Training in Europe – are inequalities of opportunities equal across different countries?

Caroline Wozny
University of Paderborn

Granada, 11th July 2012
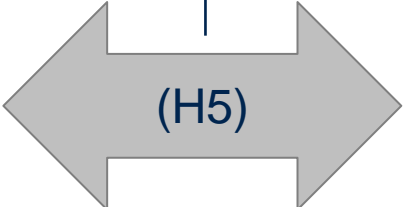
Training & inequality

Gender

- Training participation: Mixed results
  - Male advantage: Dieckhoff & Steiber (2011), Evertsson (2004), Pischke (2001)
  - No differences: Draca & Green (2004), Green & Zanchi (1997), Veum (1996)
  - Female advantage: Jones et al. (2008), Simpson & Stroh (2002)
  - Cross-country differences: Dieckhoff & Steiber (2011), Arulampalam et al. (2004)
- Type of training
  - Women prefer general training (Estevez-Abe et al. 2001, Edlund & Grönlund 2008)

Education

- Training participation
  - Education begets education: e.g. Cloutier et al. (2008), Pischke (2001), Pfeiffer & Reize (2001)
  - Cross-country differences: Pischke (2005), Beck et al. (2009)
- Type of training
  - Employees of lower education tend to get specific training (Goergen et al. 2009)

Hypotheses

		♀	🎓 (crossed out)
Labour market	**Coordinated** Hall & Soskice (2001)	- (H1)	+ (H3)
Education	**Vocational system** Hall & Soskice (2001)	- (H2a)	+ (H4a)
	or	or	or
	University system Beck et al. (2009)	- (H2b)	+ (H4b)

(H5)

Data & method

Individual data (89,028)

- Outcome: participation in work-related training (courses & on-the-job training)

- Gender
- Tertiary education

Country data (22)

- Labour market: mean tenure & union density
- Educational system: ratios of university graduates & vocational graduates

Interactions between individual & institutional variables

Multilevel analysis with random effects for intercepts & slopes

Separate analysis (odds ratios)

	0	1	2	3	4	5	6	7
Female		0.936***	0.975	0.974	0.950	0.933***	0.933***	0.932***
No uni. deg.		0.693***	0.694***	0.694***	0.695***	0.706***	0.705***	0.718***
Mean tenure				0.801***	0.801***		0.842***	0.844***
Union density				1.006	1.006		1.006	1.006
Uni. system				0.994	0.994		1.000	1.001
Voc. system				1.049***	1.050***		1.035***	1.035***
F. X m. tenure					1.014			
F. X union d.					1.000			
F. X uni. syst.					1.004*			
F. X voc. syst.					0.989**			
N. X m. tenure								0.940**
N. X union d.								1.002
N. X uni. syst.								0.994*
N. X voc. syst.								1.012*
Constant	0.661***	0.915	0.948	0.814	0.810	0.901	0.766	0.765
RANDOM								
Sd. intercept	0.753*	0.702**	0.744*	0.391***	0.389***	0.651***	0.431***	0.425***
Sd. female			0.204***	0.203***	0.162***			
Sd. no uni. deg.						0.325***	0.318***	0.251***

*** $p<0.01$, ** $p<0.05$, * $p<0.1$; models 1-7 control for age, type of contract, industry, occupation, firm size, degree of urbanization and year

5

Joint analysis: basic models (odds ratios)

	1	2	3	4	5
Female		0.936***	0.976	0.974	0.973
No university degree		0.693***	0.709***	0.707***	0.706***
Mean tenure					0.836***
Union density					1.006
University system					0.998
Vocational system					1.039***
Constant	0.652***	0.915	0.932	0.927	0.801
RANDOM					
Sd. intercept	0.753*	0.702**	0.676**	0.673***	0.431***
Sd. female			0.190***	0.190***	0.191***
Sd. no university degree			0.317***	0.318***	0.311***
Corr. female – no uni. deg.				-0.515*	-0.546*

*** $p<0.01$, ** $p<0.05$, * $p<0.1$; models 2-5 control for age, type of contract, industry, occupation, firm size, degree of urbanization and year

