

The Politics Of Obsolescence:
Evidence from South Asia after the Industrial Revolution

Zuhad Hai
PhD Candidate
Stanford University

Creative Destruction in the World Economy

Creative Destruction in the World Economy



Old

New



Losers Mobilize Against Change



POLITICS

Joe Biden: Coal Is A Way Of Life

The Vice President fondly recalls his childhood in a Pennsylvania mining community.

AFP

For Poland's mining region, coal remains a way of life

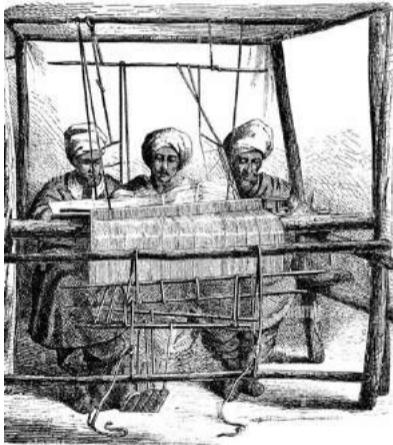
Climate change: Why India can't live without coal

© 28 September 2021

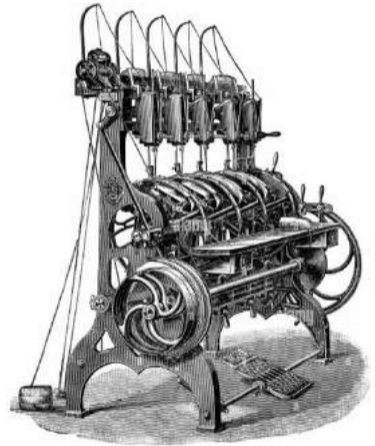
Research Question

- ▶ Does re-employment reduce political mobilization by the losers?
- ▶ **Conventional wisdom:** Yes
- ▶ **I find:** Not necessarily

Creative Destruction due to the Industrial Revolution

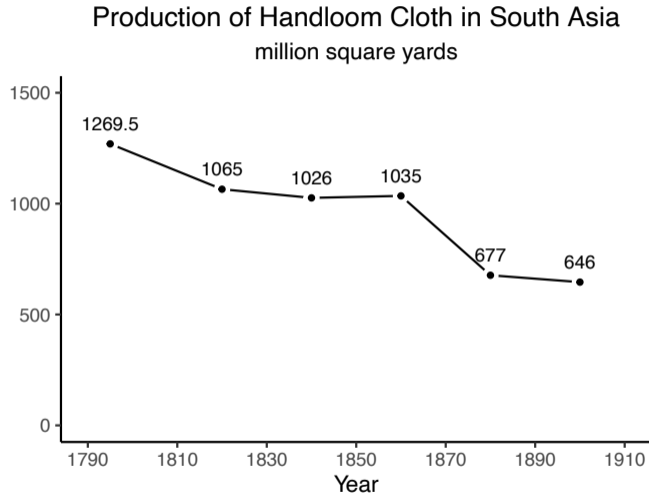


Old



New

South Asia Loses Comparative Advantage in Textiles



Source: Roy (2020)

Deindustrialization Animated 20th Century Politics

“The history of cotton and of textiles ... might be considered the history of India during the past one hundred years.”

- **Jawaharlal Nehru**

“Dead machinery must not be pitted against the millions of living machines represented by the villagers scattered in the seven hundred thousand villages of India.”

- **M.K. Gandhi**

... And Gains Comparative Advantage in Agriculture

- ▶ First era of globalization 1870-1914:
 - ▶ Massive drop in global transportation costs
 - ▶ Railroads connecting inland areas to international ports
- ▶ South Asia's comparative advantage shifts to export agriculture
- ▶ Mass adjustment of skilled artisans into agriculture in some regions

Beckert (2015)

