Center for Economic Research

UNIVERSITÉ DE LYON

ENS DE LYON

Topics in Economic History

Class 3

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Outline

1. State-building as a catalyst for economic development
2. The dynamic consequence of state-building
3. Presentation and discussion
4. Reproducibility practice

State-building as a catalyst for economic development

Unbundling state capacity

- State capacity → the state's **power** to enforce and implement policies in order to "get things done" (Mann, Tilly, Besley-Persson, Acemoglu-Robinson)

- Key building blocks:
  - **1. coercive** capacity involves:
    - **extractive** capacity: the ability to raise taxes and armies
    - **enforcement** capacity: the ability to enforce law and discipline
  - **2. productive** capacity: the provision of **local** and **global** public goods
    - health, education, social protection, transportation...
    - redistributive impacts + complementarities with private sector

Unbundling state capacity

- Timothy Besley and Torsten Persson (2010). 'State Capacity, Conflict, and Development'. *Econometrica* 78.1, pp. 1–34. DOI: 10.3982/ECTA8073

- $\varnothing$ state capacities to $\nearrow$ revenue is a key factor in explaining the persistence of weak state
  - Model $\Rightarrow$ Investments in both legal and fiscal capacity increase with
    - (i) wages (for a given legal infrastructure)
    - (ii) % of nat'l income not generated by natural resources
    - (iii) expected value of public goods
    - (iv) level of political stability
    - (v) lower costs in either type of investment

- However $\Rightarrow$ no spatial dimension + fiscal capacity requires coercion + departure from the equilibrium + state-building intertwined with public goods provision

The impact of state capacity

- State **capacity** fosters economic growth and **development**
  - Persistent impacts of centralized states (Acemoglu et al 2015, Dell et al 2018)
  - Endogenous origins of state functions (Besley and Persson 2009, Tilly 1990)

- Growing literature on specific functions of young states
  - Tax capacity (Cantoni et al 2019, Dincecco and Katz 2015, Weigel 2020)
  - Security (Gennaioli and Voth 2015, Sanchez de la Sierra 2020)
  - Productive capacity (Dittmar and Meizenzahl 2020)

The impact of state capacity

- Redistributive impacts of public goods provision
  - Relocation of administrations (Becker et al 2020), planned cities
  - Winners and losers of administrative changes (Bai and Jia 2021)

- But little empirical evidence on the **dynamics** of state-building
  - How does state-building unfold, and when does it deliver benefits?
  - Numerous examples of both successes and failures of state-building...
  - and little understanding of how to make it work in practice

The dynamic consequence of state-building

The dynamic consequence of state-building

- Cédric Chambru et al. (2024). 'The Dynamic Consequences of State-Building: Evidence from the French Revolution'. *American Economic Review* 114.11, pp. 3578–3622. DOI: 10.1257/aer.2022011

- Intuitively: how state **functions** evolve over time matters
  - key distinction between **coercive** and **productive** capacity
  - but **ambiguous** effects on economic activity

- We study the radical reform associated with the French Revolution
  - 1790 administrative reform: a radical experiment in state-building
  - **short** and **long term** impacts on state capacity and development

This paper: Dynamics of state-building

- In February 1790, a **landmark reform** overhauled Ancien Régime institutions and divided France into 83 equal-sized departments
- In a subset of artificial departments: multiple **candidates cities** can become capital. Assembly allows election or rotation of functions.
- Final capitals **exogenously chosen** among the **candidate cities**
- We study how exogenous variation in **administrative presence** affects coercive power, public goods, and economic development
- Our focus is on the **dynamic** evolution of these different dimensions of state capacity and their impact on development over time.

Preview of results

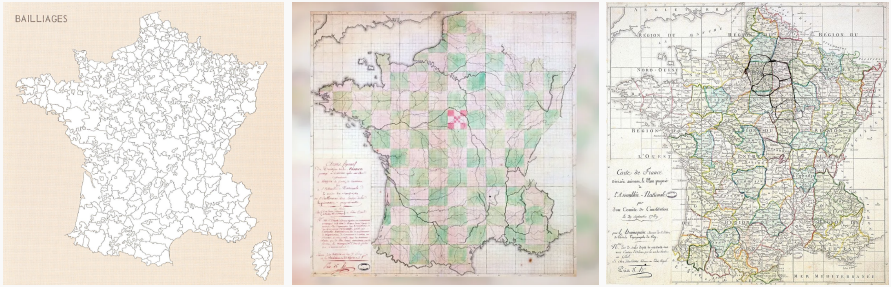
- **What we find:**
  - short-run: proximity to new centers increases **coercive capacity**
    - ↑ taxation of land (*cadastre*) + business tax (*patentes*)
    - ↑ conscription in Napoleonic armies (1802-1815)
  - medium-run: delayed benefits on local **public goods**
    - more schools, charity services in 2nd half of 19th century
    - investments telegraph and railway networks after 1860
  - long-run: positive impacts on **population** and **development**
    - null effects on population in the short run
    - 100 years after the reform, capitals are 40% more populated than comparable cities in 1790, and have twice the number of banks

⇒ Initial investments in coercive capacity are offset by long-term benefits in terms of public goods provision and economic development

The 1790 French Administrative Reform

- Under the Ancien Régime, France was governed through a complex network of jurisdictions whose boundaries did not overlap
  - bishoprics, bailiwicks (justice), *recettes* (tax), *subdélégations* (various)
  - approx. 800 old administrative centers with heterogeneous functions
  - administrative complexity was a major issue before the Revolution
- In 1790, France's first Constituent Assembly **overhauled** the administration of the Kingdom
  - establishment of a modern, hierarchical administrative network
  - division of the territory into new admin units: the **départements**
  - local centralization and homogenization of state capacity

