Female Teachers: The Roots of Women's Emancipation

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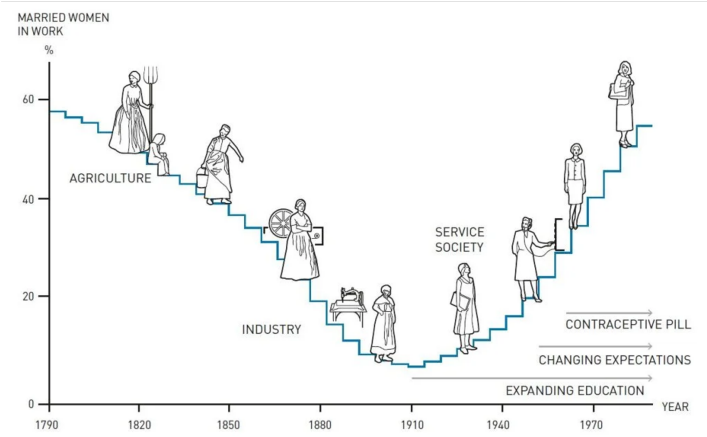
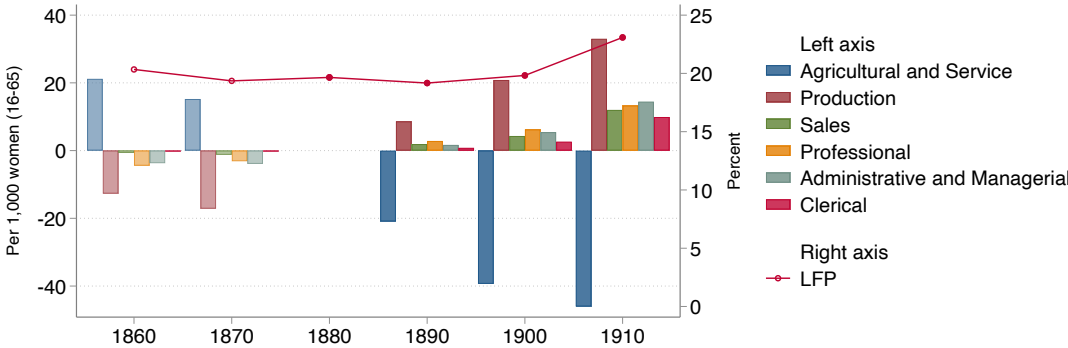
Female Labor Force Participation



Source: Goldin, Nobel Lecture 2023

Occupational Structure of Sweden

Changes Relative to 1880 for Women



▸ Levels ▸ Men (change) ▸ Men (levels) ▸ Modal occupations by sector

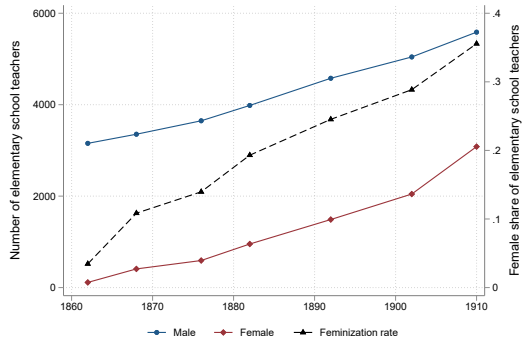
Preview of Results

- Girl who had a female school teacher were
  - More likely to enter non-domestic work
  - In particular entry into professional and clerical occupations were 24% higher relative to the baseline.
- Girls taught by female teachers were more active in the women's suffrage movement (1902–1921)

Sweden in the 19th and Early 20th Centuries

The Feminization of the Swedish Teaching Profession

- The school Act of 1842.
- Women gain the right to teach in elementary schools in 1859.
- Teaching required secondary education.
- Employment protection and national minimum wage (equal for men and women)



▸ Teachers' Seminary Graduates ▸ Royal Seminary Graduates

Sweden in the 19th and Early 20th Centuries

The Impact of Female Teachers: Hypotheses

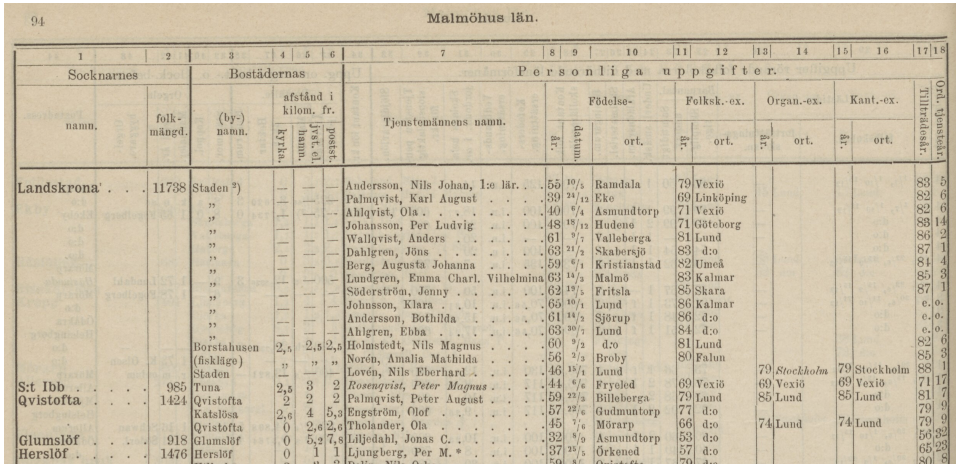
- The first female teacher marks the start of the local emancipation of women
- In their local societies, female teachers
  - embodied a rejection of pre-industrial gender norms
  - were the most politically active (e.g., over-representation among female suffrage elite)

Data

- **Demography and occupation**
  - Full-count decennial censuses of Sweden 1880–1910:
    - Individual-level data on year and place of birth, place of residence, civil status, occupation, and family relationships in a household
- **Teachers**
  - Full-count registries of elementary school teachers in 1876, 1882, and 1889 ★
    - Each teacher's name, year of birth, graduation, and employment in the school district (approx 100 000 data points)
- **Women's suffrage movement 1902–1921**
  - Membership numbers and reports for each local chapter ★
  - Number of signatories in the 1913–1914 petition for women's suffrage ★
- **Elections**
  - City council elections in Sweden 1910–1919
  - Municipal elections of 1919 ★

