Latest version: Review of Economics and Statistics, Vol. 96, No. 4 (October 2014), pp. 596-608

THE LEGACIES OF FORCED FREEDOM: CHINA'S TREATY PORTS

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2011

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Apr. 6th. 2019

Contents

Introduction

- Treaty ports system 通商口岸

Whether history matters: the opening can be taken as an exogenous shock

Why history matters: phases of closedness and openness from the 19th century until today

- History of treaty ports

Dated back to Qing dynasty, unequal treaties

40 cities called "treaty ports" from the 1840s to the 1910s

Obviously, treaty ports have developed better: like Shanghai, Guangzhou and Tianjin

Introduction

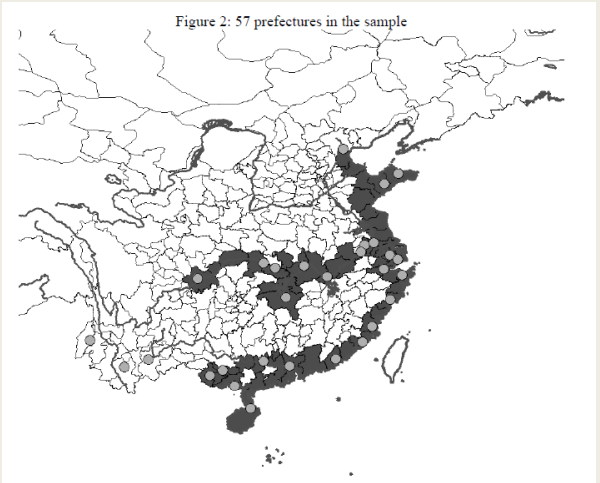
- This paper

Four phases of closedness and openness: the period before 1842, 1842-1949, 1949-early 1980s, and the 1980s until today,

57 prefectures along the coast or along the Yangtze River

differences-in-differences model

Custom stations(常关) as instrumental variables



- Main results

prefectures with treaty ports developed better earlier in history

the development advantage was very much restricted during the closed period between 1949 and 1978

the treaty ports group once more diverged from the control group after the 1978,

due to human capital and social norms as legacies.

Historical background

- 1842: from closedness to forced openness

After the First Opium War, The treaty of Nanking, Five treaty ports: Canton (Guangzhou), Amoy (Xiamen), Fuchow (Fuzhou), Ningpo (Ningbo) and Shanghai

- 1949 - 1978: from openness to closedness

The closed economy led to significant economic stagnation.

