Readme on data and replication files for
Xu and Yang, “Real effects of supplying safe private money”
in the *Journal of Financial Economics*

This readme explains the datasets, variables, and replication files. The code was last run on a Apple M2 Max laptop (32G) with MacOS version Ventura 13.6.6. We used Stata 16. It took 448 seconds to run the main code file. The contents of each subfolder of the zipped replication file are explained below.

**Dataset list**

|  |  |  |  |
| --- | --- | --- | --- |
| Data file | Source | Notes | Provided |
| data/occ1875\_uniquetown\_output.dta | Annual Report of the Comptroller of the Currency 1875 | Bank balance sheet information in 1875  | Yes |
| data/occ1886\_uniquetown\_output.dta | Annual Report of the Comptroller of the Currency 1886 | Bank balance sheet information in 1886 | Yes |
| data/ gaz1990countydistance`dist'miles.dta | 1990 Census gazetteer files for counties from NBER | 1990 county distance information | Yes |
| data/cost\_708090.dta | Atack, 2016; Donaldson and Hornbeck, 2016; Hornbeck and Rotemberg, 2021 | Counties’ physical trade costs with railroad access in 1875 and 1880; transportation market access in 1870 and 1880. | Yes |
| data/cost\_7080.dta | All listed | Combines multiple data sources from above | Yes |
| data/adjustedpopulations\_708090\_wide.dta | Hornbeck and Rotemberg, 2021 | Town and city populations covering the decades 1870 to 1890 | Yes |
| data/MA\_7080.dta | All listed | Monetary market access data created from “cost\_7080.dta” and “adjustedpopulations\_708090\_wide” | Yes |
| data/temp\_census\_ma7080.dta | Censuses of Agriculture and Manufacturing | Census information of agricultural sector and manufacuturing sector | Yes |
| data/orig\_sample.dta | Atack, 2016 | Railroad data | Yes |
| data/Mainsample.data | All listed | Real economics outcome data created from temp\_census\_ma7080.dta and orig\_sample.dta | Yes |
| data/HistPat\_event.dta | Petralia et al (2016) | Historical patent data | Yes |
| data/HistPat\_event.dta | All listed | Created from HistPat\_event.dta and Mainsample.dta | Yes |

**List of tables and programs:**

|  |  |  |  |
| --- | --- | --- | --- |
| Figure/Table # | Program | Line Number | Output file |
| Table 1 | code/tables.do | 1 | output/sumstats.tex |
| Table 2 | code/tables.do | 44 | output/T2\_firststage\_MMA\_rail70.tex |
| Table 3 | code/tables.do | 113 | output/OLSIV\_2panels1.tex |
| Table 4 | code/tables.do | 113 | output/OLSIV\_2panels2.tex |
| Table 5 | code/tables.do | 113 | output/OLSIV\_2panels3.tex |
| Figure 1 | n.a. (no code) |  |  |
| Figure 2a | code/figures.do | 1 | output/new\_bank\_1875\_wohl.png |
| Figure 2b | code/figures.do | 1 | output/MA\_1875\_theta4\_wohl.png; |
| Figure 2c | code/figures.do | 1 | output/new\_bank\_7080\_wohl.png |
| Figure 2d | code/figures.do | 1 | output/diff\_MA4\_wohl.png |
| Figure 3 | code/figures.do | 42 | output/covar\_balance.pdf |
| Figure 4a | code/figures.do | 142 | output/ratio\_descp\_halfdecade.png |
| Figure 4b | code/figures.do | 159 | output/patent\_persist\_jfe.pdf |
| Figure 4c | code/figures.do | 226 | output/manu\_prod\_persist\_jfe.pdf |

**“code”:**

1. “main.do”:
	* This runs all of the code to construct the data and run the analysis
	* users need to set their directory at the top using the global macro “filepath”
2. “make\_data.do”:
	* This code contains 2 sections: the first part creates the MMA (monetary market access) dataset “**MA\_7080.dta**”; the second part creates the main sample for main regression and robustness test “**Mainsample.dta**”; the third part creates the history patent data for event study “**HistPat\_event.dta**”; the fourth part creates the data for mapping; the fifth part creates data for appendix figure: discount of state bank.
3. “tables.do”:
	* This code contains the analysis code to reproduce the tables in the main body and the online appendix. The code for each table is self-contained.
4. “figures.do”:
	* This code contains the analysis code to reproduce the figures in the main body and the online appendix. The code for each figure is self-contained.