Technological Δ in Britain



Δ World Prices



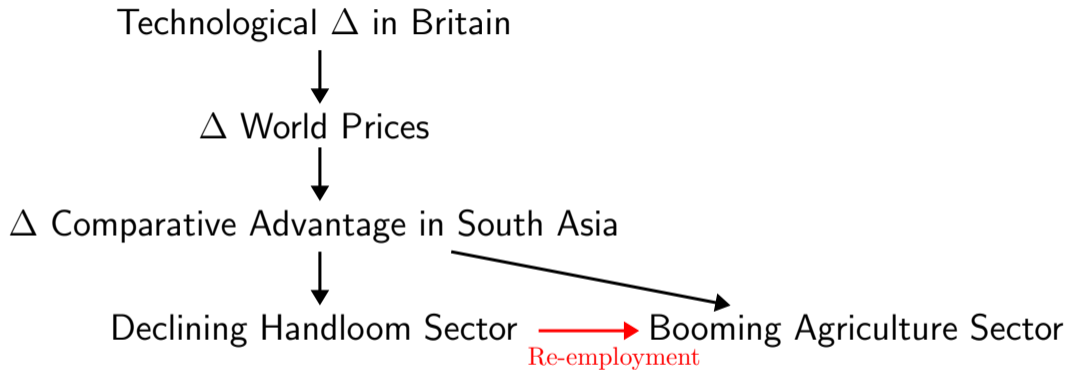
Δ Comparative Advantage in South Asia



Declining Handloom Sector



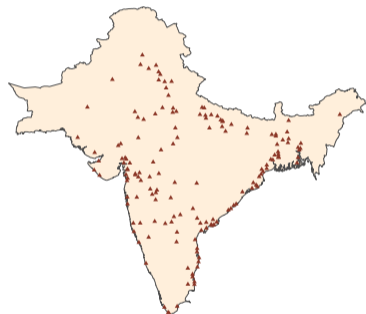
Booming Agriculture Sector



Did the opportunity to adjust to agriculture reduce political mobilization by losers?

Unit of Analysis: Weaving Towns in South Asia

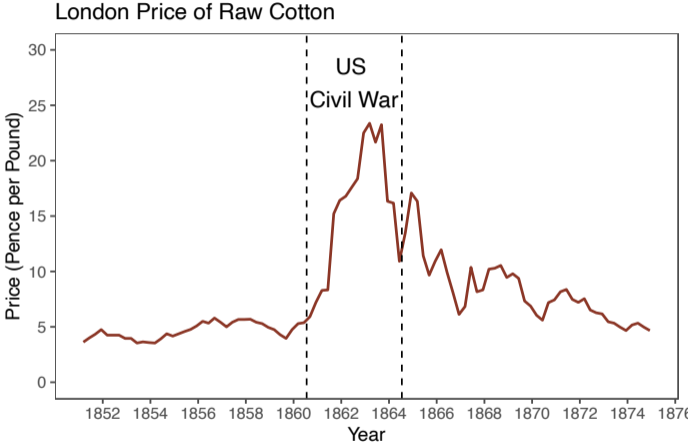
- ▶ Dataset of 371 historical weaving towns
- ▶ Specialized in handloom weaving in 1500-1800
- ▶ Up to half of residents connected to weaving industry
(Haynes, 2012)
- ▶ In constant decline throughout 19th century
(Bagchi, 2010)



Empirical Strategy

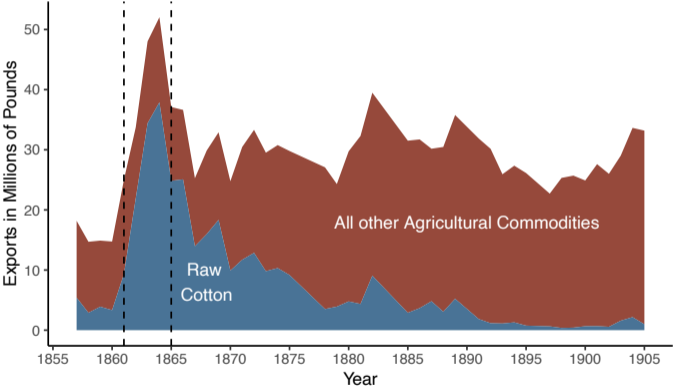
- ▶ Does opportunity to adjust reduce political organization in weaving towns?
- ▶ Need town-level measures of:
 - ▶ **Explanatory Variable:** Opportunity to adjust
 - ▶ **Dependent Variable:** Support for protectionism

Opportunity to Adjust to Agriculture

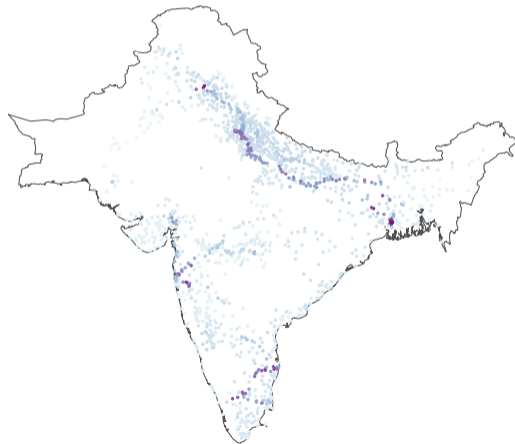
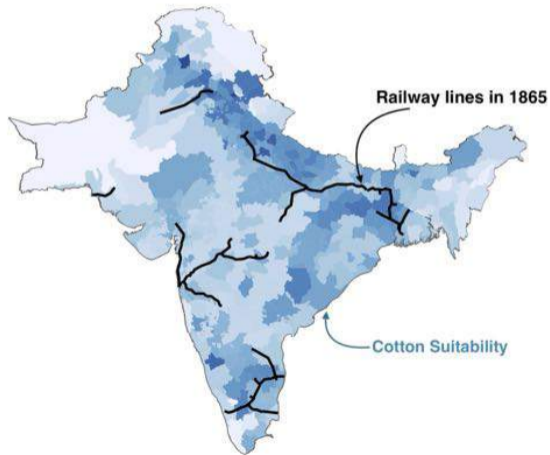