The 1790 French administrative reform



- Sept-Dec 1789: *Comité de Constitution* designed the reform
- **26 February 1790 Decree** established a new division of the kingdom
- New admin boundaries reflected the rule of equal-sized *departments*
  - 18×18 *lieues* [leagues] (6,400 km^2 vs. 6,769 km^2 in our data)
  - some departments less artificial than others

The 1790 French administrative reform

- In a subset of departments, no obvious **candidate** for the capital city
  - competing demands from rival cities
  - multiple pressures on the committee (10,000 letters; 1,884 emissaries)
- Reform establishes a **rotation** of capital cities
  - initially proposed by Rabaut Saint-Etienne (1743-1793)
  - in some instances: functions shared across several cities, or local vote
- Rotations are **abolished** in September 1791; capitals must stay "where currently located"
  - some uncertainty persists throughout 1790s
  - in 1800, Napoleon consolidates the reform (*préfectures*)
  - Administrative network fairly stable for 200 years

The end of rotations

Quoi de plus ridicule et de plus onéreux que des administrations aussi gyrovagues, *qui nécessitent l'ambulance des papiers, des commis, la multiplication des bâtiments pour les recevoir ! Votre Constitution a établi une surveillance directe sur tous les points de l'Empire; chaque administré trouve près de lui une administration qui le dirige, le conseille (...). Ainsi, l'ambulance des administrations supérieures est devenue* **non seulement inutile, mais choquante***; le moment est venu où il est instant de proscrire cet abus.*

Departmental Histories

- Indre. The Decree allowed local voters to choose whether the capital should be located in **Châteauroux** (7,503 inhabitants in 1793) or rotate with the historical city of **Issoudun** (14,661). Both cities hosted a bailiwick, a tax center, and a *subdélégation*. Despite being the smaller of the two cities, Châteauroux defeated Issoudun in a 262 to 47 vote, with its more central location being a factor.

- Haute-Marne. The Decree allowed local voters to establish a rotation between the towns of **Chaumont** (5,448 inhabitants in 1793) and **Langres** (8,613). Both cities were important administrative centers in the Ancien Régime, but Langres also hosted a bishopric while Chaumont did not. Local delegates voted to establish the capital permanently in Chaumont, with a fraction of voters siding against Langres because it had refused to sell grain to neighboring municipalities in May 1770.

Sample construction and identification

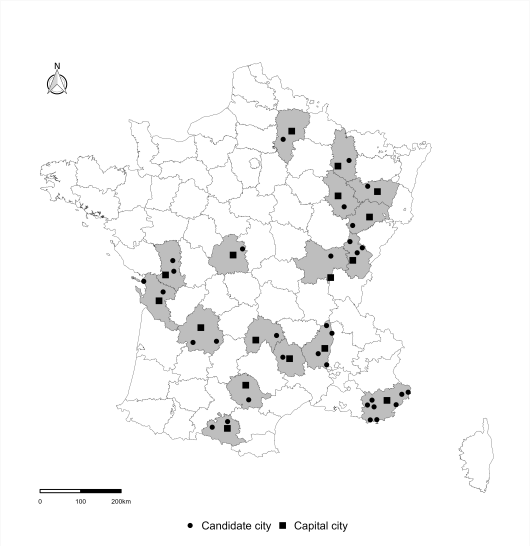
- Starting from the 83 departments created in 1790, we identify **artificial** new units based on the departments' original names
  - We exclude departments named after a single city or royal province
- In 28 departments, the Assembly failed to explicitly designate a capital and established a **rotation** or left the decision to a local vote.
- Two situations: candidate cities explicitly listed (17) or not (8)
  - In the latter: candidates identified from letters sent to the Committee
- **Assumption**: conditioning on being a candidate city, the choice of the final capital was quasi-random
  - Analogous to a stratified randomization where strata are departments.
  - Capitals and other candidates were *ex ante* indistinguishable.

Identification: artificial departments

Department	Original name	Candidate Cities
Aisne	du Vermandois et du Soissonnois	Laon*, Soissons
Ardèche	du Vélai et du Vivarais	Annonay, Aubenas, Bourg-Saint-Andéol, Privas*, Tournon
Ariège	de Foix et de Cousérans	Foix*, Pamier, Saint-Girons
Cantal	de la Haute-Auvergne	Aurillac*, Saint-Flour
Charente-Inférieure	de Saintonge et d'Aunis	Saint-Jean-d'Angély, La Rochelle, Saintes*
Deux-Sèvres	intermédiaire du Poitou	Niort*, Parthenay, Saint-Maixent
Dordogne	du Périgord	Bergerac, Périgueux*, Sarlat
Haute-Marne	méridional de la Champagne	Chaumont*, Langres
Haute-Saône	d'Amont	Gray, Vesoul*
Indre	du Bas Berry	Châteauroux*, Issoudun
Jura	d'Aval	Dole, Lons-le-Saunier*, Poligny, Salins-les-Bains
Lozère	du Gévaudan	Marvejols, Mende*
Meuse	du Barrois	Bar-le-Duc*, Saint-Mihiel
Saône-et-Loire	du Mâconnois	Chalon-sur-Saône, Macôn*
Tarn	de l'Albigeois	Albi*, Castres
Var	de l'est de la Provence	All district capitals (9 cities)
Vosges	des Vosges	Épinal*, Mirecourt
Ardennes	septentrional de la Champagne	Charleville*, Mézières, Rethel, Sedan
Aveyron	de Rouergue	Rodez*, Villefranche-de-Rouergue
Drôme	du Bas Dauphiné	Crest, Montélimar, Valence*
Finistère	de la partie basse de la Bretagne	Landerneau, Quimper*
Landes	des Landes et Chalosse	Dax, Mont-de-Marsan*
Manche	du Cotentin	Coutances, Saint-Lô*
Oise	du Beauvaisis	Beauvais*, Compiègne
Seine-et-Marne	de la Brie et du Gâtinois	Meaux, Melun*

