Internet Appendix for "The Political Economy of Financial Regulation: Evidence from U.S. State Usury Laws in the 19th Century"*

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This appendix contains tables and a figure that supplement the analysis in the published article. Table IA.I displays additional descriptive information on maximum legal rates and penalties for usury in 1850. Table IA.II reports the correlations between various market's interest rates, and Table IA.III analyzes the relation between the penalty index and state-level measures of political power. Section I offers several quotes from legislators to highlight the mindset and arguments of regulators in the 19th century. Section II and figure IA.1 present evidence that rate ceilings were indeed binding and restrictive during the 19th century. In section III and Table IA.IV we provide additional evidence on the link between usury laws and public interest using agriculture shocks as proxies for the public interest view that financial regulation may provide a form of social insurance. Finally, section IV details the construction of the economic growth measures used in the paper.

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I. The Mindset of Regulators in the 19th Century

Several quotes from legislators at the time highlight the mindset and arguments of regulators in the 19th century. In a stirring speech against usury laws in the Massachusetts legislature, Richard Henry Dana pointed to the link between rent-seeking behavior and usury laws.

> *The borrower is no longer the trembling suppliant at the threshold of the patrician lender. Who are the borrowers now? The railroad, manufacturing, steam-boat and mining corporations. They are borrowers,– those great corporations that are suspected of* **controlling the politics of our States and towns.** *[emphasis added] The States and National Governments are borrowers. All mercantile enterprises require loans of credit; and the great merchants and manufacturers are borrowers one day and lenders the next. The great builders are borrowers.*
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> *Again, it is not the poor mechanic that is the borrower. The journeymen the member from Boston employs, are not borrowers. Hired laborers in this country seldom are. It is mostly enterprise that borrows, and capital borrowing more capital.* (Dana (1867) pp. 20-21.)

Concerns about the relation between the competitiveness of credit markets and usury laws were reflected in the arguments of those in favor of repealing usury laws in the 19th century.

> *The only practical objection to the repeal, seemed to me to be, the fear that the banks of discount might combine and keep up an artificial rate of interest. I have made careful inquiries on this subject, and am satisfied that there is no more practical danger on that head, than the community must always incur in its financial transactions. The banks are numerous. There will be competition among them. And there is not only the competition of private lenders at home, but competition from abroad. Capital is drawn toward demand. State lines and town lines are disregarded. Loans are made in a few minutes by telegraph; and it will more and more be the case that, when an inadequacy of supply to the demand, or a combination of lenders had raised the rate of usance, an influx from abroad will bring it to its natural level.* (Dana (1867) pp. 22-23.)

Legislators argued that usury laws had financial and economic consequences for state economic growth. For example, in 1867 during a discussion of the usury bill in Virginia, and following the request of several members of the Virginia Senate, John Harmer Gilmer published an opinion paper entitled "What is the Effect of the Usury Laws?" He writes:

> *Virginia in the past has been almost exclusively an agricultural and planting community. It may be unnecessary to pause here to inquire into the causes that gave her this complexion, or to show why it is that the boundless wealth, nature bestowed upon her in her water power and minerals, has been allowed to remain in unprofitable idleness;*

but I think he who examines the question will not deem the assertion, that the spirit of her usury laws was at least one of the original causes – very extravagant. She undoubtedly possesses as many of the elements essential to successful manufacture as any other section of the continent, and her people have for centuries trodden beneath their feet such riches as in other communities would have made the land teem with the opulence of cities, railroads and canals. But be this as it may, the fortunes of the state took this direction as an early day in her history, and she has since made but little advance in wealth or power. (Gilmer (1867) pp. 14.)