Data Sources

The 1889 Registry of Elementary School Teachers



94 Malmöhus län.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Socknarnes		Bostädernas				Personliga uppgifter.											
namn.	folk-mängd.	(by-) namn.	afstånd i kilom. fr. kyrka.	afstånd i kilom. fr. hamn.	afstånd i kilom. fr. poast.	Tjenstemännens namn.	Födelse- år.	Födelse- datum.	Födelse- ort.	Folksk.-ex. år.	Folksk.-ex. ort.	Organ.-ex. år.	Organ.-ex. ort.	Kant.-ex. år.	Kant.-ex. ort.	Tillträdesår.	Ord. tjenstår.
Landskrona . . .	11738	Staden [2])	—	—	—	Andersson, Nils Johan, 1:e lär. .	55	10/5	Ramdala	79	Vexiö					83	5
		,,	—	—	—	Palmqvist, Karl August . . .	39	24/12	Eke	69	Linköping					82	6
		,,	—	—	—	Ahlqvist, Ola	40	6/4	Asmundtorp	71	Vexiö					82	6
		,,	—	—	—	Johansson, Per Ludvig . . .	48	18/12	Hudene	71	Göteborg					83	14
		,,	—	—	—	Wallqvist, Anders	61	9/7	Valleberga	81	Lund					86	2
		,,	—	—	—	Dahlgren, Jöns	63	21/2	Skabersjö	83	d:o					87	1
		,,	—	—	—	Berg, Augusta Johanna . . .	59	6/1	Kristianstad	82	Umeå					84	4
		,,	—	—	—	Lundgren, Emma Charl. Vilhelmina	63	14/3	Malmö	83	Kalmar					85	3
		,,	—	—	—	Söderström, Jenny	62	13/5	Fritsla	85	Skara					87	1
		,,	—	—	—	Johnsson, Klara	65	10/1	Lund	86	Kalmar					e.	o.
		,,	—	—	—	Andersson, Bothilda	61	14/2	Sjörup	86	d:o					e.	o.
		,,	—	—	—	Ahlgren, Ebba	63	30/7	Lund	84	d:o					e.	o.
		Borstahusen	2,5	2,5	2,5	Holmstedt, Nils Magnus . . .	60	9/2	d:o	81	Lund					82	6
		(fiskläge)	,,	,,	,,	Norén, Amalia Mathilda . . .	56	2/3	Broby	80	Falun					88	3
		Staden	—	—	—	Lovén, Nils Eberhard	46	15/1	Lund			79	*Stockholm*	79	Stockholm	88	1
S:t Ibb	985	Tuna	2,5	3	2	*Rosenqvist, Peter Magnus* . . .	44	6/6	Fryeled	69	Vexiö	69	Vexiö	69	Vexiö	71	17
Qvistofta	1424	Qvistofta	2	2	2	Palmqvist, Peter August . . .	59	23/3	Billeberga	79	Lund	85	Lund	85	Lund	81	17
		Katslösa	2,6	4	5,3	Engström, Olof	57	22/6	Gudmuntorp	77	d:o					79	9
		Qvistofta	0	2,6	2,6	Thelander, Ola	45	7/6	Mörarp	66	d:o	74	Lund	74	Lund	79	9
Glumslöf	918	Glumslöf	0	5,2	7,8	Liljedahl, Jonas C.	32	8/9	Asmundtorp	53	d:o					56	23
Herslöf	1476	Herslöf	0	1	1	Ljungberg, Per M. *	37	25/5	Örkened	57	d:o					65	23

Teacher Data Summary

- Individual teacher data from 2 223 school districts from three years (1876, 1882, 1889).
- In total 13 209 teacher-school district-year observations.

Empirical Analysis

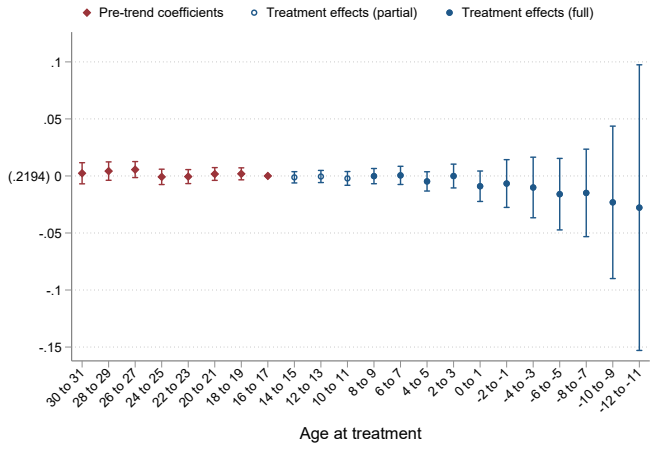
DiD with Multiple Time Periods

- For each school district s identify the the first year a female teacher is hired E_s
- Use place and year of birth for individual i in census t to identify where and when they went to school.
- Sample: Women born 1840–1880
- Placebo: Attending school before female teacher hired.
- Partially Treated: Attending school at the time of first female teacher hired.
- Treated: Attending school after first female teacher hired.

$$\text{Occupation}_{sct} = \alpha_{st} + \gamma_{ct} + \sum_{a \neq 16} \beta_{aE_s} \times \mathbf{1}[E_s - c = a] + \epsilon_{sct}, \tag{1}$$

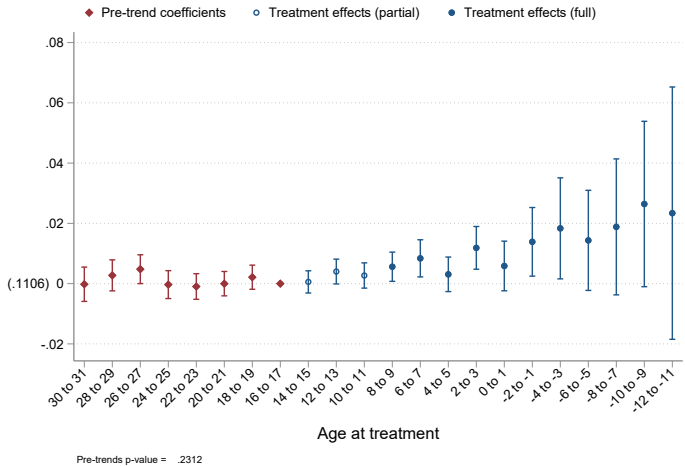
Empirical Analysis

Has Occupation



Empirical Analysis

Has Non-Domestic Occupation



▸ TWFE ▸ Not yet treated ▸ Men

Empirical Analysis

Breakdown by Sectors of Work: Women

	Avg ATT			Reject
Sector of work	First 10 years	Next 10 years	Control mean	$\beta_{pre} = 0$
Professional	0.0025^{***}	0.0030	0.0145	Yes
	(0.0009)	(0.0022)		
Admin and Managerial	-0.0009	-0.0043^{***}	0.0119	Yes
	(0.0007)	(0.0016)		
Clerical	0.0012^{***}	0.0026^{**}	0.0025	Yes
	(0.0004)	(0.0013)		
Sales	-0.0002	-0.0012	0.0072	Yes
	(0.0006)	(0.0014)		
Agricultural and Service	-0.0058^{*}	-0.0146	0.1468	Yes
	(0.0031)	(0.0099)		
Production	0.0020	0.0045	0.0396	Yes
	(0.0014)	(0.0037)		

▸ Men ▸ Alternative measures ▸ Demographic outcomes

Empirical Analysis

Breakdown by Skill: Women

	Avg ATT			Reject
Skill level	First 10 years	Next 10 years	Control mean	$\beta_{pre} = 0$
Unskilled	-0.0046	-0.0161^{*}	0.1371	Yes
	(0.0028)	(0.0096)		
Skilled	0.0034^{*}	0.0064	0.0765	Yes
	(0.0019)	(0.0050)		

Conclusion

- We use new historical data to understand the root of female emancipation in Sweden.
- The rise of female primary school teachers was a catalyst for women economic empowerment.
- Results on political participation and robustness tests in the paper.