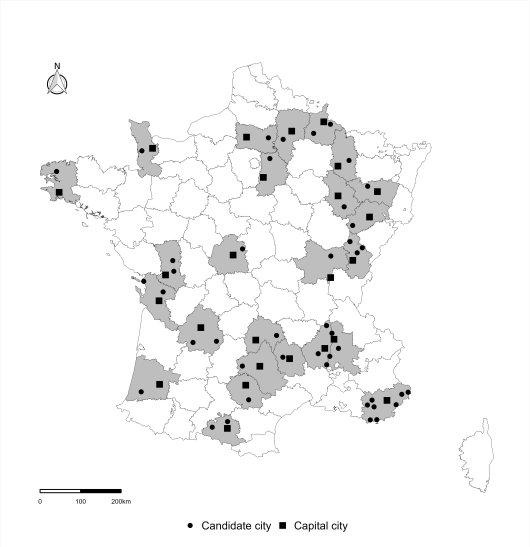
Identification: Rotating capitals

Baseline sample



Identification: Rotating capitals

Full sample



Comparing artificial departments with others

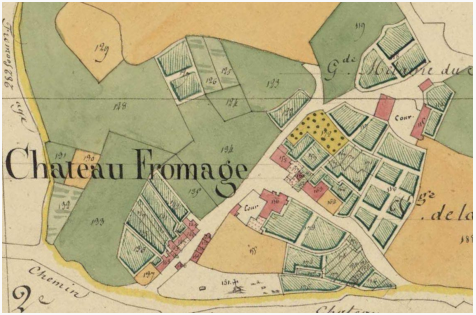
	(1) Baseline sample	(2) Augmented sample	(3) Other dep.	(4) Others, excl. Paris
Size of largest city (thousand)	10.82	11.23	40.30	28.92
	[4.96]	[5.05]	[89.76]	[26.2]
Δ(Largest-2nd largest city)	2.95	3.42	30.52	19.05
	[2.50]	[3.12]	[89.32]	[21.91]
Centrality of largest city	32.86	34.13	20.80	21.14
	[16.79]	[15.95]	[14.20]	[14.10]
Total population, 1793	287.05	303.55	337.56	330.18
	[87.9]	[94.05]	[145.7]	[135.6]
Population density, 1793	0.40	0.42	0.68	0.50
	[0.11]	[0.13]	[1.37]	[0.20]
Population growth, 1793-1800	-0.01	-0.01	-0.01	-0.01
	[0.05]	[0.05]	[0.06]	[0.06]
Land area (km2)	7,307.4	7,348.4	6,563.2	6,666.1
	[1,675.9]	[1,524.7]	[1,477.0]	[1,263.1]
Subdélégations	7.65	7.76	8.45	8.56
	[5.34]	[4.68]	[4.11]	[4.06]
Recettes	3.76	4.00	4.10	4.16
	[2.28]	[2.20]	[3.12]	[3.12]
Bailliages	4.82	5.40	5.00	5.02
	[3.17]	[3.10]	[3.50]	[3.53]
Evêchés	1.53	1.64	1.52	1.53
	[1.18]	[1.11]	[1.13]	[1.14]
Distance to Paris (km)	385.14	370.31	348.62	354.53
	[153.93]	[173.90]	[192.63]	[188.97]
Distance to sea (km)	203.99	172.39	160.58	160.7
	[126.83]	[121.24]	[116.62]	[117.65]

Data overview (1)

- We use a **fine lens** in space, time, and functions of the state
  - all outcomes at municipal level (focus on early 19th century)
  - extractive, enforcement and productive capacity
- Balanced panel of municipalities, **1800-1914**
  - 7,491 municipalities in baseline sample
  - pre-reform administrative functions
  - demographic and geo characteristics
- Comprehensive picture of **public** and **private** sector activity
  - ST/MT: public goods + banks, firms, innovation
  - LT: public and private employment

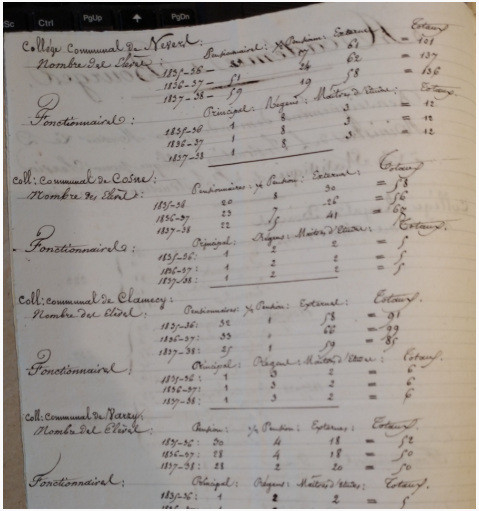
Data Overview (2)

$\Longrightarrow$ Comprehensive picture of public and private sector activity at city level



- Coercive capacity cadastre
  - first land registry (**cadastre**), 1807-1850
  - business tax (**patentes**) in 1839-47
  - conscription in Napoleonic armies, 1802-1815
  - police force; prison and tribunal buildings conbavil

Data Overview (3)



- Productive capacity and public goods
  public goods
  - hospitals, schools, religious buildings until 1840
  - secondary schools in 1816, 1836, 1866
  - services for the poor in 1871
  - telegraph (1863) and date of first train station (1840 onwards)

Data Overview (3)

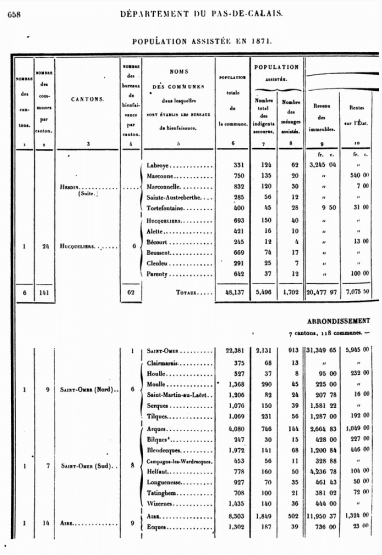


- Productive capacity and public goods

  public goods

  - hospitals, schools, religious buildings until 1840
  - secondary schools in 1816, 1836, 1866
  - services for the poor in 1871
  - telegraph (1863) and date of first train station (1840 onwards)

Data Overview (4)



658 DÉPARTEMENT DU PAS-DE-CALAIS.

POPULATION ASSISTÉE EN 1871.