II. Are Rate Ceilings Restrictive?

Figure IA.1 plots the average state-level bank lending rate for states with and without a rate ceiling, the average rate ceiling for states with rate limits, the minimum rate ceiling among states, and the commercial paper rate annually from 1878 to 1891. The financial crisis of 1884 is highlighted on the figure. The figure shows that prior to the financial crisis of 1884, average bank lending rates in states with usury restrictions are considerably lower than those in unconstrained states, and much closer to the commercial paper rate, a rate available to only the largest and most creditworthy borrowers. Once the financial crisis of 1884 hits, however, these states loosen their rate ceilings, as evidenced by the increase in their average rate ceiling, and consequently their average bank lending rates jump to the same level as those in unconstrained states. The figure suggests that even toward the end of the 19th century, usury laws are binding for some borrowers and that the financial crisis was the catalyst to loosen regulation—a theme we highlight throughout the paper.

Figure IA.1 about here

III. Usury Laws and Public Interest: Evidence from Agricultural Shocks

The third set of proxies for public interests we employ are a series of agricultural shocks. According to Prediction 8, usury laws should smooth idiosyncratic shocks. The evidence presented previously on market interest rates, financial crises, and state competition for capital are aggregate shocks. To test Prediction 8, we employ shocks to the agricultural sector in each state that had little to no effect on the industrial sector, causing an idiosyncratic distortion to one sector of the economy.

We obtain a set of agricultural technology shocks from "A History of American Agriculture" from the United States Department of Agriculture (USDA) from 1800 to 1891. We assign an indicator variable to state-years experiencing a technological shock (positive or negative) to the agricultural sector. We employ the nearest year for which we can find data on agricultural production across various crops to determine which states are exposed to which crops and match the technology shock affecting those crops (e.g., invention of the cotton gin on cotton-producing states). We also include a one-year lag of the shock to account for any additional time needed to alter regulation. As the first column of Table IA.IV shows, the relation between agricultural technology shocks and usury laws is negligible, though the sign is in the predicted direction for the public interest story.

We also employ a series of extreme weather shocks that adversely affect agriculture. Similar to the assignment of technology shocks, we identify which states are most exposed to the weather event and how much their particular agricultural sector is affected by the event based on its crop production (e.g., Mississippi River flood of 1849, which affected states along the river, particularly in the South). We assign a value of one to these state-years and zero otherwise. As the second column of Table IA.IV shows, there is no significant relation between weather shocks to the agricultural sector and usury laws, though again the sign is in the predicted direction.

Finally, we also employ a series of commodity price shocks using the Froot, Kim, and Rogoff (1995) commodity price series from England and Holland, which spans the 17th, 18th, and 19th centuries, and supplement these series with data from the NBER Macrohistory database. Froot, Kim, and Rogoff (1995) describe the construction of their series, which is provided in both nominal and real terms for the following commodities: wheat, oats, eggs, cheese, butter, barley, and peas. We take an equal-weighted average of the English and Dutch prices of each commodity in each year. The NBER data we use add corn and cotton prices, but only cover the periods 1860 to 1891 and 1870 to 1891, respectively. We assign the exposure of each state to each of these commodities at different points in time using the most recent available data we can find on the composition of the state's agricultural sector.[1] We assign the absolute value of commodity price changes to the state based on a state's weighted average exposure to the commodities in that year.

[1]When we do not find "hard data", we employ historical documents that indicate, for example, "Minnesota, California, and Illinois were the chief wheat states in 1890" and assign an exposure of one for these states to the respective commodity in the relevant years. Statements and data pertaining to "grains" are assigned equally to oats and barley prices, information on "dairy" is assigned equally to cheese and butter prices, and information on "vegetables" is assigned to prices for peas.

The third column of Table IA.IV reports results for the 1800 to 1891 period for which we have commodity price data. Although the sign of the coefficient is consistent with Prediction 8, the result is not significant. Since we only have corn and cotton prices starting in 1870, we repeat the previous test over the 1870 to 1891 period, for which we have a complete set of commodity prices. Here, we obtain a negative and statistically significant effect consistent with Prediction 8, which posits that usury laws tighten following idiosyncratic shocks. The last two columns of Table IA.IV include all three agricultural shocks in a multivariate regression over the 1800 to 1891 and 1870 to 1891 periods. All three shocks result in lower maximum rates, consistent with Prediction 8. The evidence provides mild support for the public interest view of Glaeser and Scheinkman (1998) if these agricultural shocks are idiosyncratic to other sectors and if usury laws help smooth them.