Large-Scale Transition to Agriculture in South Asia

South Asian Exports to Britain 1857-1905



$$OpportunitytoAdjust_i = \underbrace{\sum_{t=1857}^{1875} \left(\frac{CottonExports_t}{TradeCost_{it}} \right)}_{\text{Railway During Cotton Boom}} * CottonSuitability_i$$



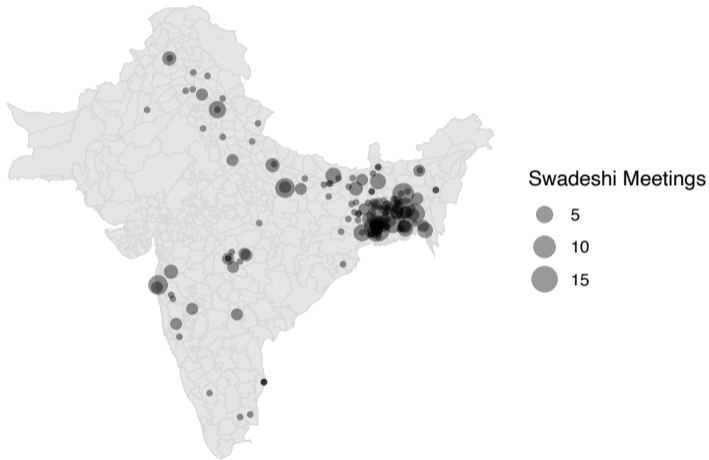
Dependent Variable: *Swadeshi* Movement

- ▶ Earliest manifestation of mass economic nationalism
- ▶ Anti-British boycott movement sparked by the partition of Bengal in 1905
- ▶ Combined protectionism with anti-imperialism
- ▶ Had a lasting effect on anti-colonial movement and post-independence economic policy



▶ Example of Protectionism

Dependent Variable: *Swadeshi* Events



Estimating Equation

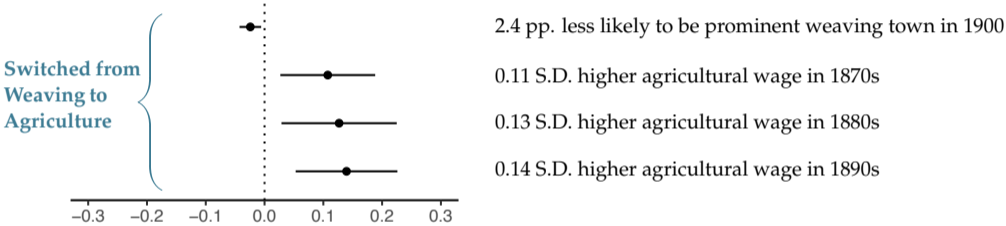
$$\underbrace{Y_i}_{\text{Support for Protectionism}} = \beta_0 + \beta_1 \text{OpportunitytoAdjust}_i + \alpha \underbrace{X_i}_{\text{Controls}} + \underbrace{\gamma_{p(i)}}_{\text{Province FE}} + \epsilon_i$$

► **Controls:**

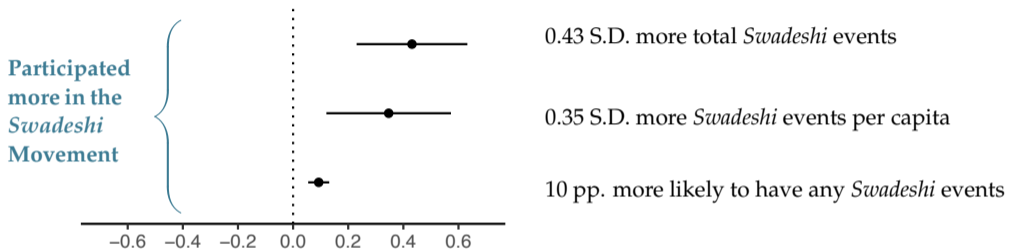
Log population (1901), Cotton suitability, Trade cost (1855,1900), % Muslim (1901), latitude, longitude, and town pop >100k (1901)

- Reduced-form effect of the opportunity to adjust
- Standard errors clustered at district level

Weaving Towns with One SD Higher Opportunity to Adjust...