NUMÉROS des cantons.	NOMBRE des communes par canton.	CANTONS.	NOMBRE des bureaux de bienfaisance par canton.	NOMS DES COMMUNES dans lesquelles SONT ÉTABLIS LES BUREAUX de bienfaisance.	POPULATION totale de la commune.	POPULATION assistée. Nombre total des indigents secourus.	POPULATION assistée. Nombre des ménages secourus.	Revenu des immeubles.	Rentes sur l'État.
1								fr. c.	fr. c.
				Labroye	331	194	62	3,945 04	"
				Marconne	750	135	20	"	340 00
				Marconnelle	832	120	30	"	7 00
		Hesdin (Suite.)		Sainte-Austreberthe	285	56	12	"	"
				Tortefontaine	400	45	28	9 50	31 00
				Hecquenlieres	693	150	40	"	"
				Alette	421	16	10	"	"
				Beaumet	215	12	4	"	12 00
				Beaumetel	669	74	17	"	"
				Cléuleu	291	25	7	"	"
				Parenty	642	37	12	"	100 00
6	141		62	TOTAUX	48,137	5,496	1,702	20,477 97	7,075 50
				ARRONDISSEMENT 7 cantons, 118 communes. —					
			1	SAINT-OMER	22,381	2,131	913	31,349 65	5,945 00
				Clairmarais	375	68	13	"	"
				Houlle	227	37	8	95 00	252 00
1	9	SAINT-OMER (Nord)	6	Moulle	1,268	280	45	225 00	"
				Saint-Martin-au-Laërt	1,206	82	24	207 78	16 00
				Serques	1,076	150	39	1,581 22	"
				Tilques	1,069	231	56	1,287 00	192 00
				Arques	5,080	766	184	2,664 83	1,049 00
				Blêquen	917	30	15	428 00	227 00
				Herzbrouck	1,972	181	68	1,200 84	466 00
				Campagne-les-Wardrecques	653	56	11	228 88	"
1	7	SAINT-OMER (Sud)	8	Helfaut	778	160	50	4,236 78	100 00
				Longuenesse	927	70	35	861 43	50 00
				Tatinghem	708	100	21	381 02	72 00
				Wizernes	1,535	140	36	444 00	"
1	10	AIRE	9	Aire	8,303	1,849	502	11,950 37	1,334 00
				Enquin	1,302	187	39	736 00	23 00

- Economic development **banks and firms**
  - banking establishments throughout 19th century
  - first industrial census (1839-47) and patent data (INPI)
  - contemporary data (DADS/INSEE)

Empirical strategy: Capitals vs. Rotation cities

- First approach: compare chosen capitals to other candidate cities

$$y_{ij} = \alpha_0 + \alpha_1 C_{ij} + \delta_j + \varepsilon_{ij} \quad (1)$$

- where
  - city i, departement j. $C_{ij} = 1$ for the final capital in 1800
  - y_{ij} = coercive capacity, public goods, econ outcomes, population
  - α_1 captures causal effect of being the final capital

- Small $N \Rightarrow$
  - 95% permutation-based RI intervals, following Young (2023)
  - Inference: robust SEs + clustering by departement (wild bootstrap)
  - Controls selected via Lasso (Belloni et al. 2014)
  - Design-based approach: reweight the data to account for different treatment probabilities

Empirical strategy: Proximity to capitals

- Second approach: measure effects of proximity

$$y_{ij} = \alpha + \beta CloseToC_{ij} + \mathrm{X_{ij}}\mathbf{\Omega}' + \delta_j + \varepsilon_{ij} \quad (2)$$

- where
  - municipality i (excluding candidate cities), departement j
  - $CloseToC_{ij} = 1$ if the nearest candidate city is chosen as capital
  - can restrict to a x-km radius around C
  - $\mathrm{X_{ij}}$ includes 1793 and 1800 population, geographic controls (lat/lon, land area, altitude, dist to centroid/border), and dummies for old functions: *bailiwicks, recettes, bishoprics, subdélégations*
  - β captures causal effect of proximity to the final capital

Capitals vs Candidate cities: Balance checks

Demography and Market Access

	(1) **Capitals** [SD]	(2) **Candidates** [SD]	(3) **t-test** {RI p-value}	(4) **Difference** (SE)	(5) **OLS** (SE)	(6) **Randomization inference** [95% CI] & {RI p-value}
Demography						
Market access (low trade frictions)	10.46	10.47	t=-0.17	-0.016	-0.041	[-0.217,0.154]
	[0.55]	[0.66]	{0.867}	(0.094)	(0.098)	{0.825}
Market access (high trade frictions)	6.50	6.31	t=0.52	0.187	0.139	[-0.633,0.791]
	[1.55]	[1.74]	{0.608}	(0.359)	(0.374)	{0.837}
Log urban potential	11.66	11.65	t=0.38	0.004	0.004	[-0.021,0.194]
	[0.13]	[0.13]	{0.711}	(0.010)	(0.010)	{0.400}
Log population in 1793	8.85	8.75	t=0.86	0.101	0.095	[-0.132,0.505]
	[0.44]	[0.49]	{0.405}	(0.117)	(0.120)	{0.226}
Log population in 1800	8.86	8.77	t=0.80	0.087	0.088	[-0.131,0.489]
	[0.41]	[0.42]	{0.460}	(0.109)	(0.116)	{0.244}
Population growth, 1793-1800	0.01	0.02	t=-0.27	-0.013	-0.007	[-0.092,0.073]
	[0.17]	[0.16]	{0.789}	(0.050)	(0.041)	{0.727}
Largest city in department (0/1)	0.35	0.34	t=0.09	0.017	-0.006	[-0.307,0.438]
	[0.49]	[0.42]	{0.938}	(0.198)	(0.162)	{0.790}
Land area (km2)	33.40	37.70	t=-0.46	-4.295	-5.304	[-28.90,10.47]
	[19.04]	[31.03]	{0.653}	(9.310)	(8.331)	{0.327}