IV. Construction of Economic Growth Measures

To the best of our knowledge there are no existing measures of state-level economic activity for the 19th century that are equivalent to their modern counterparts. We collect data from the seventh (1850), eighth (1860), and ninth (1870) census reports to construct local measures of economic activity. Before the seventh census it was difficult to obtain reliable data on economic activity, and thus the period 1850 to 1860 is the earliest period for which data exists and usury laws were in effect and important. We construct five different measures of economic activity growth at the state level: population, state gross product, manufacturing value added, establishments, and employment.

A. Construction of Agricultural Production Variables for 1849 and 1859

For 1849, nominal values for agricultural production are given in the census; however, the census reports only quantities (and not nominal values) for many commodities in 1859. To construct total agricultural production in 1849, we sum across all commodities for which we have prices in 1859 in order to construct comparable measures that cover an identical set of commodities.

Since for 1859 only real values are reported for agricultural production, we construct nominal values in the following manner. We obtain the average annual price for each commodity in 1859 by averaging prices from five markets (Philadelphia, New York, New Orleans, Cincinnati, Charleston). We then form nominal production for each commodity by multiplying the reported quantity by the average annual price. The total production includes production of the following commodities: corn,

wheat, cotton, oats, butter, wool, tobacco, cane sugar, rye, orchard products, rice, hops, clover seed, cheese, peas and beans, flaxseed, flax, hemp, molasses, and wine. Significant commodities for which no price data are found, and which consequently are excluded from our agricultural production measure, are: hay, irish potatoes, and sweet potatoes.[2]

The rate of growth of the number of farms in each state by farm size (acreage) for the years 1860, 1870, 1880, and 1890 is obtained from the U.S. Census in each of those years. The number of farms is recorded for acreage less than 10 acres; for acreage between 10 and 20 acres; for acreage between between 20 and 50 acres, 50 and 100, 100 and 500, and 500 and 1,000 acres; for acreage more than 1,000 acres. We compute growth rates in farms per capita over the decade between census years.

B. Construction of Gross State Product for 1849 and 1859

Gross state product is formed by summing total agricultural production (as described above), manufacturing annual product and the value of animals slaughtered. Stock variables that are measured in 1850, but not converted to a flow to be included in the gross state product due to lack of stock data in 1840 are live stock, business capital stock, and railroad stock (as measured by cost of construction).

C. Construction of Manufacturing Value Added for 1849 and 1859

Manufacturing value added is formed by subtracting the value of raw materials used in manufactured goods from the annual product generated by the sale of those manufactured goods.

[2]Sources for agricultural commodity prices are Bezanson, Anne , Robert D. Gray, and Miriam Hussey, 1937, '*Wholesale Prices in Philadelphia 1784-1861. Part II,* (University of Pennsylvania Press, Philadelphia PA) and Cole, Arthur Harrison, 1938, *Wholesale Commodity Prices in the United States 1700-1861,* (Harvard University Press, Cambridge MA).

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Table IA.I
Maximum Legal Interest Rate and Penalty for Usury in 1850

This table reports the maximum legal interest rate and penalty for usury for each state in 1850. State penalties for violating the maximum rate are levied along five dimensions: voiding the contract, forfeiting interest and/or principal, and loss of interest and/or principal. Each of these dimensions is coded with a value, where zero implies no penalty and one implies total forfeiture or loss. If a state seizes some fraction of the value, then that fraction is coded. In some cases more than 100% of the value is lost or forfeited, in which case the value is set to greater than one. An index of the severity of penalties adopted by the state is constructed as the sum of these measures across all five dimensions of the usury penalty code.