Thank you

Empirical Analysis

Breakdown by Sectors of Work: Men

	Avg ATT			Reject
Sector of work	First 10 years	Next 10 years	Control mean	$\beta_{pre} = 0$
Professional	-0.0026^{*}	-0.0163^{***}	0.0269	Yes
	(0.0015)	(0.0043)		
Admin and Managerial	-0.0088^{***}	-0.0240^{***}	0.0240	Yes
	(0.0014)	(0.0035)		
Clerical	-0.0028^{**}	-0.0065^{**}	0.0264	No
	(0.0014)	(0.0033)		
Sales	-0.0014	-0.0104^{*}	0.0277	Yes
	(0.0015)	(0.0054)		
Service	-0.0018	-0.0057^{*}	0.0462	Yes
	(0.0014)	(0.0033)		
Agricultural	0.0369^{***}	0.1231^{***}	0.2919	No
	(0.0055)	(0.0155)		
Production	0.0015	0.0059	0.3900	No
	(0.0043)	(0.0102)		

▸ Alternative measures ▸ Back

Empirical Analysis

Understanding Impacts on Demography

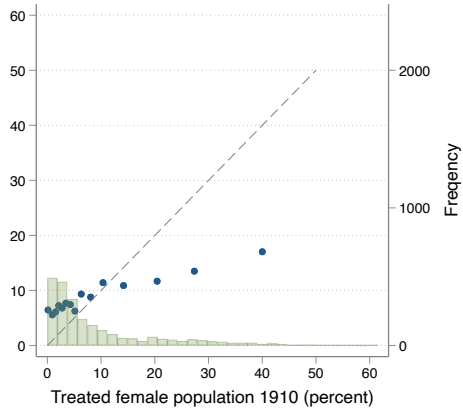
	Avg ATT			Reject
Sector of work	First 10 years	Next 10 years	Control mean	$\beta_{pre} = 0$
Married	0.0166^{***}	0.0574^{***}	0.5955	Yes
	(0.0036)	(0.0100)		
Age difference husband	0.0811	0.2514	-3.3535	No
	(0.0578)	(0.1544)		
Children in HH	0.0189^{***}	0.0696^{***}	0.5768	Yes
	(0.0039)	(0.0107)		
# children in HH	0.0887^{***}	0.3814^{***}	1.8004	No
	(0.0224)	(0.0509)		
Migrated (dummy)	0.0017	-0.0211	0.3932	No
	(0.0040)	(0.0130)		
Moved to sthlm (dummy)	-0.0023	-0.0086	0.0790	Yes
	(0.0021)	(0.0070)		
Migration distance (IHS)	-0.0178^{***}	-0.0611^{***}	0.0146	No
	(0.0063)	(0.0188)		

Empirical Analysis

Women's suffrage movement

Local Chapter for Women's Suffrage 1902–1921

Signatories in 1913–1914 Women's Suffrage Petition



Empirical Analysis

Discussion

- Female teachers increase women's entry into professional and clerical occupations and lower their entry into domestic work.
- There is no impact on production (manual labor).
- This supports the hypothesis that female teachers served as role models for girls entering male-dominated fields.
- Effect sizes increase with time in line with an interpretation of the first female teacher the starting point of woman's emancipation locally.
- *Alternative interpretation*: Female teachers clustered around female-only teacher seminaries. Their girls could benefit from the proximity to educational opportunities.

Outline

Next Steps

Next Steps

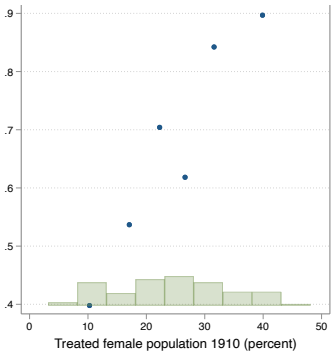
Social and Electoral Effects

- We can link petition signatories and women's suffragists to the 1910 census (TBD)
- Electoral outcomes in, e.g., 1919 only exist at the district level
- Today, we explore if exposure to female teachers explains variations in our social movement and electoral outcomes:
  - Unit of analysis: Parishes and cities
  - Explanatory variable: "Treated" female population 1910 (i.e., the fraction of women in 1910 who grew up in a school district with female teachers)
- Use the 1930 census in which demographic outcomes are better measured (e.g., includes years of schooling, year of marriage, income, and wealth)

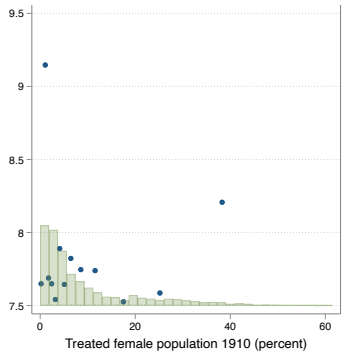
Next Steps

Politics around the time of enfranchisement

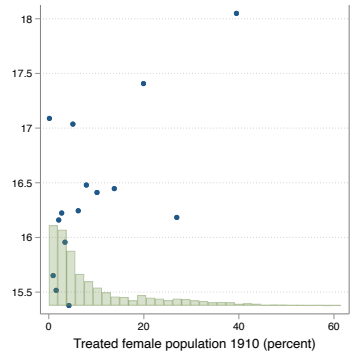
Woman Elected to City Council <1919



Male-Female Turnout Gap 1919



Female In-Person Voting 1919



Next Steps

Exploring Other Sources of Exogenous Treatment Variation

- Distance to female (male) teachers' seminaries is highly predictive of the geographic distribution of female (male) teachers
- The age of pension was nationally set to 55 years of age and 30 years of work
- This creates an opportunity for an IV design that combines
  (a) geographical distance to female seminary
  (b) time until the age of pension of male teachers in the previous registry