- 1980s - today: from closedness to openness

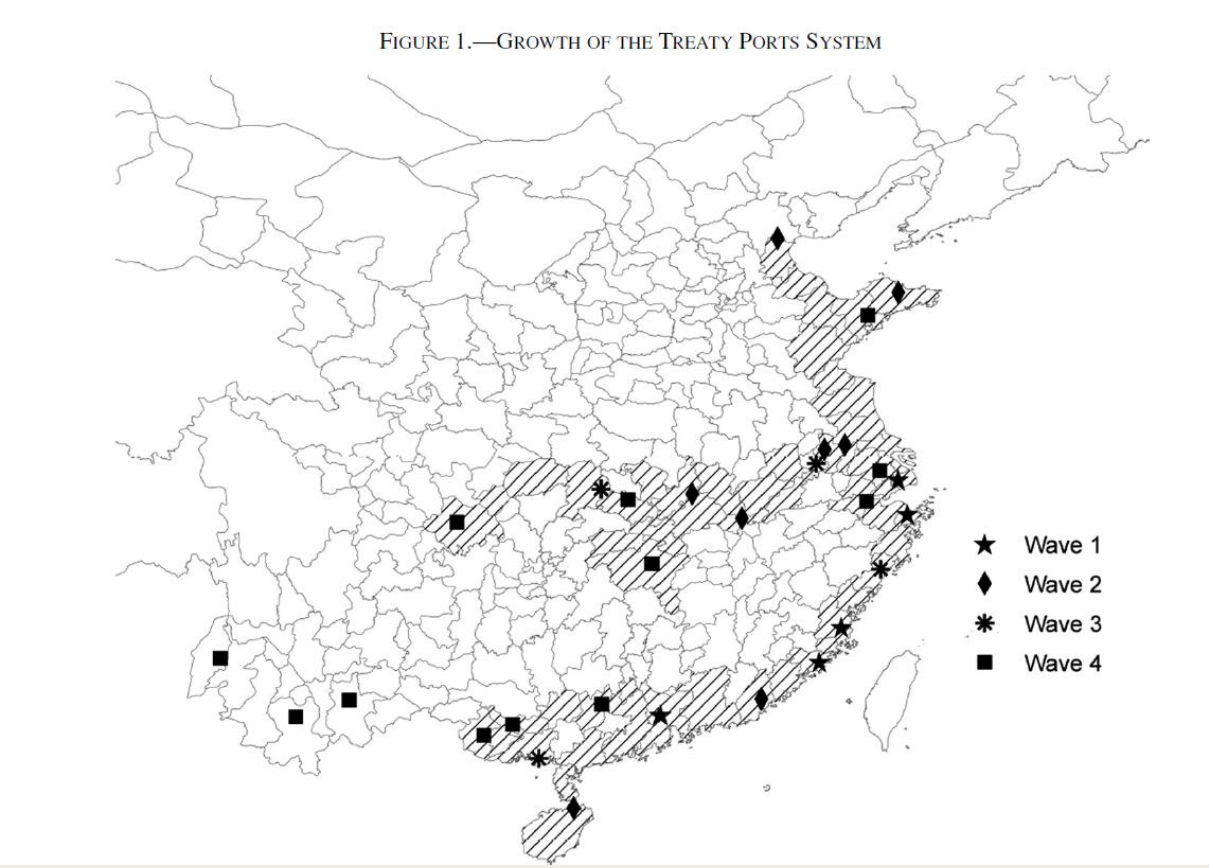
Since 1980, China has established Special Economic Zones in Shenzhen, Zhuhai, Shantou, Xiamen the entire province of Hainan.

Historical background

- Selection of treaty ports

focus on 57 prefectures on the coastal line and the Yangtze River in the identification

check whether the prefectures with treaty ports differ from the control group before the treaty port system



Data

- Population sizes in the year 1776, 1820, 1851, 1880, 1910, 1953, 1964, 1982, 1990 and 2000

- Prefecture characteristics

Geographical variables: Dummies for whether a prefecture is on the coastal line and the Yangtze River

Economic variables: Population

Natural resources: Dummies for silk and tea production areas

Political variables: Distance to the Grand Canal. The Grand Canal system totaled about 2,500 kilometers.

connected the political center of the empire in the with the economic and agricultural centers of central and southern China.

The Grand Canal is a significant element in imperial China’s political stability,

Table 1: Selection of treaty ports

	Geographical features	With other controls	Within coastal/river prefectures	With other controls
	(1)	(2)	(3)	(4)
Coastal	0.56***	0.48***		
	(0.09)	(0.10)		
Yangtze	0.45***	0.42***		
	(0.09)	(0.10)		
Population in 1776 (10,000)		0.00	0.00	0.00
		(0.00)	(0.00)	(0.01)
Population in 1820 (10,000)		-0.00	-0.00	-0.00
		(0.00)	(0.00)	(0.01)
Silk		0.11		0.13
		(0.07)		(0.20)
Tea		0.04		-0.03
		(0.06)		(0.17)
Land tax in 1820 (1,000)		0.00		-0.00
		(0.00)		(0.00)
Imperial graduates per 10,000		0.11		0.04
		(0.08)		(0.03)
Distance to Grand Canal (10,000 meters)		0.01		-0.01
		(0.01)		(0.03)
Longitude		0.01		-0.00
		(0.01)		(0.04)
Latitude		-0.01		-0.02
		(0.01)		(0.02)
Taiping rebellion		-0.11		-0.17
		(0.08)		(0.23)
F(10, 167)		1.51		
Observations	182	180	57	52
R-squared	0.26	0.32	0.00	0.09

