

Frontier History and Gender Norms in the United States

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Motivation

- ▶ Gender inequality varies widely across countries even among those at similar levels of development and despite widespread technological change favoring female empowerment.
- ▶ Substantial variation in gender inequality in the world
 - ▶ across countries, within countries
 - ▶ over time: change but also persistence
- ▶ Sources of variation in gender roles
 - ▶ Technology
 - ▶ Culture (including ethnolinguistic, religious traditions)
 - ▶ Natural experiments in history affecting sex ratios and other shocks (WWII, birth control pill, etc.)
 - ▶ Historical agricultural practices
 - ▶ Institutions including family structures
- ▶ *This paper: persistent, many-sided impact of American frontier history on gender norms*

Preview: Frontier Conditions and Women's Lives

Isolation

1. **low density**: isolation from others within given county
2. **remoteness from urban centers**: limited government and social infrastructure

Distinctive demographics

- ▶ sharply **male-biased** sex ratios
- ▶ disproportionately **prime-age** adult

Women on the Frontier

- ▶ more likely to be **married** (early, with older men)
- ▶ **high fertility** (proxied by child-women ratios)
- ▶ less “**gainful employment**”, but among working women, **higher status occupations**

Preview: The Legacy of the Frontier on Gender Norms

We trace out the frontier legacy w/ measure of total frontier experience (TFE) historically

- ▶ FLFP remained persistently lower in high-TFE counties
- ▶ Low FLFP \neq greater leisure; rather, more domestic work
(likely mirroring the historical domestic burden, though lack time use data then)
- ▶ Conservative gender attitudes incl. among women
- ▶ Lower participation in politics

Contributions to the Literature

1. Cultural and Historical Origins of Gender Roles

e.g., Fernandez et al, 2004; Goldin & Shim, 2004; Fogli & Veldkamp, 2011; Alesina et al, 2013

→ frontier settlement and conservative gender norms, distinctive geography of gender inequality

2. Historical Debates: Women on the Frontier

e.g., Fragher, 2008; Jeffrey, 1998; Jensen, 1981; Myres, 1982

→ reconciling seemingly competing historical narratives with quantitative analysis and insights from family economics

3. Comparative Perspective: Settlement of Australia and Gender Norms

Baranov et al, 2020, 2021; Grosjean & Khattar, 2019

→ new insights on social isolation mechanism, possibly distinct in U.S.

Mapping the Frontier

- ▶ Census started tracking frontier in 1874, noticing settlement contours

- ▶ We **follow Turner (1893) & Census (1890)**

*F.J. Turner (1893) and the Progress of the Nation report from 1890 Census: American frontier is a "form of society" that comprises counties with low population density in close proximity to the frontier line. In the census reports it is treated as **the margin of that settlement which has a density of two or more to the square mile.***

- ▶ **Frontier declared 'closed' in 1890**, according to Turner & Census:
*up to and including 1890 the country had a frontier of settlement, but at present the unsettled area has been so broken into by isolated bodies of settlement that **there can hardly be said to be a frontier line.***

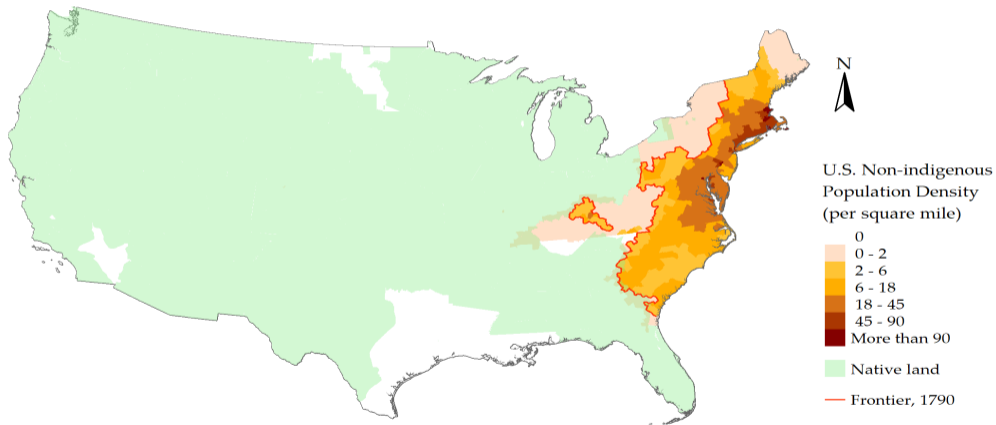
Mapping the Frontier

- ▶ **Locate frontier line and trace it over time**
 - ▶ contour line for population density of 2 people/mi²