Thank you

Occupational Structure of Sweden c. 1900

Breakdown

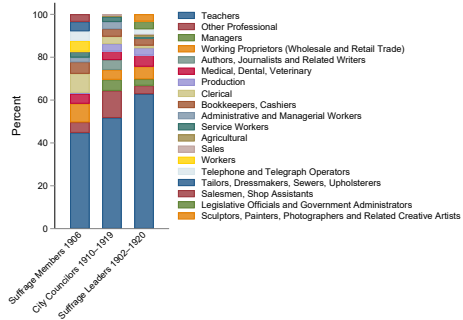


Figure: Selected Groups of Women

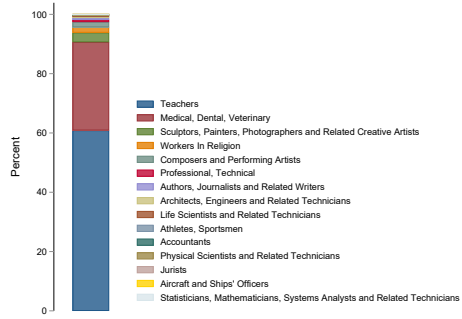
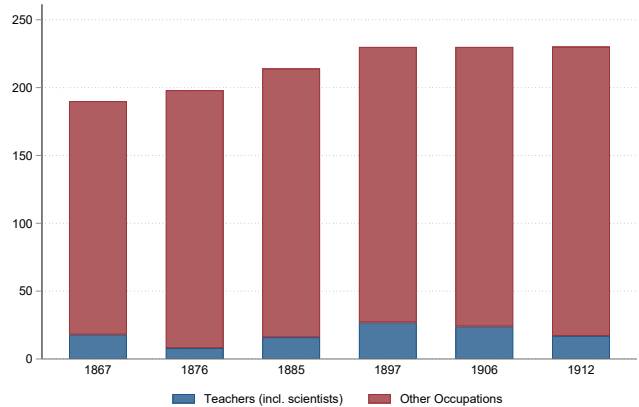


Figure: Professional, Technical 1910

Occupational Structure of Sweden c. 1900

Members of the Second Chamber

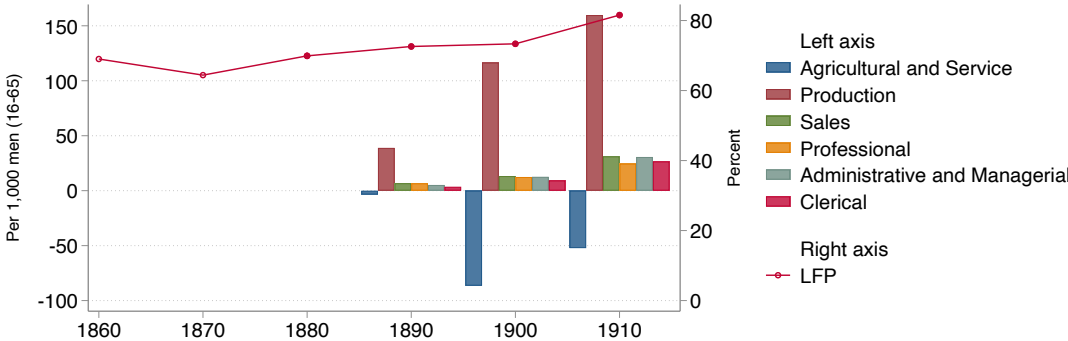


Occupational Structure of Sweden c. 1900

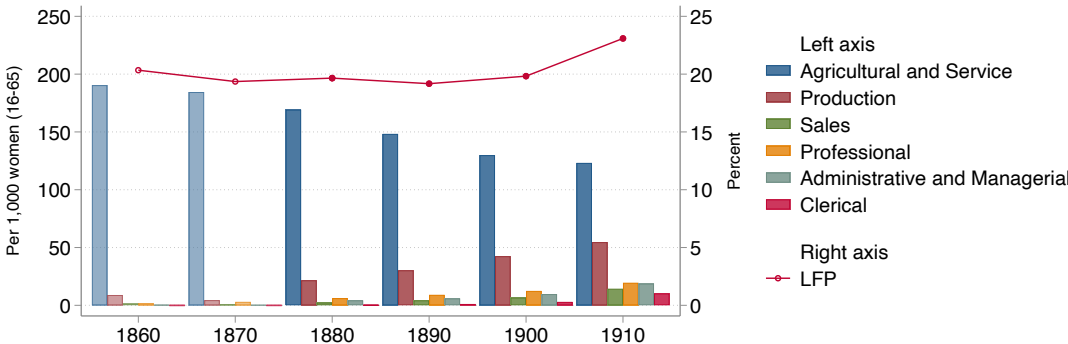
Most common occupation for women in HISCO Major codes

HISCO Major	Mode: HISCO Minor 2
0 Professional	Professional Midwives
1 Professional	Primary Education Teachers
2 Administrative and Managerial	Housekeeping and Related Service Supervisors
3 Clerical	Correspondence and Reporting Clerks
4 Sales	Salesmen, Shop Assistants and Demonstrators
5 Service	Maids and Related Housekeeping Service Workers Not Elsewhere Classi
6 Agricultural	General Farmers
7 Production	Sewers and Embroiderers
8 Production	Shoe Cutters, Lasters, Sewers, and Related Workers
9 Production	Workers Not Elsewhere Classified

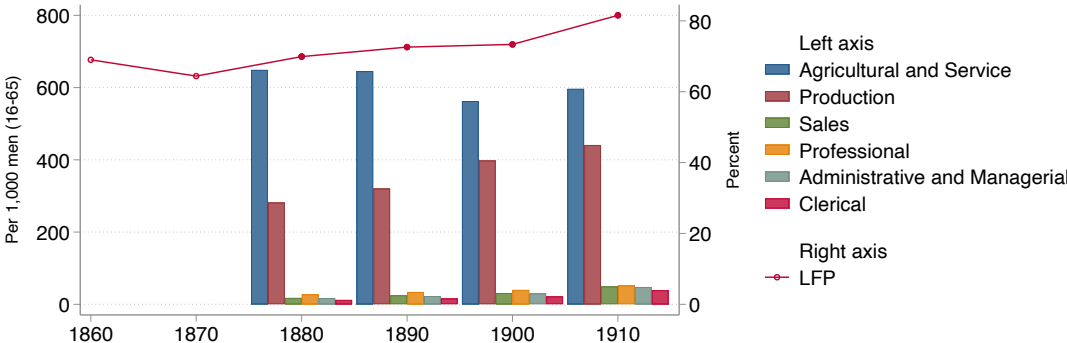
Occupational Structure of Sweden c. 1900