**“data”:**

1. Change in monetary market access from 1875 to 1885 for town $i$ and state $s$ ($ΔMMA\_{i,s}$) and its variations $ΔMMA\_{-O}$, $ΔMMA\_{-od25}$

$$MMA\_{o}=\sum\_{d}^{} μ\_{od}^{-ζ}ϕ\_{od,1870}^{-θ}N\_{d} \left(1\right)$$

In equation (1), $N\_{d}$ is the adjusted population of each destination d from Hornbeck Rotemberg (2021); $μ\_{od}$ is the monetary transaction costs; $ϕ\_{od,1870}$ is the physical transport cost in 1870; $ζ$ is the monetary trade elasticity (set to 1); $θ$ is the overall trade elasticity with respect to physical transport costs.

* **“cost\_7080.dta”:** this dataset is created from “occ1875\_uniquetown\_output.dta”[[1]](#footnote-1), “occ1886\_uniquetown\_output.dta”[[2]](#footnote-2), “gaz1990countydistance`dist'miles.dta”[[3]](#footnote-3) and “cost\_708090.dta”[[4]](#footnote-4); this dataset creates the bilateral matrix of trade costs (monetary cost and physical transport cost) between all $od$ pairs and allows us to create the main measurement – MMA for any location $o$.
	+ “fip\_o”: fips code of originating county
	+ “fip\_d”: fips code of destination county
	+ “cost1870”: direct transportation cost in 1870s
	+ “cost1880”: direct transportation cost in 1880s
	+ “dist`x’”: indicator if $o$ and $d$ are within radius `x’; `x’ can be 25 miles, 50 miles, and 100 miles
	+ “ind\_same”: indicator if $o$ and $d$ are actually the same county, defined as 1 if not
	+ “mu\_od75” : monetary transaction cost in 1870s
	+ “mu\_od85” : monetary transaction cost in 1880s
	+ “mu\_od85\_noto”: monetary transaction cost in 1880s taking out the impact of the new 1886 national banks to one’s own county (not o)
	+ “mu\_od8\_notod`x' ”: monetary transaction cost in 1880s taking out the impact of the new 1886 national banks in own county and counties within 25, 50, 100 miles (not o and not d within `x’ miles)
* “**MA\_7080.dta**”: created from “cost\_7080.dta” and “adjustedpopulations\_708090\_wide”[[5]](#footnote-5)
	+ “fip\_o”: fips code of county o
	+ “totpop1870”: county population in 1870 $N\_{d}$
	+ “totpop1880”: county population in 1880 $N\_{d}$
	+ “MA\_1875\_theta`theta'” : 1875’s MMA (monetary market access calculated) calculated from equation (1) based on different choices of trade elasticities
	+ “MA\_1886\_theta`theta'\_75rail” : 1880’s MMA (monetary market access) calculated from equation (1) based on the railroad network of 1870s and different choices of trade elasticities theta. – this is the main measurement in main regression tables $ΔMMA$
	+ “MA\_1886\_theta`theta'\_noto75rail” : 1880’s MMA (monetary market access calculated) using the version of monetary transaction cost taking out the impact of the new 1880s national banks to one’s own county (base on the railroad network of 1870s) – this is the main measurement in main regression tables $ΔMMA\_{-O}$
	+ “MA\_1886\_theta`theta'\_notod`d'” : 1880’s MMA (monetary market access) calculated using the version of monetary transaction cost taking out the impact of the new 1880s national banks in own county and counties within d = 25, 50, 100 miles (based on the railroad network of 1870s) – this is the main measurement in main regression tables $ΔMMA\_{-od25}$
	+ “MA\_1886\_theta`theta'\_85rail” : 1880’s MMA (monetary market access) calculated from equation (1) based on the railroad network of 1880s and different choices of trade elasticities ($ΔMMA\_{rail80})$
	+ “tMA\_1875\_theta`theta'” : physical transportation cost tMA in 1875
	+ “tMA\_1886\_theta`theta'” : physical transportation cost tMA in 1886
	+ “diff\_MA\_85rail`theta'”: change in MMA between 1875 and 1885 based on the railroad network of 1880s
	+ “diff\_MA\_75rail`theta'”: change in MMA between 1875 and 1885 based on the railroad network of 1870s
	+ “diff\_MA\_noto75rail`theta'”: change in MMA between 1875 and 1885 based on the railroad network of 1870s using the version of monetary transaction cost taking out the impact of the new 1886 national banks to one’s OWN county
	+ “diff\_MA\_notod`d'\_75rail`theta'”: change in MMA between 1875 and 1885 based on the railroad network of 1870s using the version of monetary transaction cost taking out the impact of the new 1886 national banks in own county and counties within d = 25, 50, 100 miles
