Putting the GDR's Legacy Effect under the Microscope:

Eastern Female STEM Professionals in Reunified Germany.

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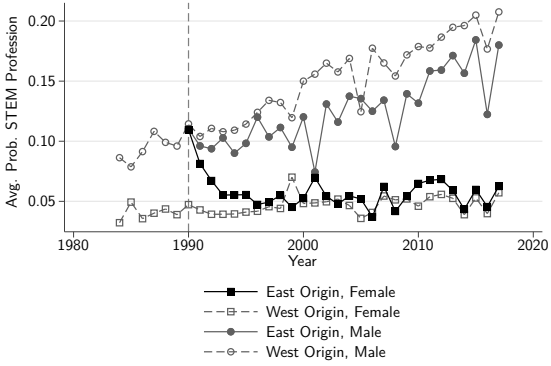
Motivation

Definition. STEM, field and curriculum centred on education in the disciplines of **S**cience, **T**echnology, **E**ngineering, and **M**athematics (Hallinen, 2024).

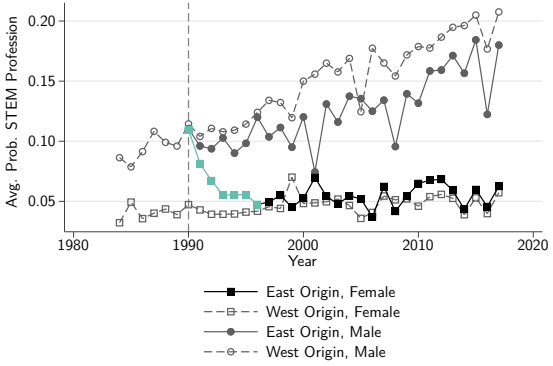
Figure: Time Trend (by Region and Gender), 1984–2017



Avg. Bin Size (Std. Dev.): 1,629 (1,400)

Source: Socio-Economic Panel (SOEP) (2023). Own calculations.

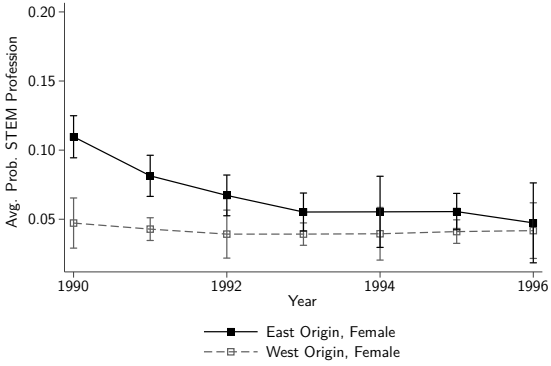
Figure: Time Trend (by Region and Gender), 1984–2017



Avg. Bin Size (Std. Dev.): 1,629 (1,400)

Source: Socio-Economic Panel (SOEP) (2023). Own calculations.

Figure: Time Trend (by Region and Gender), 1990–1996



Avg. Bin Size (Std. Dev.): 1,089 (744)

Source: Socio-Economic Panel (SOEP) (2023). Own calculations.

Previous Literature

- 92% of all **female apprentices** in the GDR were concentrated in thirteen **occupational groups**, compared to five in the FRG (Menschik and Leopold, 1974).
- **Horizontal segregation** in the labour sector in the GDR was not nearly as high as in the societies of the Western bloc (Lane, 1983).

- Of the **female apprentices** who successfully passed their skilled labour examination (*Facharbeiterprüfung*) in 1980, **17%** were in the **STEM field** (Staatliche Zentralverwaltung für Statistik, 1981, p. 293).
- Unlike in the FRG, in the GDR there was the **same school curriculum for boys and girls** with the same **emphasis on science and maths** (Fuchs-Schündeln and Masella, 2016; Lippmann and Senik, 2018).

- In 1949, females made up 40% of the total labour force both in the GDR and in the FRG.
- Unlike the West German females, **East German females remained in the labour market** after the economic upturn in the 1960s Menschik and Leopold (1974).

Notizen einarbeiten!

Research Question

What drives the downward trend of East German females in STEM professions in the first six years after reunification?

Empirical Approach

- Compare East German females with East German males.
  - East German males and females had the same probability of working as a STEM professional in 1990 (what about before?).
  - Examine in what way they each were affected by the reunification.
- Define the treatment as years after unification $\times$ being female.