Joint analysis: interactions with gender (odds ratios)

	6	7	8	9
Female	0.969	0.973	0.972	0.957
No university degree	0.706***	0.706***	0.706***	0.707***
Mean tenure	0.838***	0.836***	0.836***	0.836***
Union density	1.006	1.006	1.006	1.006
University system	0.998	0.998	0.998	0.998
Vocational system	1.039***	1.039***	1.039***	1.040***
Female X mean tenure	0.981			
Female X union density		1.000		
Female X university system			1.002	
Female X vocational system				0.993*
Constant	0.797	0.801	0.800	0.801
RANDOM				
Sd. intercept	0.429***	0.431***	0.432***	0.432***
Sd. female	0.194***	0.191***	0.184***	0.168***
Sd. no university degree	0.311***	0.311***	0.311***	0.310***
Corr. female – no uni. deg.	-0.613*	-0.547*	-0.510*	-0.487*

*** $p<0.01$, ** $p<0.05$, * $p<0.1$; models control for age, type of contract, industry, occupation, firm size, degree of urbanization and year

Joint analysis: interactions with education (odds ratios)

	10	11	12	13
Female	0.974	0.974	0.974	0.974
No university degree	0.699***	0.706***	0.708***	0.713***
Mean tenure	0.840***	0.835***	0.835***	0.835***
Union density	1.006	1.005	1.006	1.006
University system	0.998	0.998	0.999	0.998
Vocational system	1.040***	1.039***	1.039***	1.039***
No uni. X mean tenure	0.958*			
No uni. X union density		1.002		
No uni. X university system			0.997	
No uni. X vocational system				1.004
Constant	0.797	0.801	0.801	0.802
RANDOM				
Sd. intercept	0.428***	0.430***	0.432***	0.432***
Sd. female	0.192***	0.190***	0.191***	0.191***
Sd. no university degree	0.296***	0.306***	0.302***	0.301***
Corr. female – no uni. deg.	-0.597*	-0.546*	-0.520*	-0.502*

*** p<0.01, ** p<0.05, * p<0.1; models control for age, type of contract, industry, occupation, firm size, degree of urbanization and year

Results

	Hypotheses		Separate	Joint
1:	Coordinated labour markets hamper training participation of female employees	Mean tenure	0	0
		Union density	0	0
2a:	Strong vocational systems hamper training participation of female employees	Vocational system	✓	✓
2b:	Strong university systems hamper training participation of female employees.	University system	X	0
3:	Coordinated labour markets favour training participation of lower educated employees.	Mean tenure	X	X
		Union density	0	0
4a:	Strong vocational systems favour training participation of lower educated employees	Vocational system	✓	0
4b:	Strong university systems favour training participation of lower educated employees	University system	X	0
5:	Institutions that favour training for females hamper training for lower educated employees		✓	✓

✓ results support hypothesis, 0 no significant effects, X results oppose hypothesis

Conclusions

	Sep.	Joint
Institutions explain part of the variation in individual training.	✓	✓
Long mean tenure is negatively related to training participation.	✓	✓
Vocation systems are positively related to training participation.	✓	✓
The relationship of institutions & training differs across employees groups.	✓	✓
Women's training is negatively related to strong vocational systems.	✓	✓
Women's training is positively related to strong university systems.	✓	0
Training of lower educated is negatively related to long tenure.	✓	✓
Training of lower educated is positively related to strong vocational systems.	✓	0
Training of lower educated is negatively related to strong university systems.	✓	0
Institutions seem to have opposing effects on women and lower educated.	✓	0
The educational system is opposingly related to training for females and training for lower educated employees.	✓	0
Training of females is negatively related to training of lower educated employees.	✓	✓
The effect of gender on training seems to vary across countries.	✓	✓

Problem

Separate analyses generate significant results for all educational interactions, joint analyses only for the interaction between female and vocational systems.

Which approach should I choose?

Would it be ok to do the separate and the joint one just as robustness check? If yes, how much emphasis should I put on the lack of significance in the robustness check?