America's Westward Expansion

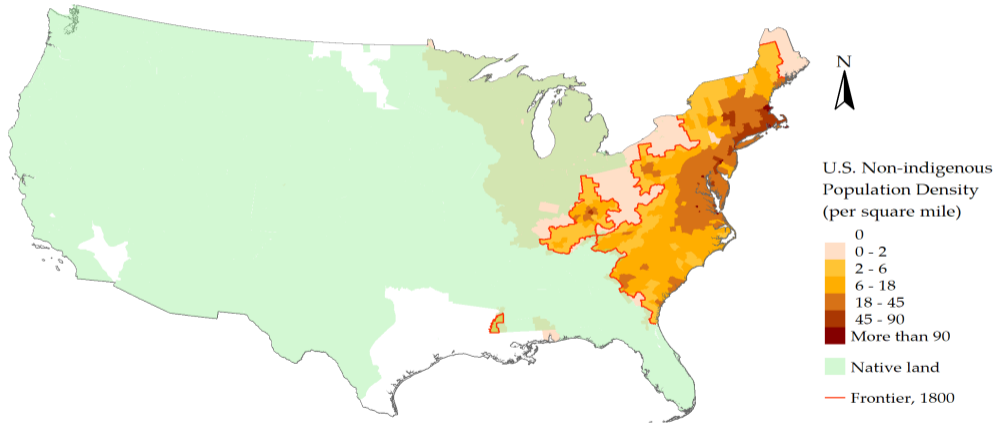
America's Westward Expansion

1790



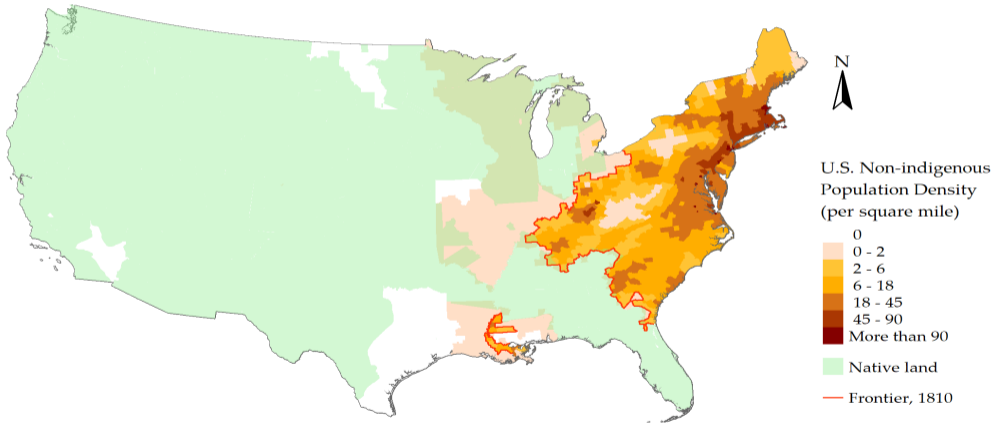
America's Westward Expansion

1800



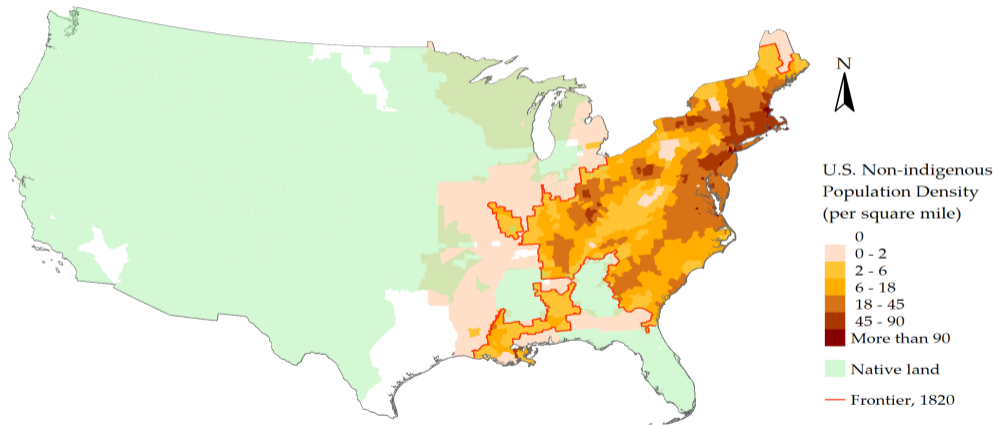
America's Westward Expansion

1810



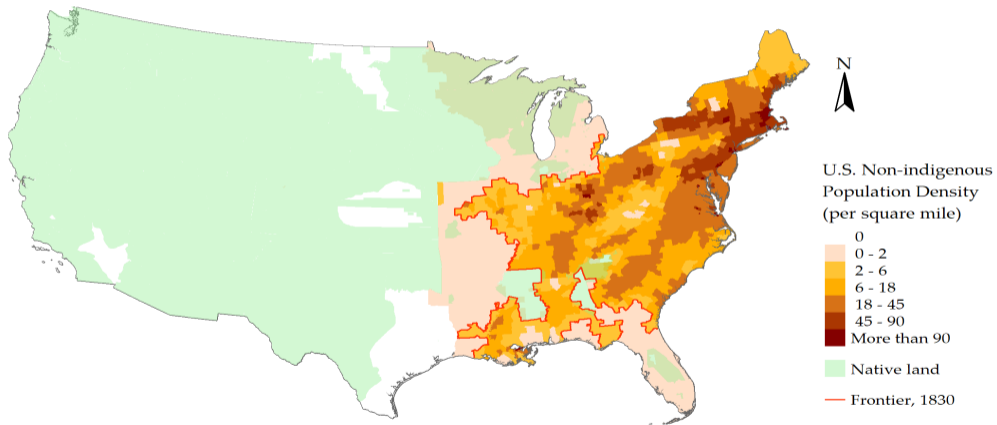
America's Westward Expansion

1820



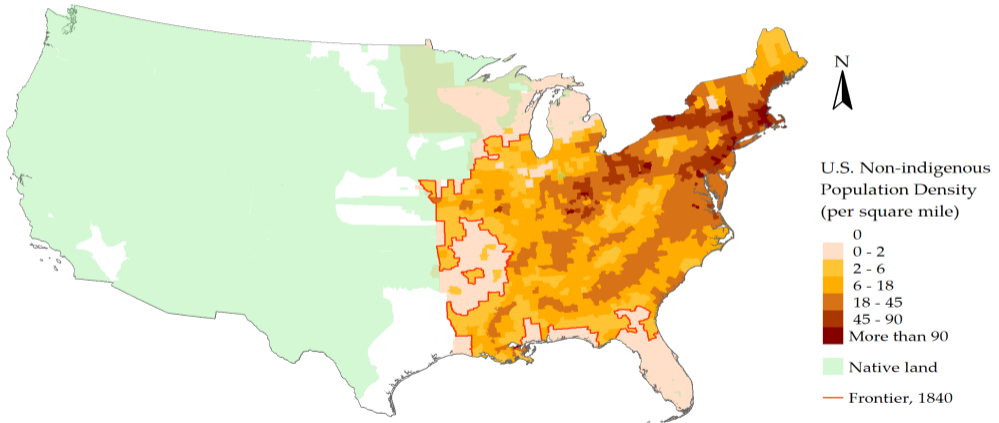
America's Westward Expansion

1830



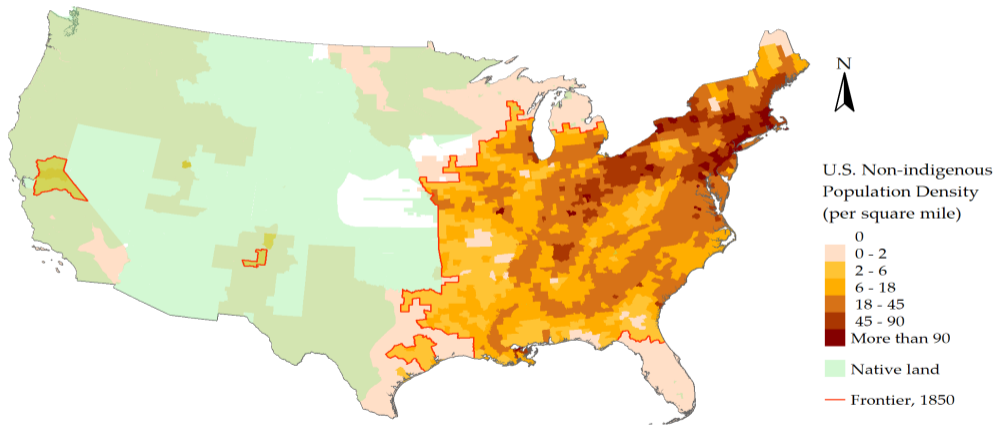
America's Westward Expansion

1840



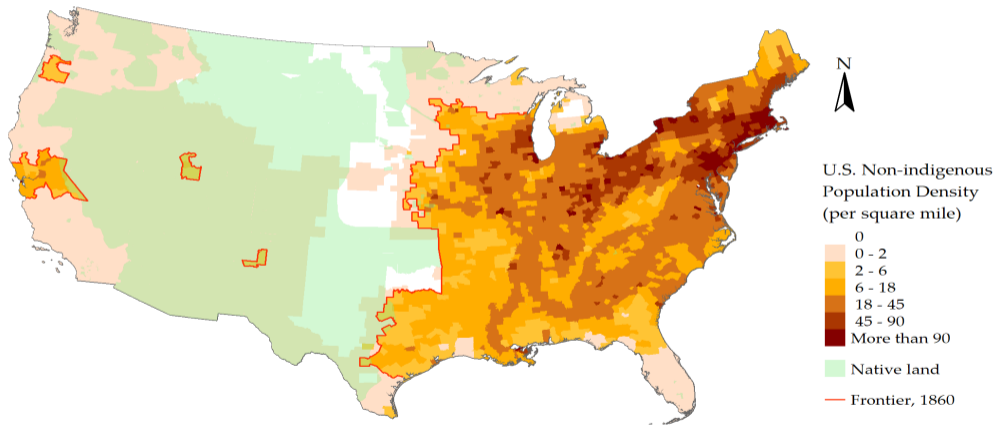
America's Westward Expansion

1850



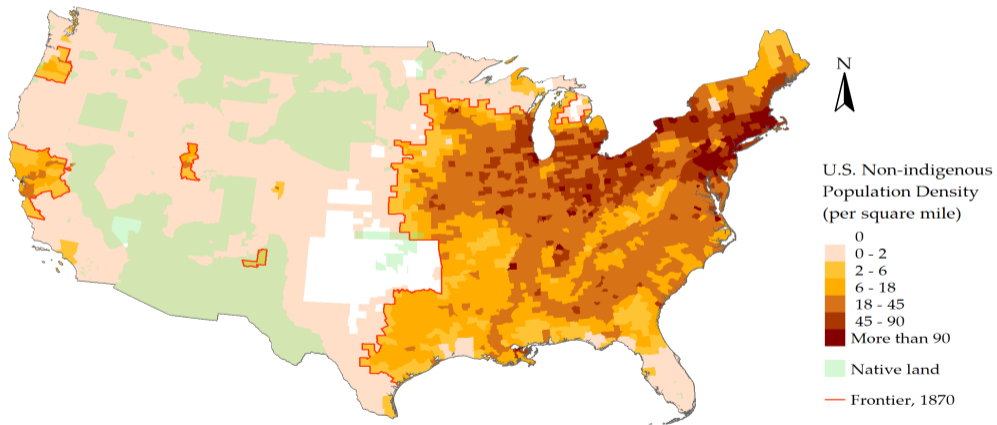
America's Westward Expansion

1860



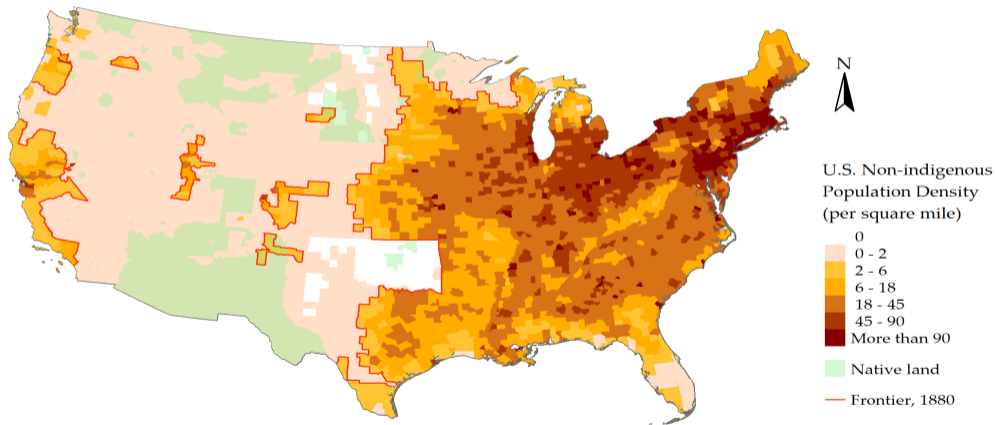
