UNIVERSITY OF HOHENHEIM

The Labour Supply of Women in STEM

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Motivation

- the thesis “Essays on Occupational Choice“ focuses on occupational segregation
- gender segregation is a key issue in achieving the equality of opportunities
    - different levels of earnings in different jobs/sectors
    - the main driving force for the gender pay gap in Germany and the EU

- occupations in science, engineering, technology, and mathematics STEM have always been highly segregated by gender
    - European policies aim at reducing gender segregation in the labour market
    - many regional and national campaigns aim at increasing women‘s share in STEM (e.g.,“Girl‘s day – Future Prospects for Girls“ in Germany)

Hypotheses

Women in STEM behave differently in terms of labour supply and their reaction to labour market policies differs from other women.

Possible explanations:

1. higher labour participation due to higher wage levels
2. higher labour participation because of high intrinsic motivation
3. less opportunities to work parttime and/or for re-entry after times out of the labour force

Identification strategy

- problems in the econometric analysis of occupational groups:
  - selection effects
  - unobserved heterogeneity
  - biased and inconsistent estimates can occur
- Blundell et al. (1998) introduce a grouping estimator to overcome these problems
- core idea: definition of groups with homogenous developments of net wages and other net income

Data

- EU-SILC cross-sectional waves 2007, 2008, and 2009
- pooled dataset including
  - women born between 1960 and 1990
  - neither retired nor in education, military or social services
  - approximately 205.000 individuals included
- division of the data set into 72 groups per wave by 10-year birth cohort, educational level, geographical area, and working in STEM
- data on the national level of spending on childcare (% of GDP in CC) and on the national level of spending on family allowances and child benefits (% of GDP on FA) is merged from the online database of Eurostat

Estimation results: final estimation of labour supply

Variable	Weekly working hours Coefficient	Std. Dev	Weekly working hours Coefficient	Std. Dev	Weekly working hours Coefficient	Std. Dev
working in STEM	7.082***	0.965	8.040***	1.021	-12.44	25465.3
youngest child 0-3	-3.565***	0.240	-3.516***	0.246	-3.339***	0.285
youngest child 4-6	-3.349***	0.123	-3.327***	0.125	-3.146***	0.143
youngest child 7-10	-2.775***	0.090	-2.751***	0.092	-2.536***	0.105
STEM x yc 0-3	1.016***	0.243	1.005***	0.243	0.881***	0.271
STEM x yc 4-6	1.151***	0.239	1.142***	0.239	0.976***	0.268
STEM x yc 7-10	1.174***	0.214	1.174***	0.214	0.965***	0.239
high education	1.295***	0.046	1.334***	0.047	1.496***	0.056
% of GDP in FA			-2016.1***	289.4	-1785.2***	351.8
% of GDP in CC			405.4**	156.7	309.3+	180.2
STEM x % of GDP in FA			-38.53+	20.5	-46.89+	25.15
STEM x % of GDP in CC			-138.5***	33.54	-144.2***	39.49
N	161879		161879		113949	
Adj. R^2	0.226		0.228		0.258	

Source: EU-SILC 2007, 2008, 2009, own calculations. + p<0.1, * p<0.05, ** p<0.01, *** p<0.001.

Notes:

All three models include a complete set of group and time effects as well as country and birth cohort effects. It is also controlled for log wage, non-wife income, estimated residuals of three reduced forms.

Modell (3) only includes cohabiting women.

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Conclusion

- empirical results indicate significant differences in the employment behaviour of women in STEM and of women in other occupations
- socio-demographic variables:
  - women, especially mothers, work more hours if working in STEM
  - but: women in STEM are more often out of the labour force
- influence of institutional settings:
  - higher spendings on childcare increase female labour supply
  - higher spendings on family allowances decrease female labour supply
  - additional effects for women in STEM are small in size
- further research needs to include firm-level data to control for working conditions, e.g., the provision of parttime jobs

Thank you for your attention!

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Descriptive results

Variable	Mean	Std. Dev.	min	max	N
Women in STEM					
labour participation	0.747	0.435	0	1	22692
hours worked per week	38.351	6.890	1	84	16877
year of birth	1971.03	7.504	1960	1990	22692
youngest child 0-3	0.143	0.350	0	1	22692
youngest child 4-6	0.101	0.301	0	1	22692
youngest child 7-10	0.122	0.327	0	1	22692
Women in other occupations					
labour participation	0.801	0.399	0	1	181918
hours worked per week	35.66	9.499	1	99	145002
year of birth	1971.35	7.624	1960	1990	181918
youngest child 0-3	0.157	0.364	0	1	181918
youngest child 4-6	0.110	0.312	0	1	181918
youngest child 7-10	0.125	0.331	0	1	181918

Source: EU-SILC 2007, 2008, 2009; own calculations.