The coefficient on the coastal line and the Yangtze River: significant

The other covariates: jointly insignificant

Table 2: Summary statistics

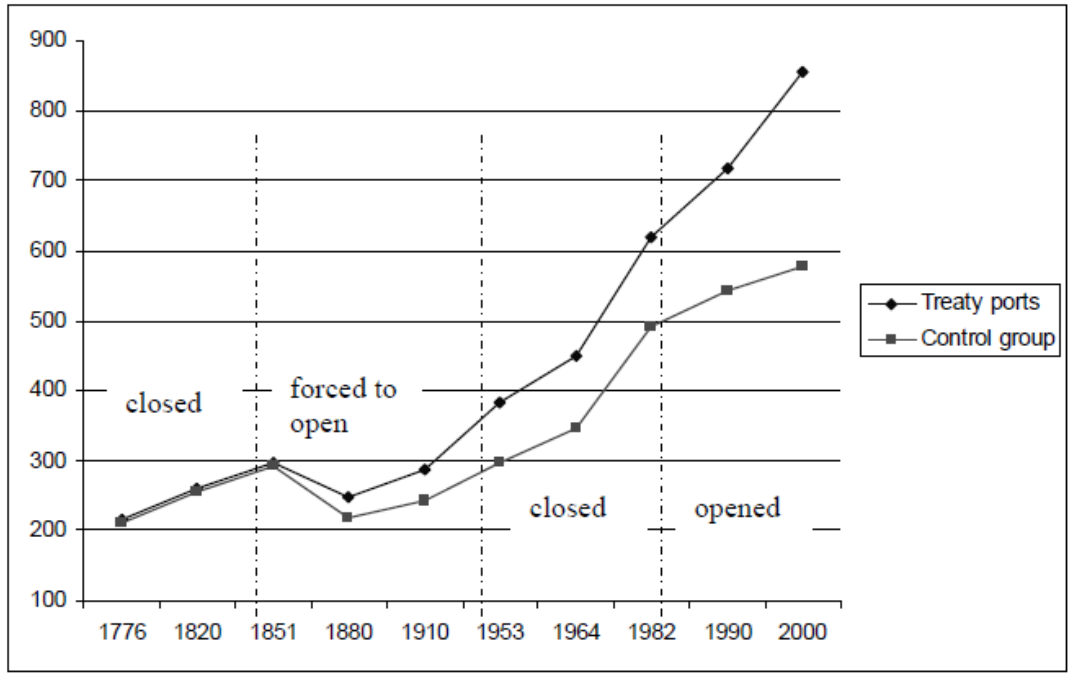
	Treaty ports	Control group	t-test
Population in 1776 (10,000)	214.97	210.33	0.13
	(25.40)	(21.94)	
Population in 1820 (10,000)	260.03	255.75	0.10
	(29.90)	(27.12)	
Silk	0.42	0.42	0.03
	(0.10)	(0.09)	
Tea	0.38	0.29	0.74
	(0.10)	(0.08)	
Land tax in 1820 (1,000)	188.09	181.33	-0.17
	(28.27)	(27.64)	
Imperial graduates per 10,000	3.50	2.63	1.08
	(0.72)	(0.35)	
Distance to Grand Canal (10,000 meters)	5.93	4.92	0.75
	(1.00)	(0. 91)	
Longitude	115.2	116.48	-1.06
	(0.72)	(0.98)	
Latitude	28.41	29.88	-1.21
	(1.00)	(0.72)	
Taiping rebellion	0.42	0.48	0.45
	(0.10)	(0.09)	
No. of prefectures	26	31	

There are no significant differences between the prefectures with treaty ports and the prefectures in the control group.