America's Westward Expansion

1870



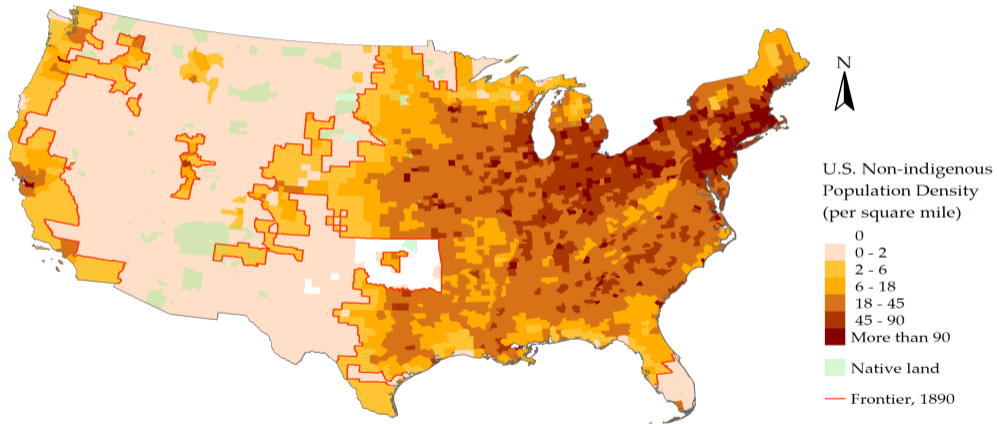
America's Westward Expansion

1880



America's Westward Expansion

1890



Mapping the Frontier

- ▶ **Locate frontier line and trace it over time**
 - ▶ contour line for population density of 2 people/mi²

Mapping the Frontier

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 - ▶ contour line for population density of 2 people/mi²
 - ▶ for intercensal years we interpolate population density

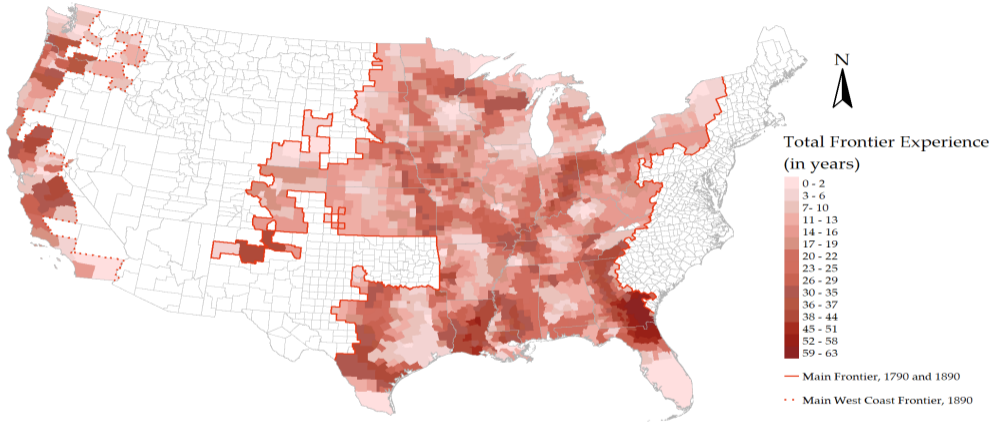
Mapping the Frontier

- ▶ **Locate frontier line and trace it over time**
 - ▶ contour line for population density of 2 people/mi²
 - ▶ for intercensal years we interpolate population density

- ▶ Define **frontier counties**: “margins of civilization” on “frontier belt”
 1. counties with centroid within 100 km
 2. population density < 6 people/mi² (Census cutoff for “fully settled”)

Mapping the Frontier

- ▶ **Locate frontier line and trace it over time**
 - ▶ contour line for population density of 2 people/mi²
 - ▶ for intercensal years we interpolate population density
- ▶ Define **frontier counties**: “margins of civilization” on “frontier belt”
 1. counties with centroid within 100 km
 2. population density < 6 people/mi² (Census cutoff for “fully settled”)
- ▶ **Measure of total frontier experience (TFE)**
 - ▶ total number of years spent on the frontier between 1790 and 1890