Occupational Structure of Sweden c. 1900

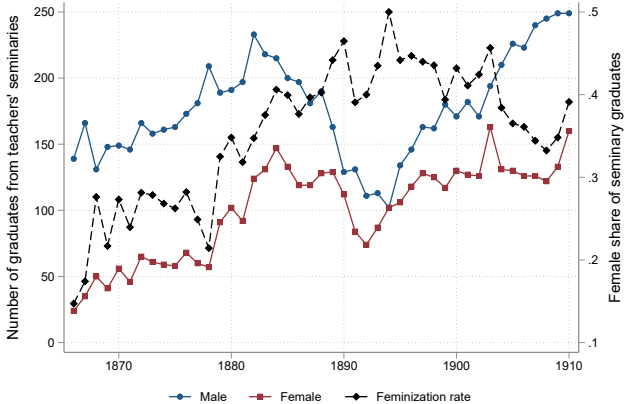


Occupational Structure of Sweden c. 1900



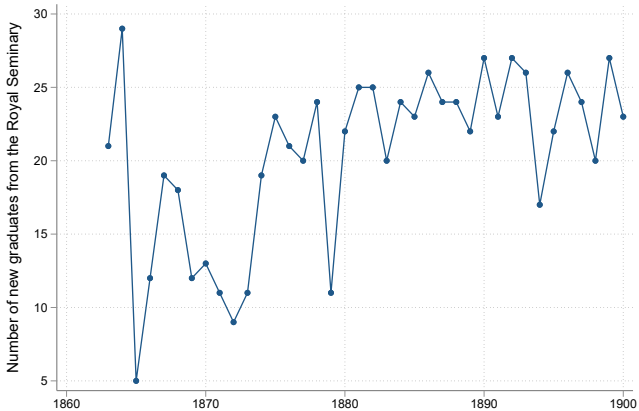
Sweden in the 19th and Early 20th Centuries

Teachers' Seminary Graduates



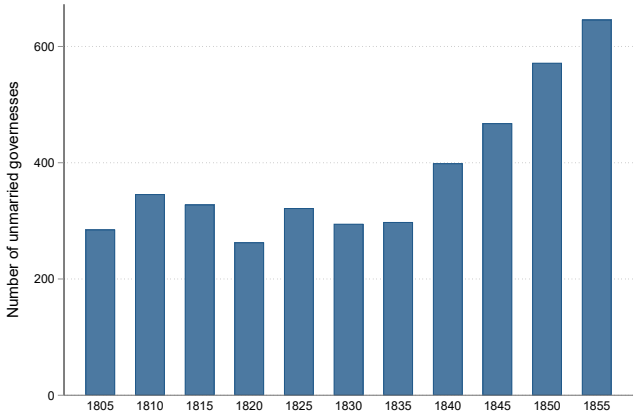
Sweden in the 19th and Early 20th Centuries

Royal Seminary Graduates



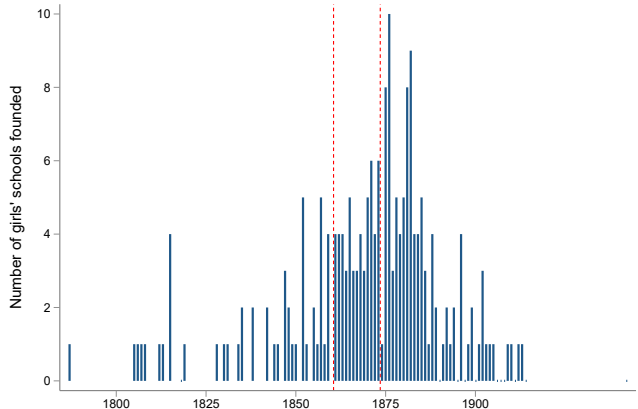
Sweden in the 19th and Early 20th Centuries

Unmarried Governesses



Sweden in the 19th and Early 20th Centuries

Girls' Schools



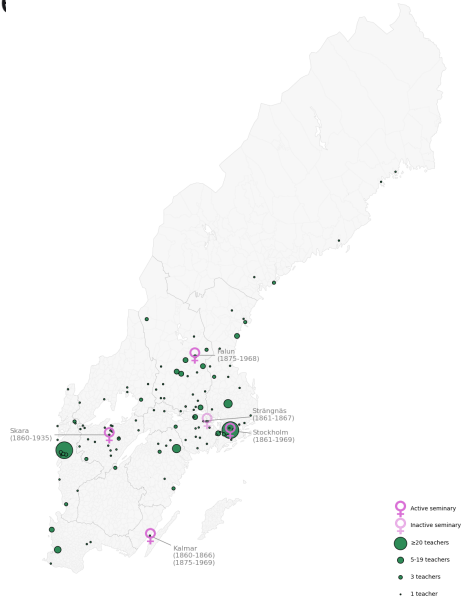
Empirical Analysis

Balance: Female vs. Male Seminary Locations 1861

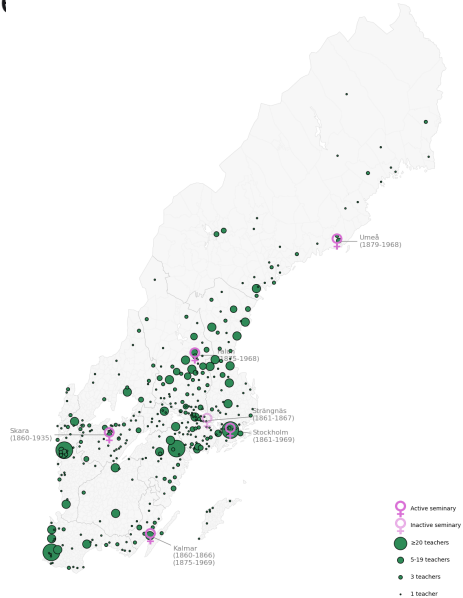
	Female	Male	Unit
No. girls' schools 1860	7	9	City
Avg. no. newspapers 1860	3	2	City
Avg. pop. growth 1840–1860	0.37	0.47	City
No. bishops who affirm same-sex seminaries 1858	1	1	Diocese
Avg. no. fixed schools per parish 1839	.87	.32	Diocese
Avg. no. fixed schools per parish (excl. Stockholm) 1839	.32	.32	Diocese

Notes: Seminary locations as given in 1861. Female: Kalmar; Skara; Stockholm; Strängnäs. Male: Göteborg; Härnösand; Karlstad; Linköping, Lund; Uppsala; Visby; Västerås; Växjö.

Data Sources: Teache



Data Sources: Teache



Data Preparation

Creating Stable School Districts

- Starting from out newly created year accurate polygons for all school district and birth places (boundaries change significantly between 1840-1880).
- We create stable school districts:
  1. Their union covers all of Sweden, are pairwise disjoint, and have boundaries unchanged over time
  2. Each school district in 1876, 1882, and 1889 belong to exactly one stable school district
  3. Individuals born in the same place between 1840 and 1880 belong to the same, single stable school district

Data Preparation

Linking Teachers to Individuals

- Let p_i be the birth parish – birth year combination of individual i
- Let $\mathcal{S}^t$ be the set of school districts in registry t.
- A stable school district is a collection of $\{p, s\}$
- Thus for i with p_i all of the teachers present in any s in your stable school district are potential teachers.