Estimation

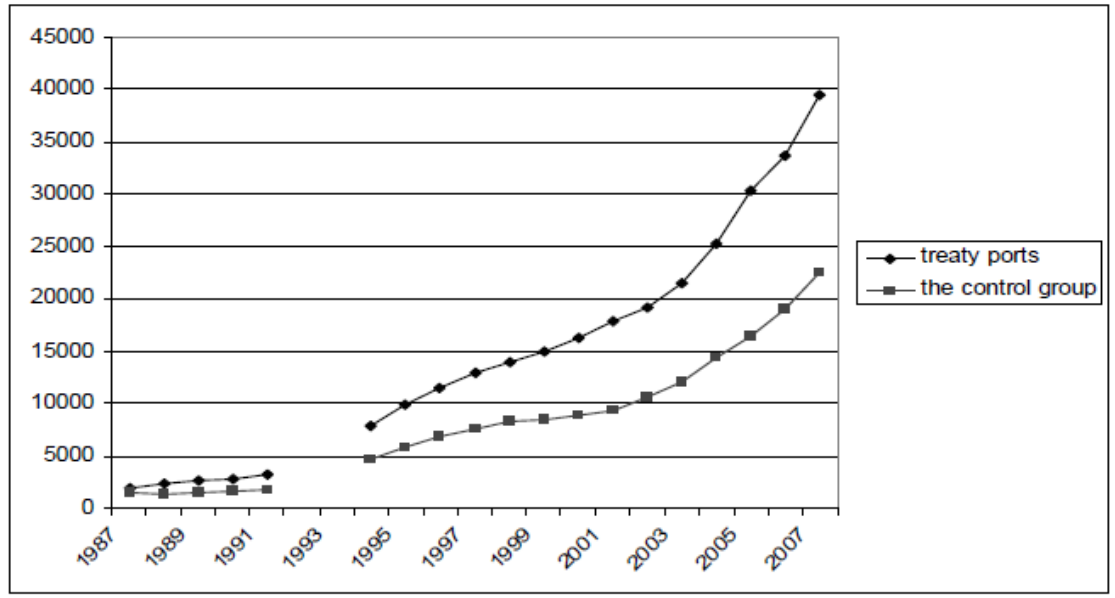
- The effects of history on development

Figure 3: Trends of prefecture-level population size from 1776-2000
(Population in 10,000)



Note: The treaty ports group includes all the prefectures that finally became treaty ports.

Figure 4: Trends of prefecture-level GDP per capita from 1987-2007
(GDP per capita in RMB)



Note: GDP per capita is not available for 1992 and 1993.

Estimation

- Estimation for 1776-1953

$D_{i,t}$ is a binary indicator of being a treaty port or not.

- Differences-in-differences

β is the average differences in log prefecture-level population sizes between treaty ports and the control group

γ: city fixed effect

δ: year fixed effect

$$\ln population_{it} = \gamma_i + \delta_t + \beta D_{i,t} + \varepsilon_{it},$$

Estimation

- Estimation for 1776-1953
- Control for pre-trends: time dummy for the years 1776 and 1820 I
- Control for the time-invariant observables X

$$\ln population_{it} = \gamma_i + \delta_t + \sum_{\tau \in \{1776,1820\}} \beta_\tau I_\tau * Treatyport_i + \beta D_{i,t} + \varepsilon_{it}.$$

$$\ln population_{it} = \gamma_i + \delta_t + \sum_{\tau \in \{1820,1851,1880,1910,1953\}} \beta_\tau I_\tau * X_i + \beta D_{i,t} + \varepsilon_{it}.$$

Estimation

- Estimation for 1776-1953

the (log) population size of the treaty ports is about 12% larger than that of the control group

Table 3: Long-run economic outcomes

Panel A: Economic outcomes in 1776-1953

Depend. Var.	Log (popu. size)	Log (popu. size)	Log (popu. size)	Log (popu. size)
Models	OLS regression	Fixed effects	Fixed effects with pre-trends	Fixed effects with time trends
	(1)	(2)	(3)	(4)
Post_opening	0.20**	0.12**	0.13*	0.14**
	(0.09)	(0.06)	(0.08)	(0.06)
TP*Year 1776			0.02	
			(0.10)	
TP*Year 1820			0.02	
			(0.10)	
Mean of depend. var.	7.69	7.69	7.69	7.69
S.d. of depend.var.	(0.65)	(0.65)	(0.65)	(0.65)
Observations	342	342	342	312
R-squared	0.01	0.84	0.84	0.87

Estimation

- Estimation for 1953 till today

$$\ln population_{it} = \gamma_i + \delta_t + \sum_{t=1964,1982,1990,2000} \beta_t Treatyport_i * Year_t + \varepsilon_{it}$$

$$\ln GDPPerCapita_{it} = \gamma_i + \delta_t + \sum_{t=1988}^{2007} \beta_t Treatyport_i * Year_t + \varepsilon_{it}$$

Estimation

- Estimation for 1953 till today

The advantage of treaty ports disappeared between 1960s and 1980s.

