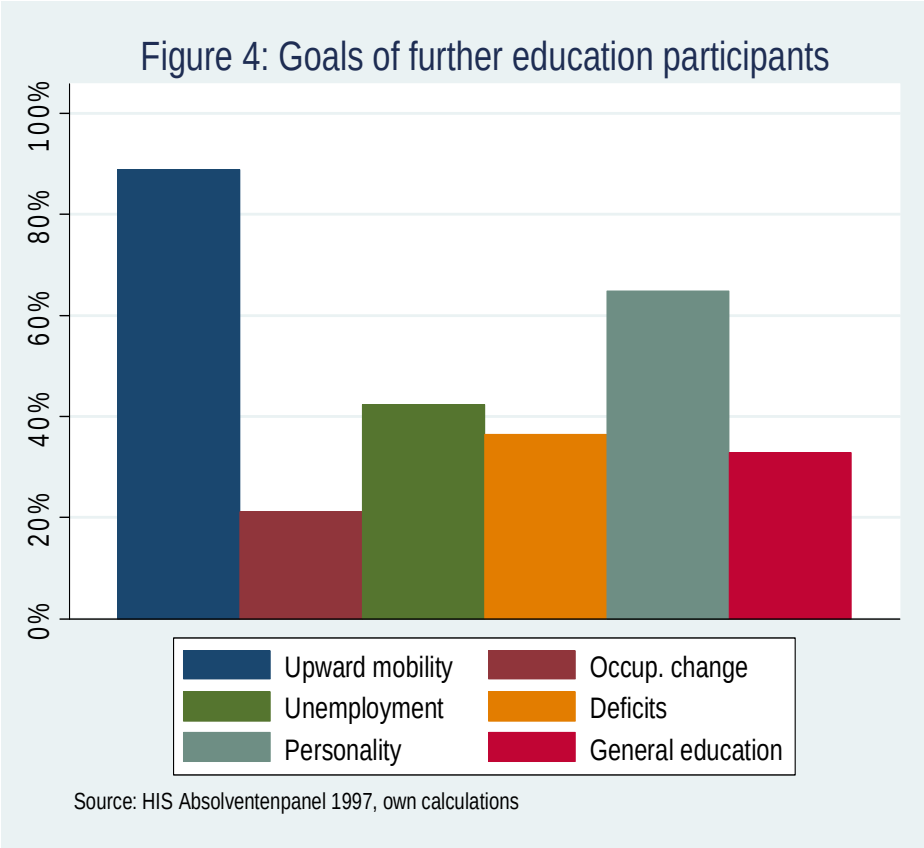


Figure 3: Financial contribution to further education



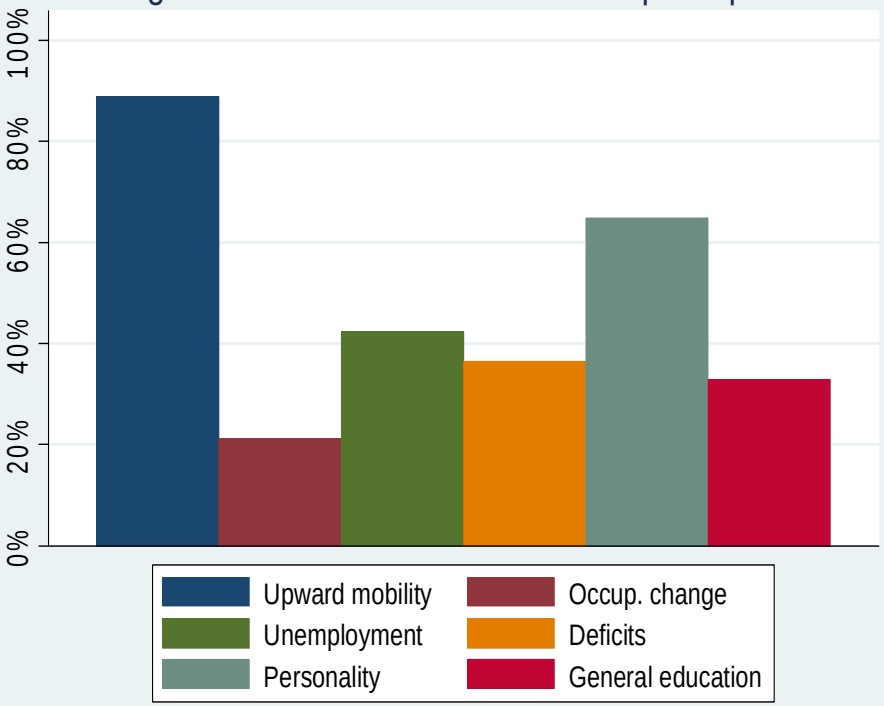
Source: HIS Absolventenpanel 1997, own calculations