Weaving Towns with One SD Higher Opportunity to Adjust...



▶ Alt. Collective Action

▶ Alt. Import Comp

▶ Alt. Famine

Opportunity to Adjust to Agriculture:

- ▶ Enriched declining weaving communities
- ▶ Yet they were more supportive of protectionism

Opportunity to Adjust to Agriculture:

- ▶ Enriched declining weaving communities
- ▶ Yet they were more supportive of protectionism
- ▶ Why?

Possible Explanations

- ▶ Adjustment to agriculture may have enriched weaving communities
- ▶ BUT it may also have:
 - ▶ Reduced the social status of weaving
(Shayo, 2009; Rodrik, 2021; Baccini and Weymouth, 2021; Abramson and Shayo, 2022)
 - ▶ Empowered landed elites at the expense of weavers
(Banerjee and Iyer, 2005; Lee, 2019)
- ▶ Easier to mobilize around sense of lost social status and power

Possible Explanations

- ▶ Reduced social status of weaving
 - ⇒ Larger effect in regions with more caste-based weaving
- ▶ Empowered landed elites at the expense of weavers
 - ⇒ Larger effect in regions with landlord tenure

What Have We Learned?

- ▶ **Conventional wisdom:**
Opportunity to adjust reduces political mobilization by the losers
- ▶ **I find:**
Weaving communities that had the opportunity to adjust were more likely to politically organize
- ▶ Suggestive evidence of attachments to declining industry based in:
 - ▶ Social status
 - ▶ Political power

Implications for the Politics of Adjustment

- ▶ Need more systematic testing of the conventional wisdom on adjustment
 - ▶ Outside the developed world
 - ▶ Different time periods
- ▶ Re-orient research agenda on adjustment:
 - ▶ Social and political institutions can mediate adjustment to technology

Thank You
zuhadhai@stanford.edu
zuhadhai.com

Supplementary Slides

Conventional Wisdom

- ▶ Example of Protectionism
- ▶ Obsolescence Details
- ▶ Other Examples

Research Design

- ▶ Measure Validity
- ▶ Suitability Railway Interaction

- ▶ Exports of Raw Cotton
- ▶ Trade Costs Details

Results

- ▶ IV Interpretation of Results
- ▶ Effect on Non-Cooperation Movement

Mechanisms

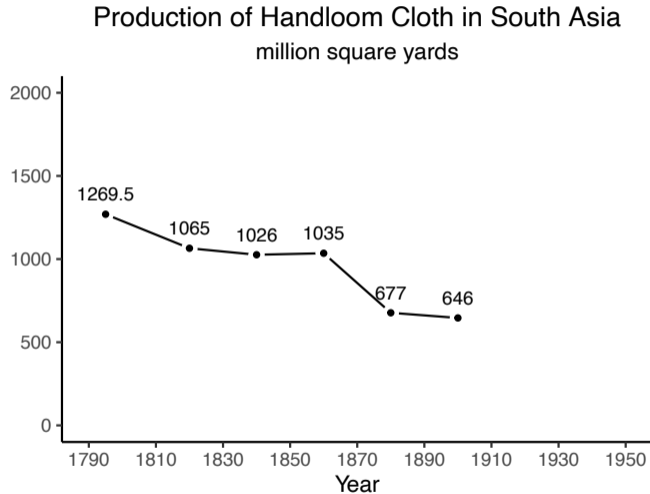
- ▶ List of Weaver Castes
- ▶ Identity Table
- ▶ Alternative Identity HTE
- ▶ Zamindari Table

Additional Slides

- ▶ Rationality
- ▶ Unit of Analysis
- ▶ New Entrants
- ▶ Role of Elites
- ▶ Role of Technology

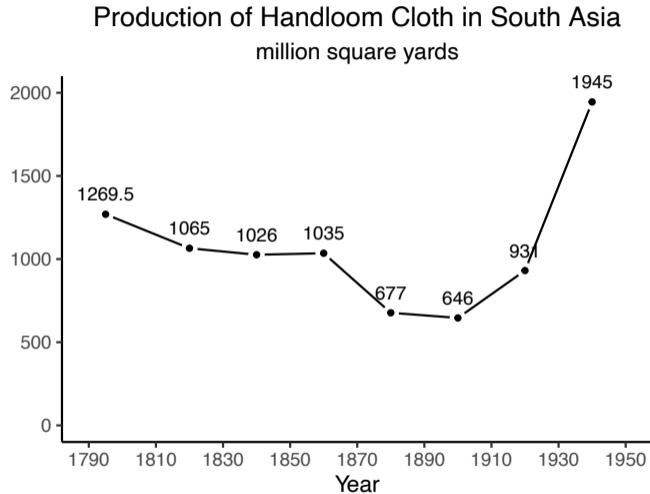
- ▶ Driven by Landed Elites
- ▶ Income Effects
- ▶ Non-Weaving Towns
- ▶ Outside Bengal
- ▶ Effect of Mission

An Obsolete Industry?