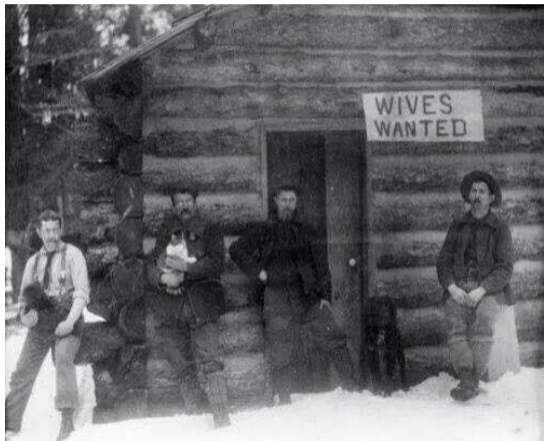


range of 0 to 63 years, mean of 18 years, std. dev. of 11 years

Images of Frontier Society



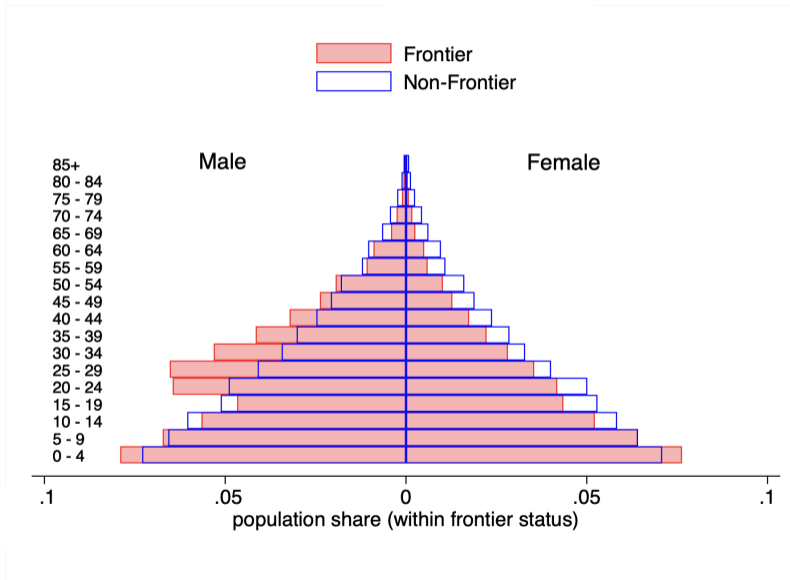
Images of Frontier Society



Images of Frontier Society



Frontier Demographics



Frontier conditions and gender roles: a view from family economics

- ▶ **Isolation** from extended family and social networks
 - ▶ most goods and services home-produced → increased domestic burden, esp. for women (Greenwood, Seshadri & Yorukoglu 2005; Cavalcanti & Tavares 2008)
 - ▶ lack of protection against violence or outside options (Figueredo et al 2001)
- ▶ **High fertility**

land abundance → high demand for children (Easterlin 1976, Steckel 1992; Ashraf & Galor 2010)

 - ▶ mortality implications, increased domestic burden, constraints on opportunities for labor market participation (Albanesi & Olivetti, 2016; Kleven, Landais & Sjøgaard 2019; Goldin, 2021)
- ▶ **Imbalanced sex ratios**
 - ▶ implications for labor supply and demand (e.g., Goldin 2006; Goldin and Olivetti, 2013)
 - ▶ favors female bargaining power → greater leisure (Grosjean & Khattar 2019)
 - ▶ favors masculinity norms, violence (Baranov, De Haas & Grosjean 2022)

Two historical narratives of gender roles on the frontier

1. Frontier women as **entrepreneurial, independent**

Economic necessity and labor scarcity → blurred gender roles, empowered women

*... by the demands it made on human beings for survival, **frontier economy established a certain rough egalitarianism** which challenged other, long-established concepts of propriety. (Flexner & Fitzpatrick, 1996)*

*Men and women generally had different roles to play, but the mutuality between the sexes enforced by **the needs of homesteading expanded women's power to negotiate and win.** (Harris, 1984)*

2. Frontier women as **home-bound**

Increased domestic burden, no empowerment → asymmetric erosion of gendered work

Even though frontier conditions forced them into manly pursuits and led them to modify some of their standards, they hardly pressed for a liberation from female norms and culture. Much of the 'freedom' which women experienced was the freedom to work even harder than they had before, with dramatic results" (Jeffrey, 1979)

Images of Frontier Society



Images of Frontier Society



Images of Frontier Society



Images of Frontier Society



Collecting buffalo dung for fuel, 1893



Images of Frontier Society



Marriage, Fertility, and Female Labor on the Frontier

$$x_{ct} = \alpha + \beta \text{frontier}_{ct} + \theta_{d(c)} + \theta_t + \varepsilon_{ct}$$

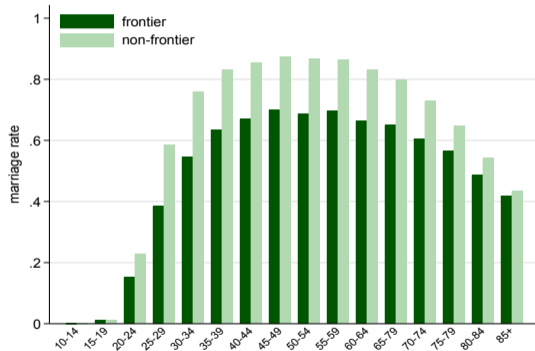
Marriage, Fertility, and Female Labor on the Frontier

$$x_{ct} = \alpha + \beta \text{frontier}_{ct} + \theta_{d(c)} + \theta_t + \varepsilon_{ct}$$

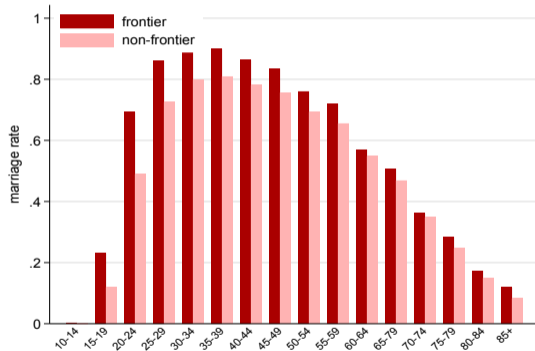
	Marriage Patterns			
	Share of Women Ever Married (1)	Share of Men Ever Married (2)	Age Gap Between Spouses (3)	Women's Divorce Rate (4)
Frontier	0.0491*** (0.005)	-0.0624*** (0.007)	0.239*** (0.066)	-0.0014*** (0.000)
Dep. Var. Mean (non-frontier)	0.70	0.58	4.36	0.004
Dep. Var. Std. Dev. (non-frontier)	0.04	0.05	2.02	0.003
Division Fixed Effects	✓	✓	✓	✓
Year Fixed Effects	✓	✓	✓	✓