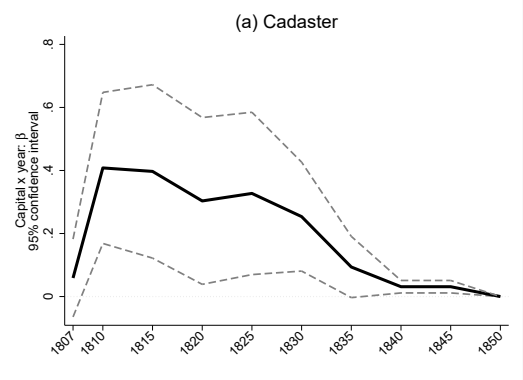
- Market access measured following Donaldson and Hornbeck (2016)
- We use data on roads and navigable waterways in 1789 and assume $\theta \in \{3; 8.22\}$

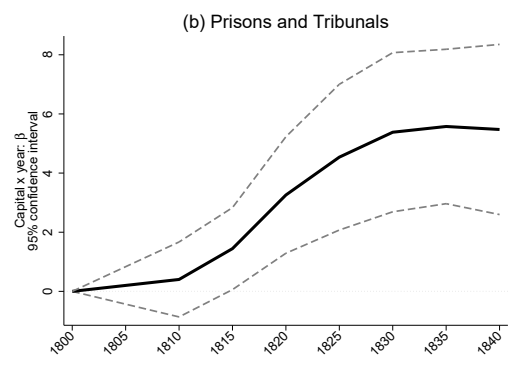
Capitals vs Candidate cities: Balance checks

Old Administrative Functions

	(1) **Capitals** [SD]	(2) **Candidates** [SD]	(3) **t-test** {RI p-value}	(4) **Difference** (SE)	(5) **OLS** (SE)	(6) **Randomization inference** [95% CI] & {RI p-value}
Administrative Functions						
Bishopric (*évêché*)	0.35	0.40	t=-0.43	-0.051	-0.049	[-0.264,0.274]
	[0.49]	[0.44]	{0.812}	(0.119)	(0.111)	{0.864}
Bailiwick (*bailliage*)	0.82	0.84	t=-0.13	-0.015	-0.009	[-0.253,0.394]
	[0.39]	[0.32]	{1.00}	(0.114)	(0.112)	{0.435}
Tax center (*recette*)	0.94	0.75	t=2.26	0.191	0.203	[0.000,0.469]
	[0.24]	[0.40]	{0.061}	(0.084)	(0.085)	{0.058}
Admin center (*subdélégation*)	0.94	0.90	t=0.54	0.037	0.021	[-0.157, 0.235]
	[0.24]	[0.26]	{0.750}	(0.068)	(0.067)	{0.480}
Old functions	3.06	2.90	t=0.57	0.162	0.166	[-0.346,1.146]
	[0.97]	[1.14]	{0.723}	(0.284)	(0.246)	{0.301}
Police force (*maréchaussée*)	3.76	4.06	t=-0.56	-0.294	-0.207	[-0.981,1.265]
	[0.97]	[1.95]	{0.655}	(0.527)	(0.513)	{0.629}
College (*collège*)	0.94	0.89	t=0.55	0.051	0.036	[-0.178,0.290]
	[0.24]	[0.27]	{0.751}	(0.093)	(0.108)	{0.589}

Results I: The early buildup of coercive capacity





Results I: The early buildup of coercive capacity

Short-term effects (before 1815): N=50 (17 capitals)

	(1) **Capitals** [SD]	(2) **Candidates** [SD]	(3) **t-test** {RI p-value}	(4) **Difference** (SE)	(5) **OLS** (SE)	(6) **Randomization inference** [95% CI] & {RI p-value}
A. Short term (before 1815)						
Cadaster by 1815	0.65	0.27	t=2.61	0.375	0.385	[0.116,0.672]
	[0.49]	[0.39]	{0.027}	(0.144)	(0.140)	{0.010}
Conscripts 1802-1815	5.81	5.65	t=1.47	0.162	0.184	[-0.026,0.539]
	[0.51]	[0.55]	{0.164}	(0.110)	(0.120)	{0.075}
Police force in 1816	3.18	0.91	t=7.69	2.262	2.329	[1.839,2.907]
	[0.81]	[0.51]	{0.000}	(0.294)	(0.315)	{0.000}
Prison project by 1815	0.59	0.41	t=1.30	0.179	0.184	[0.000,0.570]
	[0.51]	[0.47]	{0.220}	(0.138)	(0.130)	{0.066}
Tribunal project by 1815	0.71	0.38	t=2.68	0.324	0.305	[0.103,0.793]
	[0.47]	[0.45]	{0.032}	(0.121)	(0.118)	{0.023}
Secondary school, 1812	0.94	0.79	t=1.40	0.147	0.139	[0.000,0.481]
	[0.24]	[0.37]	{0.262}	(0.105)	(0.119)	{0.057}
Hospital project by 1815	0.35	0.30	t=0.29	0.051	0.022	[-0.234,0.482]
	[0.49]	[0.43]	{0.863}	(0.176)	(0.138)	{0.527}