Source: Roy (2020)

An Obsolete Industry?



Source: Roy (2020)

The Tragedy of Indian Economic Policy

- ▶ Handloom weaving largest industrial employer up until 1985 (Roy, 2020)
- ▶ Strong protection and subsidies for the handloom-based textile sector
- ▶ Post-Independence India had some of the highest trade barriers in the world
 - ▶ 91.5% average tariff on textile goods in 1990 (WITS, 2018)

Are Results Driven by Higher Collective Action Capacity?

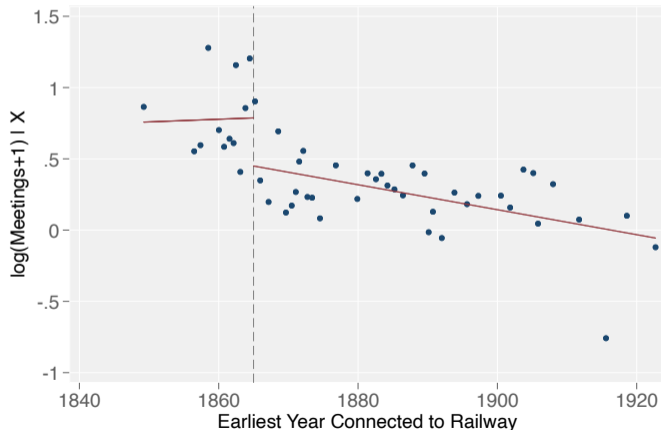
- ▶ No effect on participation in 1857 Mutiny

	Dependent variable: Participated in 1857 Mutiny?
	(1)
Opportunity to Adjust	-0.015 (0.010)
Num.Obs.	360
# Districts	115
DV Mean	0.08
Controls?	✓
Province FE?	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Are Results Driven by Import Competition?

- ▶ Control for trade costs 1850-1900
- ▶ Timing of railway access matters:



Are Results Driven by Lower Long-Term Income?

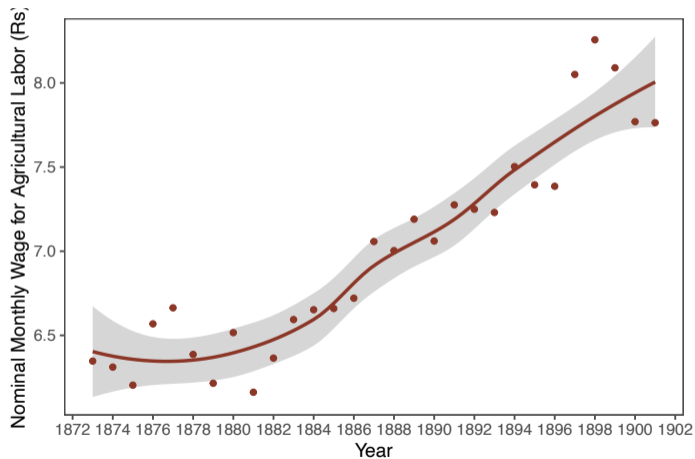
- ▶ No relationship with famine incidence:

	Dependent variable:
	Percentage Change in Town Population 1871-1901
	(1)
Opportunity to Adjust	0.024 (0.022)
Num.Obs.	301
# Districts	115
DV Mean	0.25
Controls?	✓
Province FE?	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Are Results Driven by Lower Long-Term Income?

- ▶ Rising agricultural wages 1870-1900



Is it rational to adjust but still protest?

- ▶ Weaving communities' behavior consistent with rationality if:
 - ▶ Individually rational for weavers to abandon weaving for agriculture
 - ▶ Social status and power are aggregate variables unaffected by individual movements but are affected by mass movements out of weaving

▶ Supplementary Slides

Ecological Inference

- ▶ Unit of analysis is the weaving community, not only weavers
- ▶ *Swadeshi* events featured a wide swathe of the community
- ▶ I assume residents form preferences over policy sociotropically
- ▶ This assumption less tenable for landed elites
 - ▶ Movement not driven by powerful landed elites
 - ▶ *Zamindars* often singled out as anti-India by Congress

▶ Supplementary Slides

Results Driven by Existing vs New Entrants?