	+ “diff\_tMA\_`theta'”: change in transportation cost tMA between 1875 and 1885
1. Real Economic Outcomes: created from the Censuses of Agriculture and Manufacturing from 1870 to 1890: “temp\_census\_ma7080.dta” and railroad data “orig\_sample.dta”
* “**Mainsample.dta**”:
	+ “stateid”: indicator of state fixed effect
	+ “countyid”: indicator of county fixed effect
	+ “weight80”: the share of the county population within the town
	+ “pop\_6k\_low”: indicator of town’s population number is smaller than 6k threshold in 1880 census
	+ “pop7080”: population change from 1870 to 1880
	+ “log\_MA\_cost70”: log of transportation market access cost (tMA) in 1870s
	+ “rr\_1875”: Railroad numbers in 1875
	+ “lines76”: State bank numbers in 1876
	+ “ind\_new”: indicator of presence of a national bank in 1880s
	+ “lloans”: log value of lending by national banks in 1885
	+ “diff8090cap21\_county\_prod” : Change in per capita (male population over age 21) value of total manufacturing and agricultural production from 1880 to 1890 -- **Tradeables production**
	+ “diff\_tradefrac” : change in the intensity of tradables goods production using the share of production in commodities goods in total agricultural production from 1880 to 1890 (commodities defined as those listed on the Chicago Board of Trade, which were grains including wheat, oats, buckwheat, and corn.) -- **Commodities share**
	+ “diff8090cap21\_manu\_prod”: change in per capita (male population over age 21) manufacturing production from 1880 to 1890 -- **Manu production**
	+ “diff8090cap21\_manu\_inputs”: change in per capita (male population over age 21) manufacturing inputs from 1880 to 1890 -- **Manu inputs**
	+ “diff\_manu\_share”: change in the share of production in the manufacturing sector from 1880 to 1890 -- **Manu production share**
	+ “diff8090cap21\_manu\_empl”: change in the share of employment in the manufacturing sector (calculated as manufacturing employment divided by male population over age 21) from 1880 to 1890 -- **Manu employment share**
	+ “cap21\_county\_prod70”/“cap21\_county\_prod80”: per capita (male population over age 21) value of total manufacturing and agricultural production in 1870/1880
	+ “bush\_tradefrac\_1870”/“bush\_tradefrac\_1880”: intensity of tradables goods production using the share of production in commodities goods in total agricultural production in 1870/1880
	+ “cap21\_manu\_prod\_1870”/“cap21\_manu\_prod\_1880”: per capita (male population over age 21) manufacturing production in 1870/1880
	+ “cap21\_manu\_inputs\_1870”/“cap21\_manu\_inputs\_1880”: per capita (male population over age 21) manufacturing inputs in 1870/1880
	+ “manu\_share\_1870”/“manu\_share\_1880”: share of production in the manufacturing sector in 1870/1880
	+ “cap21\_manu\_empl\_1870”/“cap21\_manu\_empl\_1880”: share of employment in the manufacturing sector (calculated as manufacturing employment divided by male population over age 21) in 1870/1880
1. History Patent Data: this is created from
* “**HistPat\_event.dta**”:
	+ “year\_halfdecade”: half decadal bin
	+ “ratio”: cumulative growth of patent number relative to the base years (1860–1865)
	+ “norm\_ratio”: cumulative growth of patent number (normalized to equal 1 in 1880) relative to the base years (1860–1865) for each town
	+ “wratio”: winsorized cumulative growth of patent number (normalized to equal 1 in 1880) relative to the base years (1860–1865) for each town
1. Data source: Bank information from Annual Report of the Comptroller of the Currency 1875 [↑](#footnote-ref-1)
2. Data source: Bank information from Annual Report of the Comptroller of the Currency 1886 [↑](#footnote-ref-2)
3. Data source: NBER county distance information, 1990 Census gazetteer files for counties [↑](#footnote-ref-3)
4. Data source: Counties’ physical trade costs with railroad access in 1875 and 1880 (Atack, 2016) and transportation market access in 1870 and 1880 (Donaldson and Hornbeck, 2016; Hornbeck and Rotemberg, 2021). [↑](#footnote-ref-4)
5. Data source: Town and city populations from the original reports of the 10th and 11th Decennial Censuses of Population that report information covering the decades 1860 to 1880 [↑](#footnote-ref-5)