Goals of and skills in further education



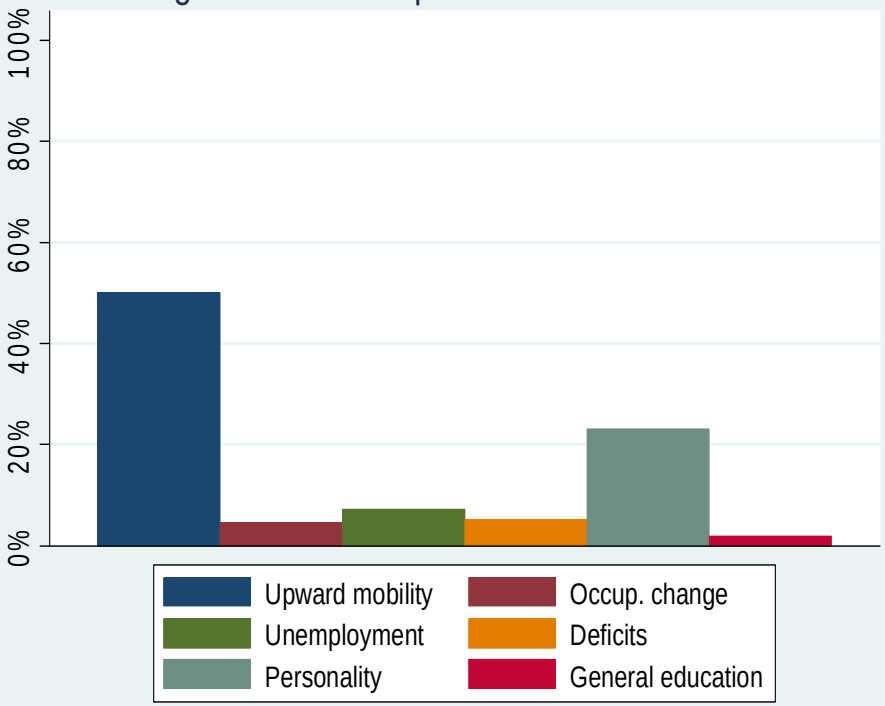
Goals of and skills in further education

Figure 4: Goals of further education participants



Source: HIS Absolventenpanel 1997, own calculations

Figure 5: Skills acquired in further education



Source: HIS Absolventenpanel 1997, own calculations

OLS estimation of ln gross monthly income at T2

Log income T1	0.101**	(0.013)
Quantity of further education		
No. further educ.	0.008**	(0.002)
No. further educ.^{2}	-0.000*	(0.000)
Long further educ.	0.013	(0.012)
Quality of further education		
Employer-paid f.e.	0.042*	(0.018)
Type of f.e. (RC: Upw.mobility)		
Occup. Change	-0.082+	(0.043)
Unemployment	-0.037	(0.035)
Deficits	-0.017	(0.059)
Personality	0.101**	(0.021)
General education	-0.008	(0.090)
Constant	7.058**	(0.103)
R^2	2464	
N	0.376	

** p<0.01, * p<0.05, + p<0.10, standard errors in parentheses

Control variables: woman, married, child, apprenticeship, age, parents‘ education, no. of semesters, type of degree, public sector, large firm, profession/management, unemploy. exp, employ. exp., civil servant, fixed-term contract

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Heckman selection model on ln gross monthly income at T2

	Main model		Selection model	
Log income T1	0.107**	(0.019)		
Quantity of further education				
No. further educ.	0.000	(0.003)		
No. further educ.^{2}	0.000	(0.000)		
Long further educ.	0.033*	(0.017)		
Quality of further education				
Employer-paid f.e.	0.039	(0.027)		
Type of f.e. (RC: Upw.mobility)				
Occup. Change	0.002	(0.062)		
Unemployment	-0.067	(0.061)		
Deficits	-0.089	(0.074)		
Personality	0.089**	(0.027)		
General education	-0.015	(0.108)		
Possibility f.educ.			0.154**	(0.030)
Value furth. educ.			0.109**	(0.031)
Constant	7.112**	(0.166)	-1.342**	(0.023)
athrho			-1.086**	(0.103)
lnsigma			-0.102	(0.184)
N	2380		2380	

** p<0.01, * p<0.05, + p<0.10, standard errors in parentheses

Heckman selection model on ln gross monthly income at T2

	Men		Women	
	Main model	Selection model	Main model	Selection model
Log income T1	0.132**		0.045	
Quantity of further education				
No. further educ.	-0.001		0.001	
No. further educ.^{2}	0.000		0.000	
Long further educ.	0.025		0.024	
Quality of further education				
Employer-paid f.e.	-0.026		0.072+	
Type of f.e. (RC: Upw.mobility)				
Occup. Change	0.001		0.012	
Unemployment	-0.113		-0.044	
Deficits	-0.026		-0.156	
Personality	0.088**		0.072	
General education	0.065		-0.443+	
Possibility f.educ.		0.158**		0.117**
Value furth. educ.		0.135**		0.044
Constant	7.247**	-1.412**	7.361**	-1.085**
athrho		-1.226**		-0.826**
lnsigma		-0.058		-1.030**
N	1580	1580	800	800

** p<0.01, * p<0.05, + p<0.10, standard errors in parentheses

Discussion

- No sign for devaluation of further education among higher education graduates
- Quantity of further education increases income (until saturation)
- Courses co-financed by employer have – contrary to expectations – positive effects on income
- Both effect disappear when controlling for selection into further education
- Personality courses (probably: management, team building, leading) increase income even when controlling for selection
- Only men profit from general skill acquision through further education