- ▶ Protectionism for cloth will reduce real agricultural income
- ▶ There are new entrants because supply of labor has not kept up with demand for labor → higher agricultural wages

▶ Supplementary Slides

Role of Political Elites?

- ▶ *Swadeshi* movement decentralized relative to later non-cooperation movement
- ▶ Leaders include “moderates” like Gopal Krishna Gokhale and “extremists” like Bal Gangadhar Tilak
- ▶ Congress in weak stage of organization

▶ Supplementary Slides

Swadeshi Movement as Protectionism

*“The whole ‘white portion’ of the British Empire, in short, is for Protection, **but when we poor Indians adopt a rough and ready method of Protection** the shout of sedition is raised! Russia is protectionist, Germany is protectionist, France is protectionist; all the free and self-governing nations are protectionist. But Indians, because they are voiceless and helpless, must be Free Traders and must be tied to the wheels of the Juggernaut car of Lancashire!”*

- The Tribune (Lahore), 21st September 1905

▶ Back

▶ Supplementary Slides

Example of a Swadeshi Event

Kushtia, Oct. 1.

The recent monster meeting that was inaugurated here on the 18th September last under the presidency of Babu Surendra Nath Tagore of the Calcutta Jorasanko Tagore family, was admitted on all hands to be a grand success and the fact that it was one of the largest and grandest meetings ever held in India in connection with the present movement was also noticed in several leading journals. The movement has been spreading like wild fire in the remotest villages and has penetrated into the masses including cultivators, weavers and shopkeepers in fact all sections of the community very intensely. The only topic of the day

Technology Creates *Global* Obsolescence

- ▶ Mexico:

- ▶ “[I]n the capital of Oaxaca, where once 500 looms had clattered in the production of cotton cloth, a mere 50 were working in 1827”

González et al. (2008)

- ▶ Ottoman Empire:

- ▶ “Damascus was estimated to have had 34,000 handlooms in the eighteenth century, while the numbers ... averaged 2,355 between 1838 and 1850”

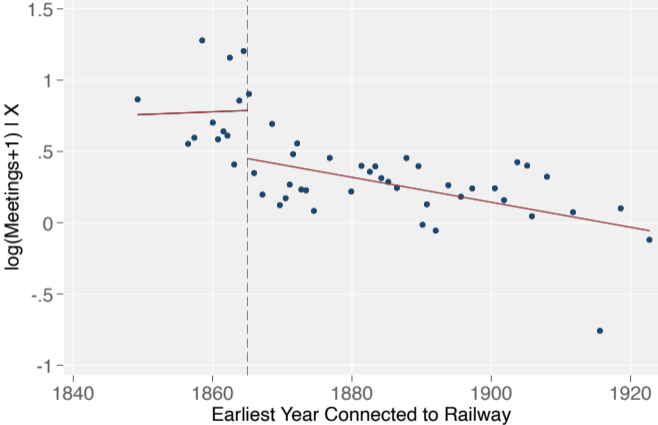
Pamuk and Williamson (2011)

- ▶ South Asia:

- ▶ “The bones of the cotton-weavers are bleaching the plains of India”

Marx (1867)

The Timing of Railway Access Matters



▶ Back

▶ Supplementary Slides

Interaction Between Suitability and Railways in 1865

	Dependent variable:		
	log(Num. Swadeshi Meetings+1)		
	(1)	(2)	(3)
Suitability X Railway1865			0.372** (0.089)
Suitability	0.148* (0.044)	0.130* (0.040)	0.032 (0.035)
Railway1865		0.495*** (0.080)	-0.310 (0.197)
Num.Obs.	360	360	360
R2	0.531	0.596	0.631
R2 Adj.	0.513	0.579	0.615
Controls?	✓	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Non-Cooperation Movement Results

	Dependent variable:		
	log(Non-Coop Meetings+1)	Non-Coop Meetings per 1000	Any Non-Coop
	(1)	(2)	(3)
Opportunity to Adjust	0.241*** (0.023)	0.076*** (0.019)	0.102*** (0.013)
Num.Obs.	360	360	360
R2	0.602	0.389	0.407
R2 Adj.	0.586	0.364	0.383
Controls?	✓	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

▶ Back

▶ Supplementary Slides

Instrumental Variable Results

First stage F-Statistic = 9.08 ($p = 0.0032$)

	Dependent variable:			
	Still Weaving in 1900	log(Events+1)	Any Events?	Events per 1000 People
	First Stage	Second Stage		
	(1)	(2)	(3)	(4)
Opportunity to Adjust	-0.023** (0.009)			
Still Weaving		-8.515** (3.664)	-4.300* (2.273)	-2.912* (1.539)
Num.Obs.	360	360	360	360
# Districts	108	108	108	108
Controls?	✓	✓	✓	✓
Province FE?	✓	✓	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

▶ Back

▶ Supplementary Slides

Are Results Driven by Landed elites?