Results I: The early buildup of coercive capacity

Short-term effects (before 1815): N=69 (25 capitals)

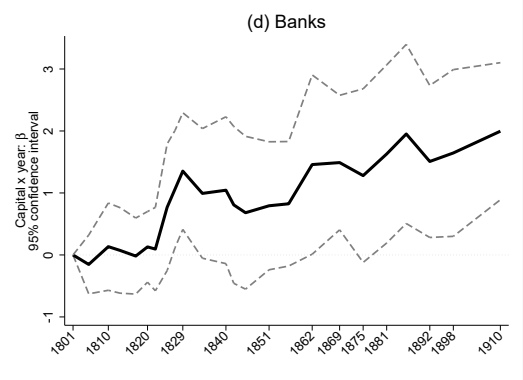
	(1) **Capitals** [SD]	(2) **Candidates** [SD]	(3) **t-test** {RI p-value}	(4) **Difference** (SE)	(5) **OLS** (SE)	(6) **Randomization inference** [95% CI] & {RI p-value}
A. Short term (before 1815)						
Cadaster by 1815	0.63	0.24	t=3.33	0.377	0.384	[0.152,0.596]
	[0.49]	[0.38]	{0.005}	(0.111)	(0.112)	{0.004}
Conscripts 1802-1815	5.88	5.70	t=1.81	0.174	0.187	[-0.001,0.483]
	[0.52]	[0.50]	{0.083}	(0.096)	(0.104)	{0.051}
Police force in 1816	3.16	0.91	t=8.06	2.252	2.246	[1.742,2.809]
	[1.03]	[0.49]	{0.000}	(0.279)	(0.315)	{0.000}
Prison project by 1815	0.60	0.37	t=2.04	0.228	0.225	[0.057,0.541]
	[0.50]	[0.46]	{0.049}	(0.112)	(0.109)	{0.044}
Tribunal project by 1815	0.68	0.31	t=3.08	0.367	0.344	[0.143,0.725]
	[0.48]	[0.43]	{0.007}	(0.119)	(0.113)	{0.001}
Secondary school, 1812	0.92	0.75	t=1.84	0.173	0.154	[0.000,0.444]
	[0.28]	[0.39]	{0.074}	(0.094)	(0.105)	{0.069}
Hospital project by 1815	0.36	0.28	t=0.54	0.075	0.061	[-0.143,0.423]
	[0.49]	[0.43]	{0.667}	(0.138)	(0.114)	{0.319}

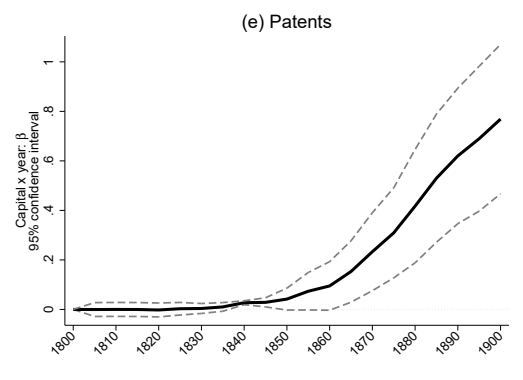
Results II: The gradual dividends of state-building

Medium-term effects (before 1850): N=50 (17 capitals)

	(1) **Capitals** [SD]	(2) **Candidates** [SD]	(3) **t-test** {RI p-value}	(4) **Difference** (SE)	(5) **OLS** (SE)	(6) **Randomization inference** [95% CI] & {RI p-value}
B. Medium term (before 1850)						
Business tax per plant, 1839	5.23	3.73	t=2.30	1.506	1.337	[0.175,2.582]
	[1.45]	[2.42]	{0.037}	(0.654)	(0.581)	{0.035}
Secondary school, 1836	0.94	0.78	t=1.65	0.162	0.158	[0.000,0.520]
	[0.24]	[0.37]	{0.180}	(0.098)	(0.108)	{0.043}
Hospital project by 1840	0.65	0.39	t=1.82	0.260	0.201	[-0.085,0.677]
	[0.49]	[0.44]	{0.107}	(0.143)	(0.136)	{0.111}
Industrial establishments, 1839	2.70	1.96	t=2.11	0.738	0.781	[-0.065,1.447]
	[1.29]	[1.41]	{0.047}	(0.35)	(0.359)	{0.076}
Banks, 1851	2.82	2.67	t=0.31	0.152	0.308	[-0.418,1.900]
	[1.47]	[1.40]	{0.773}	(0.485)	(0.530)	{0.235}
Patents registered by 1850	2.67	1.87	t=2.12	0.805	0.845	[0.272,1.513]
	[0.88]	[1.44]	{0.052}	(0.380)	(0.327)	{0.009}

Results II: The gradual dividends of state-building





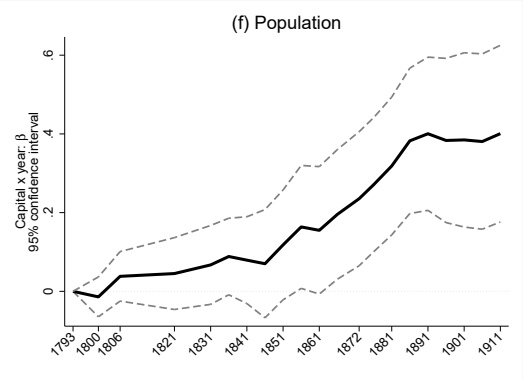
Results III: The gradual dividends of state-building

Long-term effects (before 1914): N=50 (17 capitals)