Marriage Rates by Age

Men



Women



Fertility and Female Labor on the Frontier

- ▶ Fertility: proxied by child–women ratios: $\frac{\# \text{ children } 0-5}{\# \text{ women } 15-49}$
- ▶ Women's work
 - ▶ Rates of “gainful employment”
 - ▶ underestimates labor force participation due to unpaid family labor, social stigma (Goldin, 1990, 1995, 2006; Chiswick and Halenda Robinson, 2021; Burnette, 2021)
 - ▶ Occupational segregation gender (Duncan and Duncan): $\sum_o \left| \frac{F_o}{F} - \frac{M_o}{M} \right|$
 - ▶ Womens' occupational scores (IPUMS): based on 1950 income

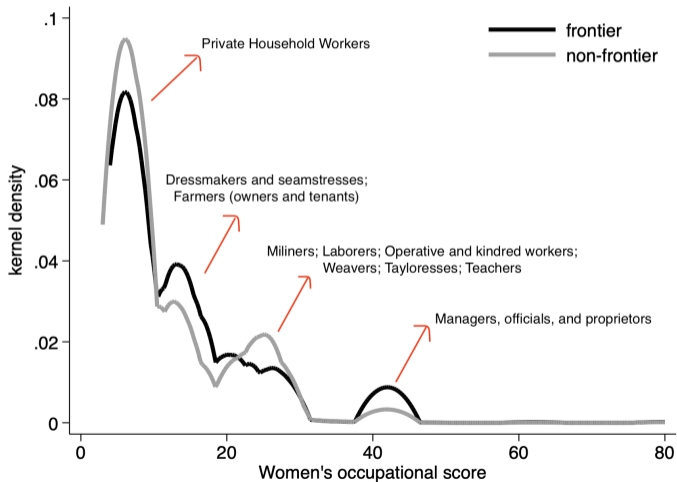
Fertility and Female Labor on the Frontier

$$x_{ct} = \alpha + \beta \text{ frontier}_{ct} + \theta_{d(c)} + \theta_t + \varepsilon_{ct}$$

	Family and Work				
	Child-Women Ratio (Fertility) (1)	Share of Households w/ Grandmother (2)	Female Gainful Employment (3)	Gender Occupational Segregation (4)	Womens' Occupational Score (5)
Frontier	68.67*** (11.289)	-0.0055*** (0.001)	-0.025*** (0.007)	0.030*** (0.010)	1.052*** (0.278)
Dep. Var. Mean (non-frontier)	671	0.018	0.12	0.82	12.6
Dep. Var. Std. Dev. (non-frontier)	119	0.006	0.13	0.22	2.92
Number of County-Years	6,048	5,844	4,905	4,818	4,795
Division Fixed Effects	✓	✓	✓	✓	✓
Year Fixed Effects	✓	✓	✓	✓	✓

An Upper Tail of Economically Empowered Women

Distribution of Occupational Scores, 1860



Estimating the Long-Run Legacy of TFE

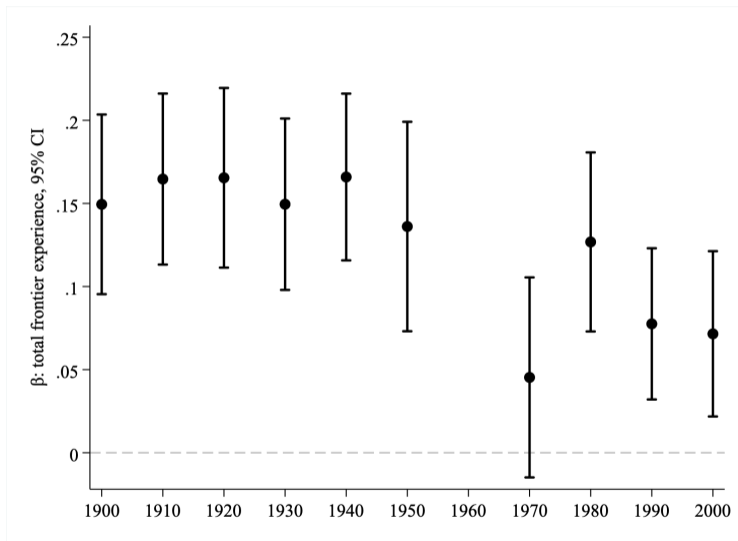
$$y_c = \alpha + \beta_t \text{ total frontier experience}_c + \mathbf{x}'_c \boldsymbol{\gamma} + \theta_{s(c)} + \varepsilon_c$$

- ▶ total frontier experience_c (TFE): number of decades on the frontier
- ▶ β : number of decades on the frontier
- ▶ \mathbf{x}_c : predetermined geographic and agroclimatic controls
(lat., long., area, temp., rain, distance to waterways, potential agri. prod., ...)
- ▶ $\theta_{s(c)}$: state fixed effects
- ▶ Clustered se's: 60 mi² grid; spatial HAC 100–1000 km; state