The differences became significant again after the opening of the country.

The growth rate of GDP per capita has been steadily higher in treaty ports since 1988.

Panel B: Economic outcomes from 1953 and on				
Depend. Var.	Log (popu. size)	Log(GDP per capita)	GDP per capita	Log (GDP per capita) within SEZs
Models	Fixed effects	Fixed effects	Fixed effects	Fixed effects
	(1)	(2)	(3)	(4)
TP* Year 1964	0.01			
	(0.04)			
TP* Year 1982	-0.01			
	(0.04)			
TP* Year 1990	0.03	0.37***	2265.4	0.03
	(0.04)	(0.09)	(2553.1)	(0.11)
TP* Year 1994		0.30***	3815.2	0.21**
		(0.09)	(2598.4)	(0.11)
TP* Year 2000	0.13***	0.37***	7708.2***	0.38***
	(0.04)	(0.09)	(2563.4)	(0.11)
TP* Year 2005		0.39***	15115.8***	0.45***
		(0.09)	(2571.7)	(0.11)
Mean of depend. var.	8.35	8.87	11891.1	9.12
S.d. of depend.var.	(0.64)	(1.06)	(13137.6)	(1.09)
Observations	285	974	974	265
R-squared	0.98	0.79	0.79	0.87

Estimation

- Urbanization outcomes
- Differences in differences

$$\ln(1 + urbanizationrate_{it}) = \gamma_i + \delta_t + \beta D_{i,t} + \varepsilon_{it}$$

Urbanization rates during the 1850s and the 1920s grew faster in the treaty ports group than in the control group.

Table 4: Estimation results for urbanization rates

VARIABLES	Log(1+urban. rate)	Log(1+urban. rate)
Method	OLS	Fixed effects
	(1)	(2)
Treaty ports	1.01***	1.92***
	(0.20)	(0.61)
Mean of depend. var. in the 1920s	1.91	1.91
S.d. of depend. var. in the 1920s	(0.95)	(0.95)
Observations	114	114
R-squared	0.19	0.86