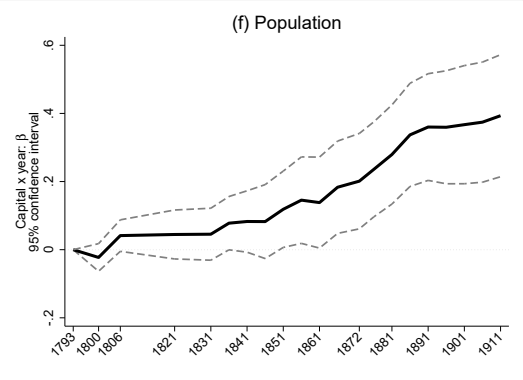
	(1) **Capitals** [SD]	(2) **Candidates** [SD]	(3) **t-test** {RI p-value}	(4) **Difference** (SE)	(5) **OLS** (SE)	(6) **Randomization inference** [95% CI] & {RI p-value}
C. Long term (before 1914)						
Telegraph connexion, 1863	0.88	0.04	t=8.25	0.846	0.841	[0.636,1.00]
	[0.33]	[0.12]	{0.000}	(0.103)	(0.097)	{0.000}
Welfare beneficiaries, 1871	7.22	6.69	t=2.44	0.532	0.580	[0.081,2.115]
	[0.73]	[0.91]	{0.026}	(0.218)	(0.277)	{0.029}
Train station, 1870	0.82	0.48	t=3.20	0.346	0.362	[0.176,0.569]
	[0.39]	[0.47]	{0.014}	(0.108)	(0.102)	{0.003}
Banks, 1910	5.12	3.42	t=2.99	1.699	1.730	[0.826,3.065]
	[1.69]	[1.79]	{0.013}	(0.568)	(0.565)	{0.002}
Patents registered by 1900	5.05	3.81	t=4.54	1.243	1.288	[0.818,2.047]
	[0.78]	[1.28]	{0.000}	(0.274)	(0.271)	{0.000}
Log population, 1886	9.59	9.12	t=3.54	0.462	0.466	[0.188,0.943]
	[0.43]	[0.51]	{0.002}	(0.130)	(0.136)	{0.005}
Log pop., no civil servants, '86	9.39	9.05	t=2.09	0.341	0.302	[-0.050,0.822]
	[0.59]	[0.53]	{0.051}	(0.163)	(0.185)	{0.074}
Log population, 1911	9.67	9.18	t=3.56	0.487	0.486	[0.172,0.998]
	[0.51]	[0.56]	{0.003}	(0.137)	(0.147)	{0.007}
D. Very long term						
Log population, 1999	10.11	9.45	t=3.91	0.663	0.636	[0.218,1.014]
	[0.55]	[0.71]	{0.002}	(0.169)	(0.184)	{0.003}
Public employees (p.c.), 2015	0.26	0.15	t=4.23	0.112	0.117	[0.073,0.170]
	[0.09]	[0.06]	{0.001}	(0.026)	(0.027)	{0.000}
Private employees (p.c.), 2015	0.62	0.42	t=4.87	0.195	0.197	[0.121,0.283]
	[0.15]	[0.09]	{0.000}	(0.040)	(0.037)	{0.000}

Effects on population

Main sample ($N = 50$)



Main sample ($N = 69$)



Unpacking the effects on population

Civil servants

- What is the contribution of **civil servants** to population growth?
- We conduct a detailed empirical exercise for **1886**
- Complete census data on civil servants and their families
- Spatial allocation across capitals vs. candidate and other cities
  - 3 departments: Cantal, Jura, Tarn
  - **19%** of civil servants reside in the capital: local administration, secondary education, civil engineering...
  - 10% reside in other candidate cities
  - other municipalities: primary teachers, railway and postal workers...

Effects on population

With and without civil servants, 1886

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Log population in:				
	1800	1821	1846	1866	1886	1886†	1911	1999
Capital in 1800	-0.0049	0.0700	0.1203	0.2755	0.4475	0.3036	0.4729	0.7492
	[0.0448]	[0.0426]	[0.0678]	[0.0844]	[0.0930]	[0.1117]	[0.1116]	[0.1488]
	(0.0365)	(0.0469)	(0.0613)	(0.0698)	(0.0836)	(0.1139)	(0.1017)	(0.1420)
	{0.891}	{0.159}	{0.076}	{0.002}	{0.000}	{0.014}	{0.001}	{0.000}
Closest candidate is capital	-0.0119	-0.0088	-0.0339	-0.0385	-0.0388	-0.0445	-0.0394	0.1391
	[0.0107]	[0.0069]	[0.0115]	[0.0120]	[0.0173]	[0.0186]	[0.0284]	[0.0613]
	(0.0131)	(0.0087)	(0.0146)	(0.0153)	(0.0227)	(0.0245)	(0.0387)	(0.0787)
	{0.390}	{0.367}	{0.056}	{0.038}	{0.131}	{0.110}	{0.364}	{0.124}
Number of municipalities	3,264	3,254	3,261	3,261	3,264	3,260	3,264	3,076
DV control mean	6.075	6.179	6.290	6.235	6.148	6.089	5.982	5.785
Department FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.945	0.963	0.937	0.923	0.892	0.877	0.843	0.704

***Notes*: SEs clustered by city in brackets; by department in parentheses; wild bootstrap p-values in curly brackets.**

- Civil servants are responsible for **1/3** of population growth in capitals
- We also find large effects on public and private employment in 2010

Conclusion

- We draw on a unique historical administrative reform to study the dynamic evolution of state capacity over the subsequent 100 years
- The revolutionaries correctly assumed that investments in state capacity would shape subsequent economic development...
- ...but the new capitals also paid a price for their new status, in the form of greater exposure to the coercive power of the state.
- In our context, **"virtuous circle"** from administrative reform $\Rightarrow$ investments in state capacity $\Rightarrow$ economic development
- Future work: participation, accountability and social conflict

Presentation and discussion

Presentation

- **jha2023revolutionary**

Reproducibility exercise

The Good, the Bad and the Ugly link

Good.