BACK-UP

Country	Training participation					Sample size
	All emp.	Female	Male	No uni. d.	Uni. d.	
Austria	0.51	0.52	0.50	0.45	0.71	2,639
Belgium	0.47	0.47	0.46	0.34	0.61	2,550
Bulgaria	0.55	0.55	0.56	0.53	0.62	3,030
Cyprus	0.49	0.50	0.47	0.37	0.68	2,655
Czech Rep.	0.47	0.43	0.51	0.43	0.67	5,633
Denmark	0.48	0.49	0.46	0.39	0.61	2,108
Estonia	0.49	0.53	0.42	0.39	0.66	2,550
Finland	0.63	0.69	0.57	0.52	0.77	2,452
France	0.44	0.43	0.45	0.36	0.62	9,415
Germany	0.55	0.57	0.54	0.49	0.72	3,468
Greece	0.18	0.21	0.16	0.12	0.32	2,711
Hungary	0.14	0.17	0.12	0.12	0.25	4,106
Latvia	0.38	0.49	0.28	0.29	0.65	1,387
Lithuania	0.43	0.49	0.35	0.30	0.67	2,243
Norway	0.61	0.63	0.59	0.55	0.71	2,213
Poland	0.28	0.33	0.25	0.20	0.54	11,482
Portugal	0.29	0.31	0.27	0.23	0.62	5,082
Romania	0.08	0.09	0.08	0.06	0.18	6,430
Slovak Rep.	0.55	0.53	0.57	0.52	0.66	3,126
Spain	0.36	0.39	0.34	0.28	0.51	9,101
Sweden	0.80	0.83	0.77	0.72	0.93	2,481
UK	0.50	0.53	0.47	0.45	0.57	2,166
Overall	0.40	0.42	0.37	0.32	0.58	89,028

Participation in work related training by employee group

Group	Training	Obs.	Mean	Std. dev.	Min	Max
All emp.	All types	89,028	0.3961113	0.4890908	0	1
	Courses	89,028	0.3097902	0.4624096	0	1
	On-the-job	89,028	0.2089792	0.4065818	0	1
Female	All types	44,172	0.4200625	0.4935742	0	1
	Courses	44,172	0.3471883	0.4760816	0	1
	On-the-job	44,172	0.2121253	0.4088178	0	1
Male	All types	44,856	0.3725254	0.4834826	0	1
	Courses	44,856	0.2729624	0.4454866	0	1
	On-the-job	44,856	0.205881	0.4043485	0	1
No uni. d.	All types	63,146	0.3191651	0.4661568	0	1
	Courses	63,146	0.2200139	0.414259	0	1
	On-the-job	63,146	0.1806607	0.3847398	0	1
Uni. degr.	All types	25,882	0.5838421	0.4929299	0	1
	Courses	25,882	0.5288231	0.4991782	0	1
	On-the-job	25,882	0.2780697	0.4480566	0	1

$$Y_{ij} = \gamma_{00} + \gamma_{01}(mean\ tenure_j) + \gamma_{02}(agreement\ coverage_j) + \gamma_{03}(union\ density_j)$$
$$+ \gamma_{04}(university\ graduates_j) + \gamma_{05}(vocational\ graduates_j) + \gamma_{10}(male_{ij})$$
$$+ \gamma_{11}(mean\ tenure_j * male_{ij}) + \gamma_{12}(agreement\ coverage_j * male_{ij})$$
$$+ \gamma_{13}(union\ density_j * male_{ij}) + \gamma_{14}(university\ graduates_j * male_{ij})$$
$$+ \gamma_{15}(vocational\ graduates_j * male_{ij}) + u_{0j} + u_{1j}(male_{ij}) + r_{ij}$$

$$Y_{ij} = \gamma_{00} + \gamma_{01}(mean\ tenure_j) + \gamma_{02}(agreement\ coverage_j) + \gamma_{03}(union\ density_j)$$
$$+ \gamma_{04}(university\ graduates_j) + \gamma_{05}(vocational\ graduates_j)$$
$$+ \gamma_{10}(tertiary\ education_{ij}) + \gamma_{11}(mean\ tenure_j * tertiary\ education_{ij})$$
$$+ \gamma_{12}(agreement\ coverage_j * tertiary\ education_{ij})$$
$$+ \gamma_{13}(union\ density_j * tertiary\ education_{ij})$$
$$+ \gamma_{14}(university\ graduates_j * tertiary\ education_{ij})$$
$$+ \gamma_{15}(vocational\ graduates_j * tertiary\ education_{ij}) + u_{0j}$$
$$+ u_{1j}(tertiary\ education_{ij}) + r_{ij}$$