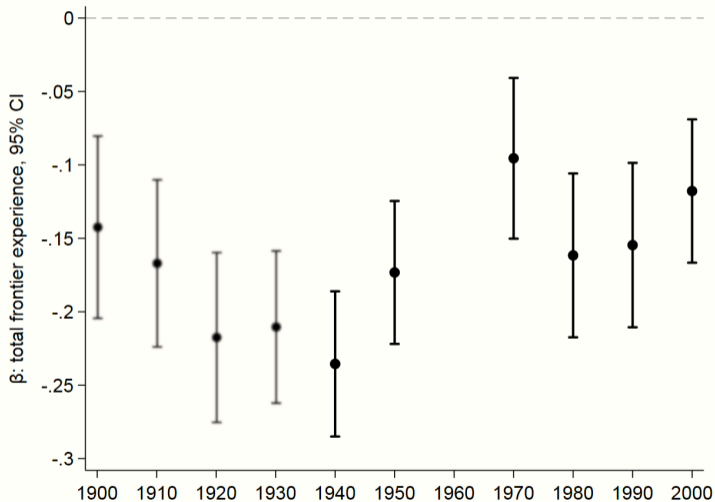
The Frontier Legacy of Gender Inequality in the Long Run

	Child-women Ratio (Fertility) (1)	Share Ever Married Female (2)	Share Ever Married Male (3)	Age Gap Spouses (4)	Female Labor Force Participation (5)	Gender Occupational Segregation (6)	Womens' Occupational Score (7)
(A) Outcomes Measured in 1940							
total frontier experience	13.131*** (2.019)	0.005*** (0.001)	0.002** (0.001)	0.059*** (0.013)	-0.015*** (0.002)	0.007*** (0.002)	0.099* 0.051
Dep. Var. Mean	375.70	0.78	0.69	4.44	0.17	0.71	18.04
Dep. Var. Std. Dev.	79.15	0.03	0.04	0.62	0.06	0.06	2.46
Number of Counties	2,032	2,032	2,032	1,987	2,033	2,032	2,032

The Frontier Legacy of Gender Inequality: Child-Women Ratios



The Frontier Legacy of Gender Inequality: Gainful Employment, FLFP



Robustness analysis

- ▶ Additional confounders ▶ Confounders ▶ Confounders All
- ▶ Alternative TFE definitions ▶ Alternative TFE
- ▶ Adding west coast and regional heterogeneity ▶ West
- ▶ Disentangling population density ▶ Population density
- ▶ IV approach ▶ IV

Conclusion

- ▶ Frontier conditions and gender roles
 - ▶ historically, women were more likely to marry, and did so earlier, with older men
 - ▶ higher fertility, less “gainful employment,” though with a thick upper tail occupational status)
 - ▶ seemingly conflicting historical narratives about women on the frontier are complementary
- ▶ Frontier history displays a lasting imprint on gender roles and norms
 - ▶ in the long-run: higher fertility, lower FLFP, but less leisure
 - ▶ conservative gender norms
 - ▶ weaker political participation
- ▶ What are the mechanisms for persistence?
 - ▶ social norms

Table A.3: Accounting for Additional Confounders of TFE and FLFP in 2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
total frontier experience	-0.0091*** (0.002)	-0.0093*** (0.002)	-0.0091*** (0.002)	-0.0095*** (0.002)	-0.0091*** (0.002)	-0.0086*** (0.002)	-0.0082*** (0.002)	-0.0085*** (0.002)	-0.0082*** (0.002)	-0.0081*** (0.002)	-0.0058*** (0.002)	-0.0093*** (0.002)	-0.0062*** (0.002)
Baseline controlling for...													
ruggedness		✓											✓
rainfall risk			✓										✓
distance to nearest portage site				✓									✓
distance to nearest mine					✓								✓
distance to nearest Indian battle						✓							✓
slave population share, 1860							✓						✓
immigrant share, 1890								✓					✓
Scottish and Irish immigrant share, 1890									✓				✓
birthplace diversity, 1890										✓			✓
years connected to railroad by 1890											✓		✓
manufacturing employment share, 1890												✓	✓
Dep. Var. Mean	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Dep. Var. Std. Dev.	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Number of Counties	1,815	1,815	1,815	1,815	1,815	1,815	1,815	1,815	1,815	1,815	1,815	1,815	1,815
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table adds further controls to the baseline specification in for FLFP in 2000 in column 4 of Panel B in Table 5. The sample size is slightly reduced due to missing data for some of the variables. Detailed descriptions of these controls can be found in [Bazzi et al. \(2020\)](#).

Table A.4: Accounting for Additional Confounders of TFE and FLFP in the 20th Century

	1900	1910	1920	1930	1940	1950	1970	1980	1990
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
total frontier experience	-0.00298 (0.003)	-0.00618** (0.003)	-0.00808*** (0.002)	-0.00852*** (0.002)	-0.00947*** (0.001)	-0.00664*** (0.001)	-0.00379** (0.002)	-0.00856*** (0.002)	-0.00810*** (0.002)
Dep. Var. Mean	0.16	0.23	0.17	0.18	0.18	0.22	0.36	0.44	0.51
Dep. Var. Std. Dev.	0.10	0.12	0.08	0.07	0.06	0.06	0.06	0.06	0.07
Number of Counties	1,700	1,726	1,757	1,772	1,814	1,814	1,814	1,815	1,815
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table repeats the specification in column 13 of Appendix Table A.3 for other years 1900 to 1990.