Data Preparation

First Female Teacher

- Let $t_0(S_i)$ be the first year in which a stable school district S_i hired a female teacher
- We measure $t_0(S_i)$ as the minimum start year of teachers who work in S_i
- $t_0(S_i)$ is measured with error since we have not digitized all registers of teachers

Data Sources

Identifying School Districts With Female Teachers Using Census Data

Here we compare the 1889 register with the 1890 census to confirm that using occupation data from the census to identify elementary school teachers is unreliable:

Table: Occupation string

	Census	
Register	1	0
1	131	278
0	56	1926

Table: HISCO minor group 133

	Census	
Register	1	0
1	331	78
0	1268	714

Empirical Analysis

Fixed Effects Results: Share of female teachers

Dependent variable:	Has occupation $(= 1)$							
	(1)	(2)	(3)	(4)	Age: 20–29 (5)	Age: 30–39 (6)	Age: 40–49 (7)	Census: 1910 (8)
Share female teachers	0.108^{***}	0.093^{***}	0.049^{***}	0.040^{***}	0.036^{**}	0.058^{***}	0.089^{***}	0.064^{***}
	(0.025)	(0.028)	(0.011)	(0.012)	(0.016)	(0.010)	(0.014)	(0.010)
Census FEs	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FEs	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Urban FEs	No	No	Yes	No	Yes	Yes	Yes	Yes
Pct. pop. density in 1880 FEs	No	No	No	Yes	No	No	No	No
Censuses	3	3	3	3	2	2	1	1
Cohorts	18	18	18	18	18	18	9	18
School districts	2223	2223	2223	2223	2223	2223	2219	2223
Observations	1655853	1655853	1655853	1655853	669749	600225	263472	578374
Control mean	0.236	0.236	0.236	0.236	0.298	0.181	0.181	0.189

Empirical Analysis

Fixed Effects Results: Men

Dependent variable:	Has occupation $(= 1)$							
	(1)	(2)	(3)	(4)	Age: 20–29 (5)	Age: 30–39 (6)	Age: 40–49 (7)	Census: 1910 (8)
Female teacher $(= 1)$	0.030^{**}	0.052^{***}	0.032^{***}	0.017^{***}	0.053^{***}	0.023^{***}	0.003	0.015^{***}
	(0.015)	(0.013)	(0.006)	(0.005)	(0.010)	(0.004)	(0.002)	(0.003)
Census FEs	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FEs	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Urban FEs	No	No	Yes	No	Yes	Yes	Yes	Yes
Pct. pop. density in 1880 FEs	No	No	No	Yes	No	No	No	No
Censuses	3	3	3	3	2	2	1	1
Cohorts	18	18	18	18	18	18	9	18
School districts	2223	2223	2223	2223	2223	2223	2219	2223
Observations	1606054	1606054	1606054	1606054	661183	579404	239884	549430
Control mean	0.748	0.748	0.748	0.748	0.616	0.898	0.962	0.944

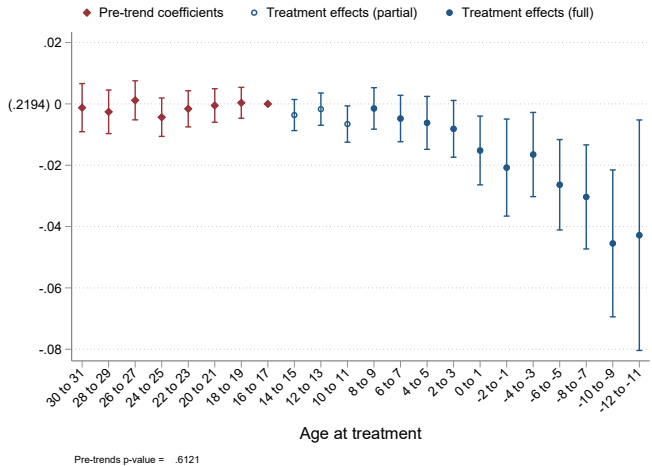
Empirical Analysis

Fixed Effects Results: Same-Sex Teacher Effect

Dependent variable:	Has occupation $(= 1)$							
					Age: 20–29	Age: 30–39	Age: 40–49	Census: 1910
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female teacher $(= 1)$	0.015^{***}	-0.016^{***}	-0.018^{***}	-0.007	-0.048^{***}	-0.004	0.037^{***}	0.008
	(0.005)	(0.004)	(0.004)	(0.005)	(0.008)	(0.004)	(0.007)	(0.005)
Census FEs	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FEs	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Urban FEs	No	No	Yes	No	Yes	Yes	Yes	Yes
Pct. pop. density in 1880 FEs	No	No	No	Yes	No	No	No	No
Censuses	3	3	3	3	2	2	1	1
Cohorts	18	18	18	18	18	18	9	18
School districts	2223	2223	2223	2223	2223	2223	2219	2223
Observations	3261907	3261907	3261907	3261907	1330932	1179629	503356	1127804
Control mean	0.488	0.488	0.488	0.488	0.456	0.534	0.556	0.557