Table: Examples of STEM Professions (sorted by Frequency)

ISCO-88 Code	Professional title
[2149]	Architects, engineers and related scientists
[3152]	Health, environmental and quality inspectors
[3119]	Materials and engineering specialists
[2142]	Civil engineers
[3121]	Data processing assistants
[3111]	Chemo- and physicotechnician
[2145]	Mechanical engineers
[3114]	Electronics and telecommunications technology
[3120]	Data processing specialists
[2144]	Electronics and telecommunications engineers
...	

Econometric Specification

$$\begin{aligned} Stem_{itr} =& \beta_0 + \beta_1 Dist\_Reunification_t + \beta_2 Female_i + \\ & \beta_3 Dist\_Reunification \times Female_{it} + X_{itr}\gamma + \epsilon_{itr} \end{aligned} \tag{1}$$

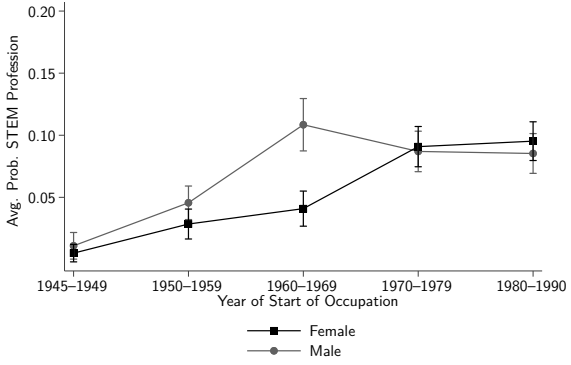
with $Dist\_Reunification_t = Survey\_Year_t - 1990$.

Data

Preliminary Results

Validity

Figure: Cohorts (Start of Occupation by Gender), 1945–1990



Avg. Bin Size (Std. Dev.): 891 (340)

Source: Mayer (1995). Own calculations.

Table: Share of Females in the Skilled Labour Force by Economic Sector in 1971 (in %)

Labour sector	Selected Segment	Below the age of						Total
		25	30	40	50	60	60+	
Technical sciences		32.6	16.4	8.6	4.3	3.0	1.1	9.3
	Mechanical engineering	24.2	10.1	4.1	1.1	0.5	0.2	4.8
	Textile technology (mechanical)	84.0	67.8	41.3	23.3	16.8	5.2	36.7
	Chemical engineering	60.3	50.3	39.1	38.0	29.2	17.2	42.1
	Automation engineering	18.3	6.1	3.8	0.6	1.4	0.0	5.8
	Electrical engineering	13.6	4.1	2.7	1.2	0.3	0.1	2.7
	Energy technology	16.3	8.9	4.6	2.9	2.2	0.9	6.1
	Construction industry technology	34.3	17.6	6.3	1.6	0.5	0.2	6.6
	Mining engineering	15.8	3.5	1.4	0.5	0.3	0.0	1.5
Economic sciences		72.4	53.2	37.5	18.8	15.0	8.9	30.4
Medicine, Agricultural sciences		53.4	40.3	29.8	14.7	10.2	4.1	25.3
	Medical and Pharmacy technology	96.7	89.9	84.2	64.8	36.6	20.1	76.8
	Agricultural sciences	46.0	29.3	21.6	10.3	6.7	1.3	18.3
Cultural, Educational, and Sports sciences		95.4	86.8	80.0	72.1	64.9	43.3	80.0
Literature, Journalism		71.4	46.8	35.6	34.6	32.7	17.3	34.9

Source: (Staatliche Zentralverwaltung für Statistik, 1973, p. 442). Own calculations.

Main Findings

Table: Margins (dy/dx) of Logit Regressions with y = being a STEM Professional

	(1)	(2)	(3)	(4)
Years after Reunification	-0.0008	-0.0027	-0.0027	-0.0027
	(0.0016)	(0.0017)	(0.0017)	(0.0017)
Female	-0.0022	-0.0032	-0.0032	-0.0032
	(0.0088)	(0.0088)	(0.0088)	(0.0088)
Years after Reunification × Female	-0.0121***	-0.0101***	-0.0101***	-0.0101***
	(0.0028)	(0.0029)	(0.0029)	(0.0029)
Residence in West Germany		0.0474***	0.0474***	0.0474***
		(0.0174)	(0.0174)	(0.0174)
Resisdence in West Germany × Female		-0.0517*	-0.0517*	-0.0517*
		(0.0309)	(0.0309)	(0.0309)
Observations	14,632	14,632	14,632	14,632

Source: Socio-Economic Panel (SOEP) (2023). Own calculations.

Discussion

Conclusion

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