- ▶ Landlord districts no more likely to participate

	Dependent variable:		
	log(Events+1)	Events per 1000 People	Any Event?
	(1)	(2)	(3)
Landlord Tenure	-0.076 (0.072)	-0.032 (0.033)	-0.053 (0.063)
Num.Obs.	809	809	809
# Districts	258	258	258
DV Mean	0.14	0.04	0.11
Controls?	✓	✓	✓
Province FE?	✓	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Are Richer Places More Protectionist?

	Dependent variable:		
	log(Swadeshi Meetings+1)		
	(1)	(2)	(3)
US Civil War Shock	0.198*** (0.024)		0.201*** (0.026)
log(Agr. Wage) in 1890s		0.829** (0.282)	-0.118 (0.243)
Num.Obs.	360	355	355
R2	0.658	0.530	0.658
R2 Adj.	0.645	0.513	0.645
Controls?	✓	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

► Supplementary Slides

Tabular Version: Identity Mechanism

	Dependent variable:	
	log(Events+1)	Prominent Weaving Town in 1900?
	(1)	(2)
Opportunity to Adjust X Weaver Caste per Capita	0.022*** (0.003)	0.002** (0.001)
Opportunity to Adjust	0.178** (0.076)	-0.092*** (0.028)
Weaver Caste per Capita	-0.005*** (0.002)	0.003** (0.001)
Num.Obs.	342	342
# Districts	115	115
DV Mean	0.33	0.06
Controls?	✓	✓
Province FE?	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Tabular Version: Institutional Power Mechanism

	Dependent variable:	
	log(Events+1)	Prominent Weaving Town in 1900?
	(1)	(2)
Opportunity to Adjust X Landlord Tenure	0.598*** (0.131)	-0.039 (0.068)
Opportunity to Adjust	0.139*** (0.053)	-0.021* (0.011)
Landlord Tenure	-0.128** (0.053)	-0.003 (0.027)
Num.Obs.	232	232
# Districts	115	115
DV Mean	0.33	0.06
Controls?	✓	✓
Province FE?	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Main Results for Non-Weaving Towns

- ▶ 7% of Non-Weaving Towns have an event (compared to 22% of Weaving Towns)
- ▶ 0.02 meetings per capita in Non-Weaving Towns (0.09 in Weaving Towns)

	Dependent variable:		
	log(Events+1)	Events per 1000	Any Event?
	(1)	(2)	(3)
Opportunity to Adjust	0.131 (0.073)	0.024 (0.029)	0.073* (0.033)
Num.Obs.	1033	1033	1033
R2	0.263	0.058	0.273
R2 Adj.	0.254	0.046	0.264
Controls?	✓	✓	✓

* p < 0.1, ** p < 0.05, *** p < 0.01

Comparing Weaving vs Non-Weaving Towns

	Dependent variable:		
	log(Swadeshi Meetings+1)	Swadeshi Meetings per 1000	Any Meeting?
	(1)	(2)	(3)
Weaving Town?	0.135*** (0.027)	0.046** (0.013)	0.072*** (0.019)
Num.Obs.	1393	1393	1393
R2	0.376	0.157	0.362
R2 Adj.	0.370	0.149	0.356
Controls?	✓	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

► Supplementary Slides

Main Results within and Outside Bengal

	Dependent variable: log(Swadeshi Events+1)		
	All Weaving Towns	Bengal Only	Outside Bengal
	(1)	(2)	(3)
Opportunity to Adjust	0.198*** (0.024)	0.304*** (0.068)	0.138*** (0.026)
Num.Obs.	360	69	291
R2	0.658	0.626	0.443
R2 Adj.	0.645	0.576	0.419
Controls?	✓	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Alternative HTE: Identity Mechanism

$$\text{Caste Obsolescence}_i = \sum_{k \in K} s_{k,p(i)} m_{ik}$$

- ▶ K is the set of weaver castes in British India
- ▶ m_{ik} is the proportion of district i 's population that belongs to caste k
- ▶ $s_{k,p(i)}$ is the proportion of active working members of caste k in district i 's province $p(i)$ that work in a profession other than textiles.