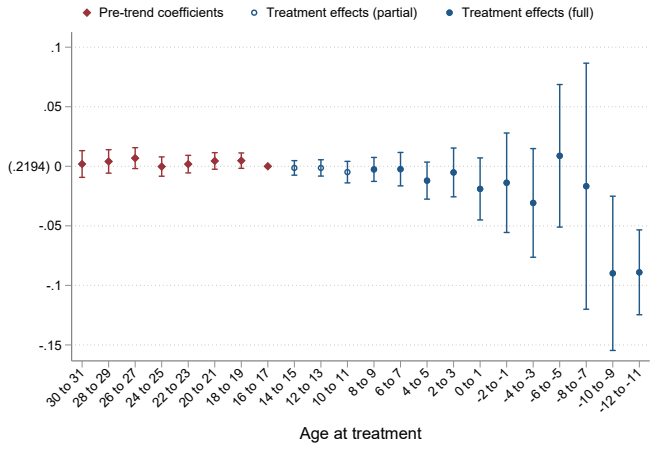
Empirical Analysis

Has Occupation: TWFE



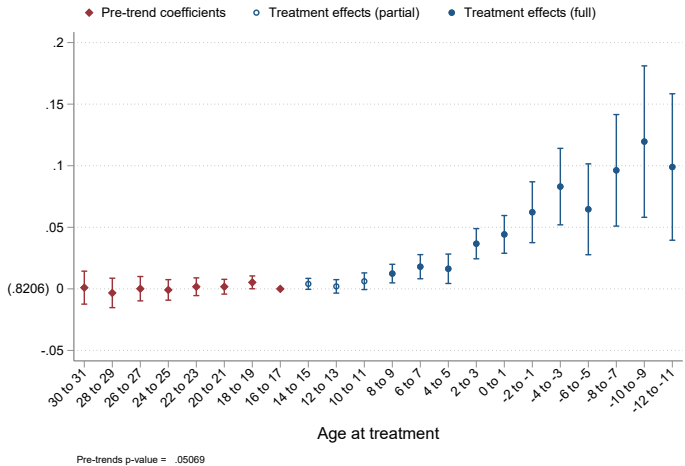
Empirical Analysis

Has Occupation: Not Yet Treated as Control



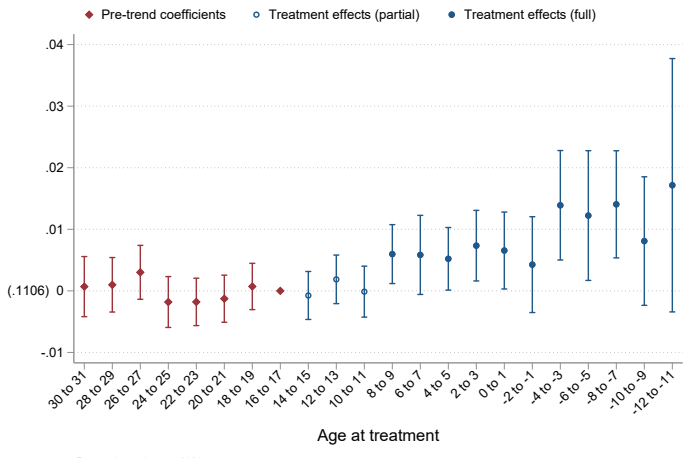
Empirical Analysis

Has Occupation: Men



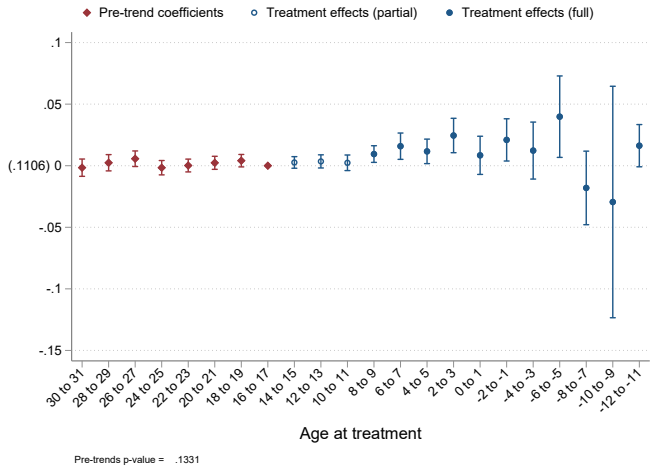
Empirical Analysis

Has Non-Domestic Occupation: TWFE



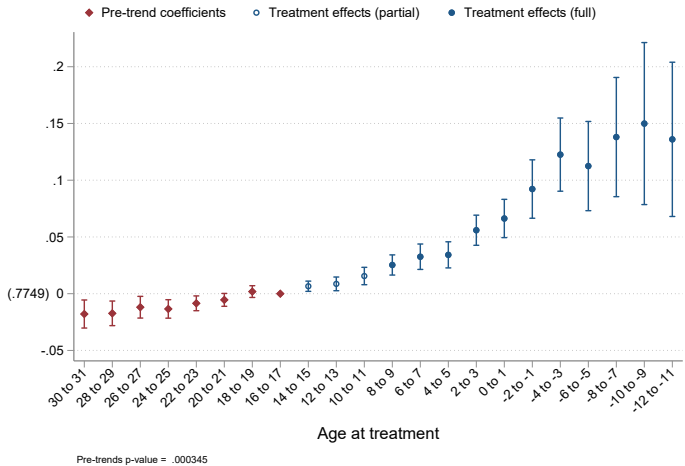
Empirical Analysis

Has Non-Domestic Occupation: Not Yet Treated as Control



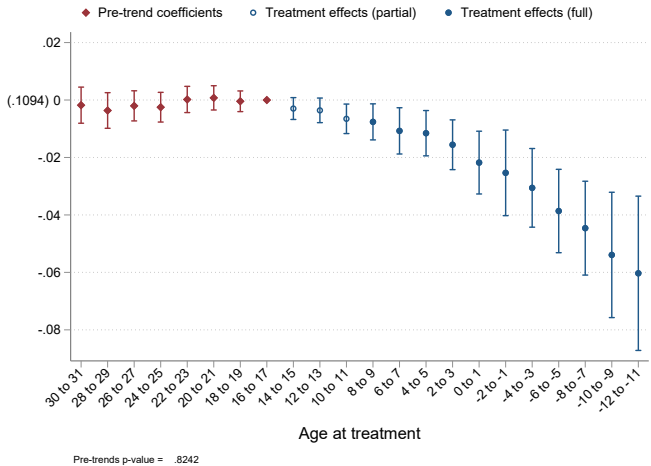
Empirical Analysis

Has Non-domestic Occupation: Men



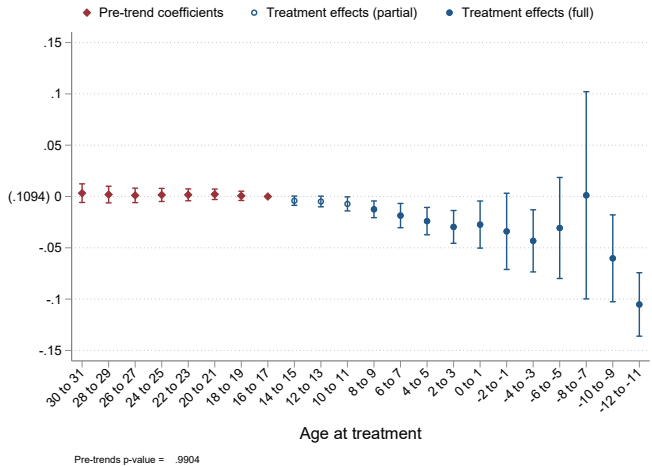
Empirical Analysis

Has Non-Domestic Occupation: TWFE



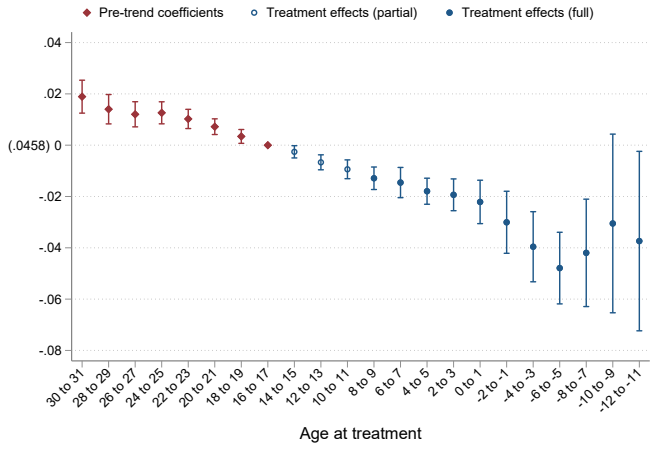
Empirical Analysis

Has Non-Domestic Occupation: Not Yet Treated as Control



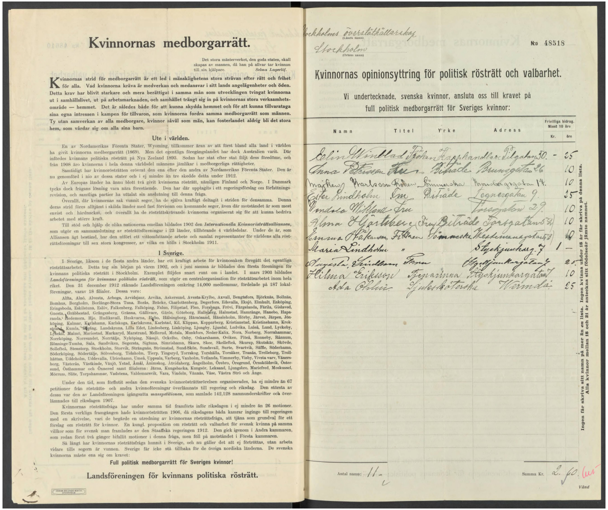
Empirical Analysis

Has Non-domestic Occupation: Men



Data

A List of Signatures From the 1913–1914 Petition for Women's Suffrage



Definition

Definition of “Emancipation of Women” in Oxford Reference

The achievement of complete (a) economic, (b) social, (c) political and (d) religious equality of women with men.

On Women’s Rights in Hannusch et al. (2022)

Women have gradually gained rights in many areas of life, and this legal expansion has been closely intertwined with economic development. [W]e distinguish between four types of women’s rights—economic, political, labor, and body.

Empirical Analysis

Breakdown by Sectors of Work: Alternative measures

	Avg ATT			Reject
Sector of work	First 10 years	Next 10 years	Control mean	$\beta_{pre} = 0$
Admin and Managerial (not servant)	-0.0004	-0.0039^{**}	0.0089	Yes
	(0.0006)	(0.0016)		
Service (not servant)	0.0004	0.0032	0.0325	No
	(0.0013)	(0.0038)		
Agricultural (adjusted)	-0.0003	0.0081	0.3232	No
	(0.0033)	(0.0089)		

Empirical Analysis

Breakdown by Sectors of Work: Alternative measures

	Avg ATT			Reject
Sector of work	First 10 years	Next 10 years	Control mean	$\beta_{pre} = 0$
Admin and Managerial (not servant)	-0.0088^{***}	-0.0240^{***}	0.0240	Yes
	(0.0014)	(0.0035)		
Service (not servant)	-0.0016	-0.0054^{*}	0.0459	Yes
	(0.0014)	(0.0032)		
Agricultural (adjusted)	-0.0075^{**}	-0.0157^{*}	0.3978	No
	(0.0038)	(0.0085)		

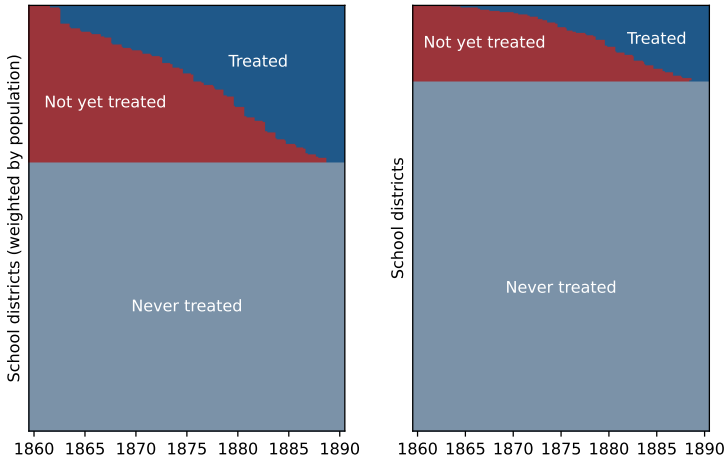
Empirical Analysis

Demographics: Men

Sector of work	Treatment effect	Std. Err.	Pre-trends p-value	Control mean