Note: Standard errors are given in parentheses *** p<0.01, ** p<0.05, * p<0.1

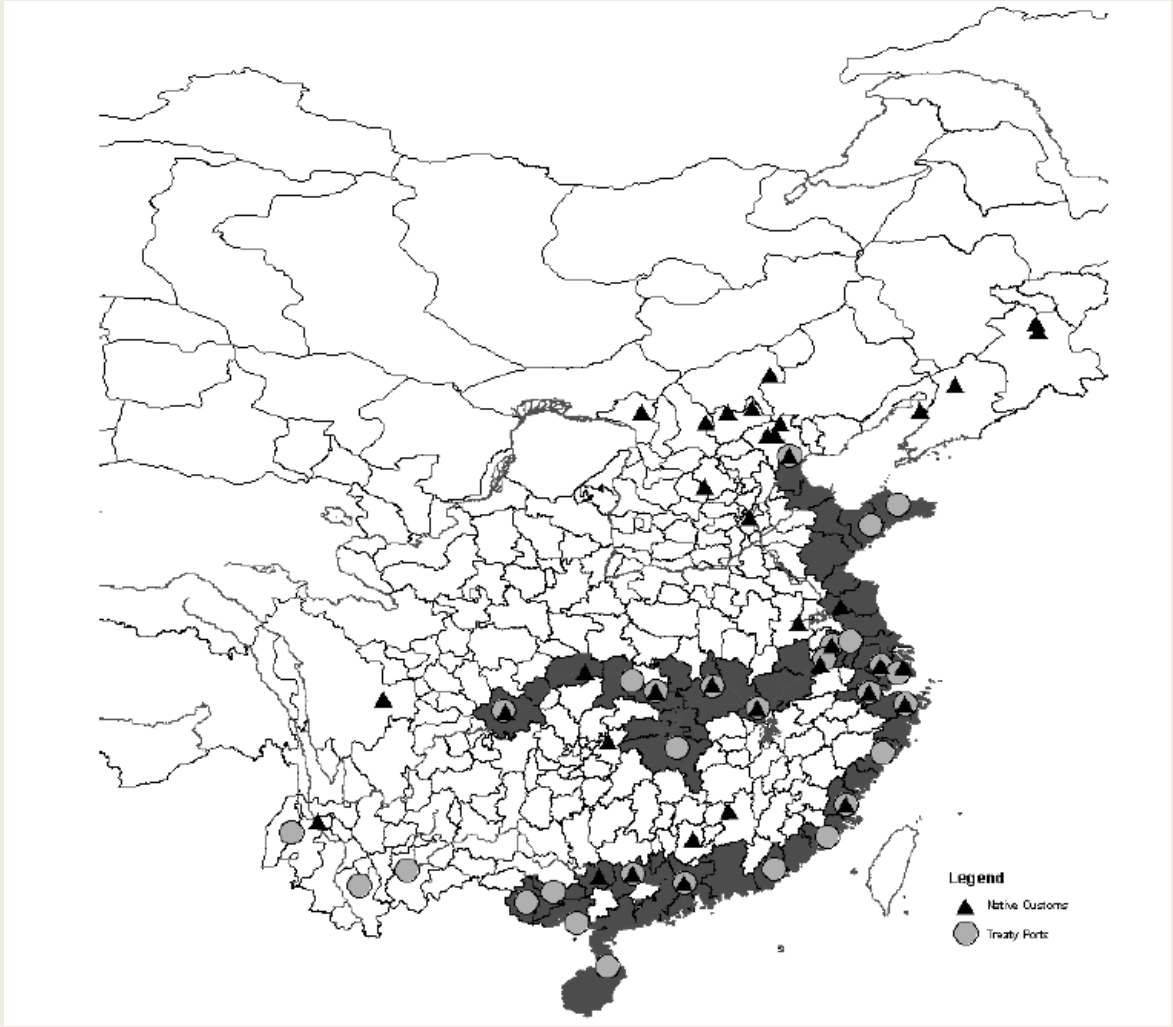
Estimation

- Historical custom stations (native customs) as instrumental variables

There were forty-three custom stations established in the 17th century.

for military consideration and to collect taxes from limited inland trade

May become treaty ports later



Estimation

- Custom stations as instrumental variables

Having custom stations was not related to pre-treaty population sizes or population growth.

Table 5: Placebo tests of using native customs as IV

Depend. var.	Log (popu. in 1776)	Log (popu. in 1820)	Log Growth 1776-1820
Method	OLS	OLS	OLS
	(1)	(2)	(3)
Native customs	0.04	0.04	-0.01
	(0.15)	(0.15)	(0.01)
Observations	57	57	57
R-squared	0.50	0.49	0.43

Note: Controls include dummies for silk and tea production areas, distance to the Grand Canal, longitude, latitude, prefecture-level land taxes in 1820. Standard errors are presented in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Estimation

- Custom stations as instrumental variables

Results are consistent with the results from differences-in-differences regressions.

Table 6: Estimation results using instrumental variable

Panel A: IV results for population growth between 1910 and 1953			
Depend. var.	Treaty ports	Log Popu. Growth 1910-1953	IV results
	First stage	Second stage	
	(1)	(2)	(3)
Native customs	0.45***	0.12**	
	(0.15)	(0.05)	
Treaty ports			0.27*
			(0.14)
Observations	57	57	57
R-squared	0.20	0.26	
Panel B: IV results for urbanization growth between 1850 and 1920			
Depend. var.	Treaty ports	Log (1+urban.rate) in the 1920s	IV results
	First stage	Second stage	
	(1)	(2)	(3)
Native customs	0.45***	1.03***	
	(0.15)	(0.24)	
Treaty ports			2.30***
			(0.59)
Observations	57	57	57
R-squared	0.20	0.38	0.27

$$\text{Treatyport}_i = \pi_0 + \pi_1 \mathit{HistoricalStations}_i + \gamma \text{X}_i + \varepsilon_i,$$

$$\text{G}_i = \pi_0' + \pi_1' \widehat{\mathit{Treatyport}}_i + \gamma' \text{X}_i + \varepsilon_i,$$

Mechanisms of history

- Geography including natural resources
- Tangible political or economic institutions
- Human capital
- Social norms or culture

Human capital and social norms play a more important role than geography and tangible institutions in this context.