- Meaningful sub directories
- top level `README`
- code/data/output are separated

```
.
├── README.md
├── code
│   ├── R
│   │   ├── 0-install.R
│   │   ├── 1-main.R
│   │   ├── 2-figure2.R
│   │   └── 3-table2.R
│   ├── stata
│   │   ├── 1-main.do
│   │   ├── 2-read_raw.do
│   │   ├── 3-figure1.do
│   │   ├── 4-figure2.do
│   │   └── 5-table1.do
│   └── tex
│       ├── appendix.tex
│       └── main.tex
├── data
│   ├── processed
│   └── raw
└── output
    ├── plots
    └── tables
```

Not So Good.

- Sub directories are not helpful
- File names are confusing
- no `README`
- code/data/output are *not* separated

```
.
├── 20211107ext_2v1.do
├── 20220120ext_2v1.do
├── 20221101wave1.dta
├── james
│   └── NLSY97
│       └── nlsy97_v2.do
├── mary
│   └── NLSY97
│       └── nlsy97.do
├── matlab_fortran
│   ├── graphs
│   ├── sensitivity1
│   │   ├── data.xlsx
│   │   ├── good_version.do
│   │   └── script.m
│   └── sensitivity2
│       ├── models.f90
│       ├── models.mod
│       └── nrtype.f90
├── readme.do
├── scatter1.eps
├── scatter1_1.eps
```

What is not a data citation

Many authors initially neglect to add data citations, or do not know how to add a data citation. Often, we see authors cite papers with supplementary data, but not databases or other data:

> *We use data acquired from the NHL, dates of power outages collected by Tremblay et al (2018), augmented with information on the language and grammar skills of hockey players provided by the Ethnologue database.*

(note absence of citation for NHL and Ethnologue data). In the above example, three datasets are used, but only one is cited in some fashion.

Better

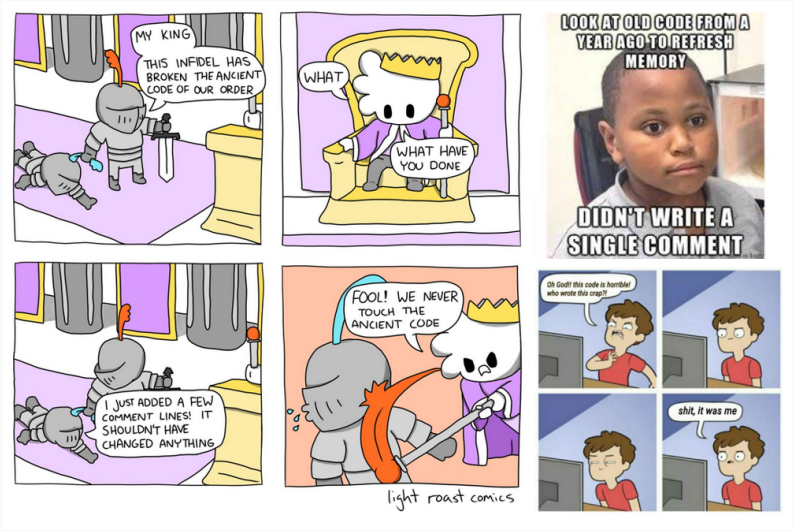
The above example can be improved as follows:

> *We use data acquired from the NHL (NHL, 2018), dates of power outages collected by Tremblay et al (2018, 2019), augmented with information on the language and grammar skills of hockey players provided by the Ethnologue database (Eberhard et al, 2019).*

with the reference list having the following entries:

> Eberhard, David M., Gary F. Simons, and Charles D. Fennig (eds.). 2019. *Ethnologue: Languages of the*

Don't be ugly: do comment your code!



A first hand on reproducibility

Reason for incomplete reproducibility [link]

- Be organised! Your working directory [link]
- Get started
  - Full or limited replication package?
  - File path?
  - Software packages? (see the README file)
  - Are all the data (publicly) available?
- What do you do?
  - Baseline results? data quality? coding of variables? heterogeneity? sample restriction? log transformations? SEs? etc.

Example: Data quality

- Guinnane (2023): Do we know the population of every city for past 500 years?
  - Lyon's population: 102 200 (census 1793), 88 900 (census 1800), 109 000 (Bairoch 1988)
  - Bordeaux's population: 104 700 (census 1793), 91 600 (census 1800), 96 000 (Bairoch 1988)
  - Re-run column 1 in Waldinger (2022) with French data only $\Rightarrow$ re-run it using data from Cassini [Data]

Additional resources on reproducibility

- Website of the Social Science Data Editors (by Lars Vilhuber):
  `https://social-science-data-editors.github.io/guidance/addtl-data-citation-guidance.html`
- Website of the EJ data editor: `https://ejdataeditor.github.io`
- Website of the AEA Data Editor:
  `https://aeadataeditor.github.io/aea-de-guidance`
- Website of the Institute for Replication (I4R):
  `https://i4replication.org/index.html`

Questions?

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References I

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Chambru, Cédric, Emeric Henry and Benjamin Marx (2024). 'The Dynamic Consequences of State-Building: Evidence from the French Revolution'. *American Economic Review* 114.11, pp. 3578–3622. DOI: 10.1257/aer.2022011.

Chiovelli, Giorgio, Leopoldo Fergusson, Luis R. Martinez, Juan David Torres and Felipe Valencia Caicedo (2024). *Bourbon Reforms and State Capacity in the Spanish Empire*. Working paper No. 36. Becker Friedman Institute for Economics.

Guinnane, Thimoty W. (2023). 'We Do Not Know the Population of Every Country in the World for the Past Two Thousand Years'. *The Journal of Economic History* 83.3, pp. 912–938. DOI: 10.1017/S0022050723000293.

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Young, Alwyn (2023). 'Asymptotically Robust Permutation-based Randomization Confidence Intervals for Parametric OLS Regression'. *European Economic Review*, p. 104644. DOI: 10.1016/j.euroecorev.2023.104644.