Married	0.0237^{***}	0.0525^{***}	0.5617	Yes
	(0.0037)	(0.0091)		
Age difference husband	0.0401	-0.0282	1.4594	Yes
	(0.0645)	(0.2057)		
Children in HH	0.0248^{***}	0.0553^{***}	0.4804	Yes
	(0.0043)	(0.0102)		
# children in HH	0.1090^{***}	0.2860^{***}	1.4892	Yes
	(0.0226)	(0.0605)		
Migrated (dummy)	-0.0018	-0.0141	0.3821	Yes
	(0.0041)	(0.0138)		
Moved to sthlm (dummy)	0.0035^{*}	0.0087	0.0734	Yes
	(0.0021)	(0.0064)		
Migration distance (IHS)	-0.0182^{**}	-0.0288	0.0251	Yes
	(0.0080)	(0.0254)		

Empirical analysis

Event Study Treatment Variation



Related Literature and Contribution

- Female education, social change, women's emancipation, and the broader emancipation of historically marginalized groups.

  (Althoff and Reichardt, 2024; Bühler, Vollmer, and Wimmer, 2024; Fernández, 2013; Goldin, 2021; Nekoei and Sinn, 2021)
- Determinants of human capital (Goldin, 2024) and many more.
- Feminization of the teaching profession and the impact of female teachers on female students in the early development of national primary education.

  (Cappelli and Quiroga Valle, 2021; Card et al., 2022; Florin, 1987).

Sweden in the 19th and Early 20th Centuries

The Rise of Mass Schooling

Year	Enrolment ratio (%)	School year in days	Teachers	Schools
1812	5.4	36		
1814				957
1839			1,537	1,516
1843	21.2	60		
1847				2,785
1868	64.9	89	7,045	6,919
1890	72.9	122	13,508	10,563
1910	75.3	166	21,585	14,894

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Summary Statistics

School Districts

	Registry year		
	1876	1882	1889
# school districts (stable)	2223	2223	2223
# school districts (in registry)	2218	2270	2364
# schools	4519	5020	5451
# teachers	3569	4220	5420
% female teachers	8.01	13.27	20.79
% school districts with female teachers	5.53	10.98	17.00
% school districts with only female teachers	0.54	0.94	1.12

Summary Statistics

Teachers

	Registry year					
	1876		1882		1889	
	♀	♂	♀	♂	♀	♂
Age	31.70	40.20	32.61	38.75	33.89	39.86
	(7.20)	(10.61)	(7.25)	(10.10)	(8.11)	(10.67)
Years since graduation	6.13	16.87	7.88	15.38	10.00	16.41
	(3.90)	(9.94)	(4.72)	(10.25)	(5.88)	(10.61)
Years in current position	3.33	12.56	5.01	10.69	7.51	12.04
	(3.34)	(10.17)	(3.96)	(9.30)	(5.54)	(9.21)
School district population density	1539.15	123.06	1333.53	130.29	1688.67	169.92
	(1788.59)	(534.60)	(1739.31)	(528.25)	(1883.52)	(632.94)