References

BECK, N., KABST, R., and WALGENBACH, P., 2009. The cultural dependence of vocational training. *Journal of International Business Studies*, 40(8), 1374–1395

CLOUTIER, J., RENAUD, S., and MORIN, L., 2008. Predictors of Participation in Voluntary Vocational Training: An Empirical Study among Canadian Female and Male Managers. Les déterminants de la participation à la formation professionnelle volontaire: une étude auprès de cadres féminins et masculins dans les entreprises canadiennes. *Relations Industrielles / Industrial Relations*, 63(2), 268–289

DIECKHOFF, M., 2007. Does it Work? The Effect of Continuing Training on Labour Market Outcomes: A Comparative Study of Germany, Denmark, and the United Kingdom. *European Sociological Review*, 23(3), 295–308

DRACA, M., and GREEN, C., 2004. The Incidence and Intensity of Employer Funded Training: Australian Evidence on the Impact of Flexible Work. *Scottish Journal of Political Economy*, 51(5), 609–625

ESTEVEZ-ABE, M., 2005. Gender bias in skills and social policies: The varieties of capitalism perspective on sex segregation. *Social Politics*, 12(2), 180–215

References

ESTEVEZ-ABE, M., IVERSEN, T., and SOSKICE, D., 2001. Social protection and the formation of skills: a reinterpretation of the welfare state. *In:* P. A. HALL and D. SOSKICE, eds. *Varieties of capitalism. The institutional foundations of comparative advantage*. Oxford: Oxford Univ. Press, pp. 145–183

EVERTSSON, M., 2004. Formal On-the-Job Training: A Gender-Typed Experience and Wage-Related Advantage? *European Sociological Review*, 20(1), 79–94

GOERGEN, M., BREWSTER, C., and WOOD, G., 2009. Corporate governance and training. *Journal of Industrial Relations*, 51(4), 459–487

GREEN, F., and ZANCHI, L., 1997. Trends in the Training of Male and Female Workers in the United Kingdom. *British Journal of Industrial Relations*, 35(4), 635–644

HALL, P. A., and SOSKICE, D., 2001. An introduction to varieties of capitalism. *In:* P. A. HALL and D. SOSKICE, eds. *Varieties of capitalism. The institutional foundations of comparative advantage*. Oxford: Oxford Univ. Press, pp. 1–70

JONES, M. K., LATREILLE, P. L., and SLOANE, P. J., 2008. Crossing the tracks? Trends in the training of male and female workers in great Britain. *British Journal of Industrial Relations*, 46(2), 268–282

References

PFEIFFER, F., and REIZE, F., 2001. Formelle und informelle berufliche Weiterbildung und Verdienst bei Arbeitnehmern und Selbständigen. *In:* R. K. von WEIZSÄCKER, ed. *Bildung und Beschäftigung*. Berlin: Duncker & Humblot (Schriften des Vereins für Socialpolitik, Gesellschaft für Wirtschafts- und Sozialwissenschaften; N.F., 284), pp. 215–273

PISCHKE, J.-S., 2001. Continuous training in Germany. *Journal of Population Economics*, 14(3), 523

PISCHKE, J.-S., 2005. *Labor Market Institutions, Wages, and Investment: Review and Implications.* INSTITUTE FOR ECONOMIC RESEARCH (IFO), ed. München. (CESifo Economic Studies; 51, 1/2005).

SIMPSON, P. A., and STROH, L. K., 2002. Revisiting gender variation in training. *Feminist Economics*, 8(3), 21–53

VEUM, J. R., 1996. Gender and race differences in company training. *Industrial Relations*, 35(1), 32