Mechanisms of history

- Geography including natural resources

focused on places along the coast and the Yangtze River

compared the natural resources in treaty ports and the control group and do not see any significant differences

- Distance to a railway

treaty ports and the control group did not differ in terms of the distance to a railway in 1985

railways are not the most important means of transportation in the subsample of coastal/river places

Table 7: Differences in distances to railway (meters)

Year	Treaty ports	Control group	Differences
1985	38420	46153	-7733
	(13986)	(9893)	(16749)
2000	1523	8792	-7270**
	(1194)	(2673)	(3211)
number of prefectures	31	26	

Note: Standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Mechanisms of history

- Human capital

One of the most important institutional features in the history of China: the Imperial Exam System.

The opening of treaty ports introduced modern education to China in the form of missionary schools. The curriculum in the modern schools was close to today's education.

Treaty ports and the control group did not differ significantly from the Imperial exam in terms of graduates per capita.

Table 9: Differences in human capital

Panel A: Number of imperial graduates from the provincial level exam in the 1840s-1900s			
	Treaty ports	Control group	Differences
	3.50	2.63	0.87
	(0.72)	(0.36)	(0.80)
No. of prefectures	26	31	

Mechanisms of history

- Human capital

Significantly higher in treaty ports

Panel B: Human capital differences in 1920			
	Treaty ports	Control group	Differences
Primary school students per 10,000 individuals	112.4	72.5	39.9***
	(11.9)	(7.9)	(13.9)
No. of prefectures	26	31	

Panel C: Human capital differences in 1985			
	Treaty ports	Control group	Differences
Number of workers in natural science per 10,000 individuals	130	90	40*
	(20)	(14)	(25)
Number of workers in social science per 10,000 individuals	72	51	22***
	(6)	(5)	(8)
Number of college students per 10,000 individuals	48.28	23.78	24.50**
	(8.29)	(7.32)	(11.03)
No. of prefectures	26	31	

Panel D: Human capital differences in 2005			
	Treaty ports	Control group	Differences
University-educated workers (%)	20.3	14.8	5.5***
	(1.4)	(1.2)	(1.9)
No. of cities	22	19	

Note: Standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Mechanisms of history

- Attitudes, norms and culture

Merchants held a very low status in the Confucian social and ideological system.

The number of Christian organizations in 1920 as a proxy

Table 10: Differences in norms of doing business

Panel A: Number of Christian organizations in 1920			
	Treaty ports	Control group	Differences
Organized congregations	76.2	44.6	31.6*
	(19.5)	(11.2)	(21.6)
Evangelistic centers	104.7	56.5	48.2**
	(24.4)	(12.0)	(25.9)
No. of prefectures	26	31	
Panel B: Retail sales per capita (in RMB) in 1984-1986			
	Treaty ports	Control group	Difference
1984	574.7	468.9	105.8*
	(55.3)	(55.4)	(74.7)
1985	751.1	585.6	165.5**
	(74.4)	(62.0)	(96.9)
1986	853.4	620.7	232.7**
	(80.4)	(60.4)	(100.5)
No. of prefectures	26	31	
Panel C: Investment climate in 2005			
	Treaty ports	Control group	Differences
Foreign firms	0.14	0.19	-0.05*
	(0.03)	(0.02)	(0.03)
Chinese firms	0.44	0.62	-0.17**
	(0.04)	(0.04)	(0.06)
No. of cities	22	19	

Conclusion

- The places studied in this paper share similar geographical features (along the coastal line or along the Yangtze River) and are accessible to trade.
- Treaty ports have developed better in the short as well as in the long run despite the interruption between 1949 and the 1980s.
- The historical data suggests that human capital and social norms are the channels that persist.