Table A.5: Alternative Measures of TFE and FLFP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
TFE: 100 km, $\leq 6/\text{mi}^2$, no inner or outer islands	-0.015*** (0.002)													
TFE: 50 km, $\leq 6/\text{mi}^2$, no inner or outer islands		-0.015*** (0.002)												
TFE: 100 km, $\leq 18/\text{mi}^2$, no inner island lines			-0.012*** (0.002)											
TFE: 50 km, $\leq 18/\text{mi}^2$, no inner island lines				-0.011*** (0.002)										
TFE: 100 km, 2-6/ mi^2 , no inner island lines					-0.013*** (0.003)									
TFE: 50 km, 2-6/ mi^2 , no inner island lines						-0.012*** (0.003)								
TFE: 100 km, no density restriction, no inner island lines							-0.007*** (0.002)							
TFE: 50 km, no density restriction, no inner island lines								-0.008*** (0.002)						
TFE: 100 km, $\leq 6/\text{mi}^2$, including inner island lines									-0.015*** (0.001)					
TFE: 50 km, $\leq 6/\text{mi}^2$, including inner island lines										-0.016*** (0.002)				
TFE: 100 km, $\leq 6/\text{mi}^2$, main single contour line											-0.013*** (0.002)			
TFE: 50 km, $\leq 6/\text{mi}^2$, main single contour line												-0.014*** (0.002)		
TFE: 50 km, $\leq 6/\text{mi}^2$, no inner or outer island lines													-0.015*** (0.002)	
TFE: 50 km, $\leq 6/\text{mi}^2$, no inner or outer island lines														-0.016*** (0.002)
Dep. Var. Mean	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Dep. Var. Std. Dev.	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Number of Counties	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports estimates of column 4 in Table 5 using alternative measures of total frontier experience, each of which are described at length in [Bazzi et al. \(2020\)](#).

Table A.6: Adding West Coast and Regional Heterogeneity

	Plus West Coast (1)	Midwest Only (2)	South Only (3)	West Only (4)
(A) Measurement of TFE from 1790 to 1890				
total frontier experience	-0.008*** (0.002)	-0.011*** (0.003)	-0.008*** (0.002)	-0.005 (0.005)
Dep. Var. Mean	0.54	0.58	0.50	0.56
Dep. Var. Std. Dev.	0.06	0.05	0.06	0.06
Number of Counties	2,140	987	935	152
(b) Measurement of TFE from 1790 to 1950				
total frontier experience	-0.007*** (0.001)	-0.011*** (0.003)	-0.007*** (0.002)	-0.005 (0.003)
Dep. Var. Mean	0.54	0.57	0.50	0.55
Dep. Var. Std. Dev.	0.06	0.05	0.05	0.06
Number of Counties	2,498	1,038	1,073	321
State Fixed Effects	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes

Notes: Using the FLFP outcome in column 4 of Table 5, this table extends our baseline sample of counties and examines region-by-region sample splits. Column 1 adds 105 counties along the secondary West Coast frontier (see Appendix Figure A.3). Column 2 restricts to counties in the Midwest Census region, column 3 restricts to the South region, and column 4 restricts to the West, which includes the 105 counties added in column 1 plus 47 others in states in the West region but falling inside the 1890 main east-to-west frontier line. Panel (A) uses our baseline measure of TFE. Panel (B) expands the column 1 sample to include counties beyond the (main and secondary) 1890 frontier lines but inside the eventual frontier line realized by 1950, using a new measure of TFE computed over that longer time horizon.

Table A.7: Disentangling Population Density

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
total frontier experience	-0.0015*** (0.0002)	-0.0014*** (0.0002)	-0.0009*** (0.0001)	-0.0009*** (0.0002)	-0.0009*** (0.0003)	-0.0011*** (0.0002)	-0.0011*** (0.0002)
low density experience							-0.0063*** (0.0011)
Contemporaneous Population Density		✓					
... Decile Within-State			✓				
Population Density-Neighbor Matching Within-State				✓			
Sample Restriction	None	None	None	None	> 90th percentile urban pop. share	≤ 90th	None
Dep. Var. Mean	0.17	0.17	0.17	0.17	0.26	0.16	0.17
Dep. Var. Std. Dev.	0.06	0.06	0.06	0.06	0.05	0.05	0.06
Number of Counties	2,033	2,033	2,019	2,033	241	1,792	2,033
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Using the FLFP outcome in column 4 of Table 5, this table explores robustness to the population density confound. Column (2) control for contemporaneous population density. Column (3) includes indicators for the decile of within-state population density. Column (4) implements a nearest-neighbor matching specification, including fixed effects within-state for pairs of counties that have the most similar population density. Columns (5) and (6) split the sample into counties above and below the 90th percentile of contemporaneous urban population shares. Column (7) controls for the total number of years that the county had population density less than 6 people/mi² from 1790–1890. This is one of the aspects of total frontier experience, the other being the total number of years that the county was within 100 km of the frontier line during that period.

Table A.15: Instrumental Variables (IV) Strategy: Core Outcomes

	Fertility Child-Women Ratio (1)	Female Labor Force Participation (2)	Gender Gap Labor Force Participation (3)	LSS Mean Summary Index (4)
Panel (A) IV = Log Average Actual National Migration Inflows Over 30 Years				
total frontier experience	11.562*** (3.413)	-0.016*** (0.003)	-0.019*** (0.004)	0.008** (0.004)
Number of Observations	2,032	2,033	2,033	25,763
Dep. Var. Mean	375.70	0.18	0.23	0.30
First-Stage F Statistic	188.64	188.23	188.23	31.52
Panel (B) IV = Log Average Predicted National Migration Inflows Over 30 Years				
total frontier experience	14.283*** (3.941)	-0.016*** (0.003)	-0.019*** (0.004)	0.007* (0.004)
Number of Observations	2,032	2,033	2,033	25,763
Dep. Var. Mean	375.70	0.18	0.23	0.30
First-Stage F Statistic	184.30	183.75	183.75	36.80
State Fixed Effects	Yes	Yes	Yes	Yes
Geographic controls	Yes	Yes	Yes	Yes
Survey Wave Fixed Effects				Yes
Individual Demographic Controls				Yes

Notes: 1940 Census data for columns (1) to (3).
Significance levels: * : 10% ** : 5% *** : 1%.