▶ Back

▶ Supplementary Slides

Alternative HTE: Identity Mechanism

	Dependent variable:	
	log(Events+1)	Prominent Weaving Town in 1900?
	(1)	(2)
Opportunity to Adjust X Caste Obsolescence	0.031*** (0.006)	-0.004*** (0.001)
Opportunity to Adjust	0.121** (0.052)	-0.012 (0.010)
Caste Obsolescence	0.001 (0.007)	-0.001 (0.004)
Num.Obs.	360	360
# Districts	115	115
DV Mean	0.33	0.06
Controls?	✓	✓
Province FE?	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

► Back

► Supplementary Slides

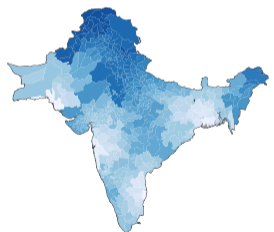
List of Weaver Castes

Table: Castes Historically Specialized in Handloom Weaving

Caste Name	Provinces where Found
Balahi	Central Provinces & Berar
Bhulia	Central Provinces & Berar
Chik	Bengal
Devanga	Madras
Jolaha	Bombay, Bengal, United Provinces & Oudh, Madras, Punjab
Jugi	Bengal
Kaikolan	Madras
Kosti	Bombay, Madras, Central Provinces & Berar
Kori	United Provinces & Oudh, Central Provinces & Berar
Khatri	Madras
Mallik	Bengal
Momin	Bombay
Mehra	Central Provinces & Berar
Pattunulkaran	Madras
Pan	Bengal
Panka	Central Provinces & Berar
Sali/Padmasali	Bombay, Madras
Tanti	Bengal

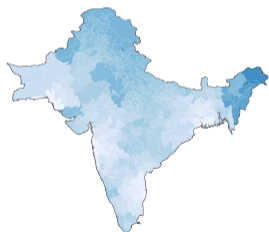
Trade Cost Calculation

- ▶ Step 1: convert railway network at year t into network with nodes being towns
- ▶ Step 2: Use Dijkstra's algorithm to calculate D_{it} length (kms) of shortest path between town i and closest port $\in \{Karachi, Bombay, Madras, Calcutta\}$
 - ▶ Weight edges by 1 if railroad, 2.375 if non-railroad (from Donaldson (2018))
- ▶ Step 3: Calculate percentile of trade cost $q(D_{it})$



Effective Distance to Port (kms) 0 800 1600

1855



Effective Distance to Port (kms) 0 800 1600

1900

▶ Back

▶ Supplementary Slides

Effect of Basel Mission in Town

	Dependent variable:	
	log(Meetings+1)	Still Weaving in 1900
	(1)	(2)
Basel Mission	-0.222* (0.124)	0.101* (0.055)
Any Protestant Mission	0.327*** (0.091)	-0.075** (0.030)
Num.Obs.	360	360
# Districts	115	115
DV Mean	0.33	0.22
Controls?	✓	✓
Province FE?	✓	✓

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

► Supplementary Slides

References

- Tirthankar Roy. *The crafts and capitalism: handloom weaving industry in colonial India*. Taylor & Francis, 2020.
- Sven Beckert. *Empire of cotton: A global history*. Vintage, 2015.
- Douglas E Haynes. *Small town capitalism in Western India: artisans, merchants, and the making of the informal economy, 1870-1960*. Number 20. Cambridge University Press, 2012.
- Amiya Bagchi. *Colonialism and the Indian Economy*. Oxford University Press, 2010.
- Moses Shayo. A model of social identity with an application to political economy: Nation, class, and redistribution. *American Political science review*, 103(2):147–174, 2009.
- Dani Rodrik. Why does globalization fuel populism? economics, culture, and the rise of right-wing populism. *Annual Review of Economics*, 13:133–170, 2021.
- Leonardo Baccini and Stephen Weymouth. Gone for good: Deindustrialization, white voter backlash, and us presidential voting. *American Political Science Review*, 115(2): 550–567, 2021.
- Boaz Abramson and Moses Shayo. International integration and social identity. *Journal of International Economics*, 137:103577, 2022.
- Abhijit Banerjee and Lakshmi Iyer. History, institutions, and economic performance: The legacy of colonial land tenure systems in india. *American economic review*, 95(4): 1190–1213, 2005.
- Alexander Lee. Land, state capacity, and colonialism: Evidence from india. *Comparative Political Studies*, 52(3):412–444, 2019.
- WITS. World integrated trade solution, 2018.
- Rafael Dobado González, Aurora Gomez Galvarriato, and Jeffrey G Williamson. Mexican exceptionalism: Globalization and de-industrialization, 1750–1877. *The Journal of Economic History*, 68(3):758–811, 2008.
- Şevket Pamuk and Jeffrey G Williamson. Ottoman de-industrialization, 1800–1913: assessing the magnitude, impact, and response. *The Economic History Review*, 64:159–184, 2011.
- Karl Marx. *Capital: A Critique of Political Economy*, volume I. Verlag von Otto Meisner, 1867.