State	Maximum Rate	Contract Void?	Loss of interest	Loss of Principal	Forfeiture of Principal	Forfeiture of interest	Total
Connecticut	6%	0.0	1.0	0.0	0.0	0.0	1.0
Delaware	6%	0.0	1.0	1.0	0.0	0.0	2.0
District of Columbia	6%	0.0	1.0	1.0	0.0	0.0	2.0
Indiana	6%	0.0	0.0	0.0	0.0	1.0	1.0
Kentucky	6%	0.0	0.5	0.0	0.0	0.0	0.5
Maine	6%	0.0	0.5	0.0	0.0	0.0	0.5
Maryland	6%	0.0	1.0	1.0	3.0	0.0	5.0
Massachusetts	6%	0.0	0.0	0.0	0.0	1.5	1.5
Missouri	6%	0.0	0.0	0.0	0.0	1.0	1.0
New Hampshire	6%	0.0	0.0	0.0	0.0	1.5	1.5
New Jersey	6%	1.0	1.0	1.0	0.0	0.0	3.0
North Carolina	6%	1.0	1.0	1.0	2.0	0.0	5.0
Ohio	6%	0.0	1.0	1.0	0.0	0.0	2.0
Pennsylvania	6%	0.0	0.0	0.0	1.0	0.0	1.0
Rhode Island	6%	0.0	1.0	0.0	0.0	0.0	1.0
Tennessee	6%	0.0	0.5	0.0	0.0	0.5	1.0
Vermont	6%	0.0	0.5	0.0	0.0	0.0	0.5
Virginia	6%	1.0	1.0	1.0	2.0	0.0	5.0
6% rate avg.		0.17	0.61	0.39	0.44	0.31	1.92
Georgia	7%	0.0	1.0	0.0	0.0	0.0	1.0
New York	7%	1.0	1.0	1.0	0.0	0.5	3.5
South Carolina	7%	0.0	1.0	0.0	0.0	0.0	1.0
7% rate avg.		0.33	1.00	0.33	0.00	0.17	1.83
Alabama	8%	0.0	1.0	1.0	1.0	1.0	4.0
Florida	8%	0.0	1.0	0.0	0.0	0.0	1.0
Louisiana	8%	0.0	1.0	0.0	0.0	0.0	1.0
Mississippi	8%	0.0	1.0	0.0	0.0	0.0	1.0
8% rate avg.		0.00	1.00	0.25	0.25	0.25	1.75
Arkansas	10%	1.0	1.0	1.0	0.0	0.0	3.0
Illinois	10%	0.0	0.0	0.0	0.0	1.5	1.5
Iowa	10%	0.0	0.0	0.0	0.0	0.5	0.5
Michigan	10%	0.0	0.5	0.0	0.0	0.0	0.5
10% rate avg.		0.25	0.38	0.25	0.00	0.50	1.38
Texas	12%	0.0	1.0	0.0	0.0	0.0	1.0
California	no limit	0.0	0.0	0.0	0.0	0.0	0.0
Minnesota	no limit	0.0	0.0	0.0	0.0	0.0	0.0
Wisconsin	no limit	0.0	0.0	0.0	0.0	0.0	0.0

Table IA.II
Market Interest Rates and Binding Usury Ceilings

This table reports correlations between various market interest rates: yields on long-term British government securities, the yields of high-grade long-term American bonds, the average annual U.S. commercial paper rate, New England municipal bond yields, high-grade railroad bond yields, and the average annual call money rate, which is the overnight lending rate between banks in New York on collateralized loans. None of these rates were subject to usury laws. Data are from Homer (1963). All series are annual (call money rates are available monthly) and end in 1891 to coincide with our usury law data. The series begin at different dates indicated below. An index of interest rates is constructed by weighting each series using the principal components of the covariance matrix of the six interest rates. Also reported are average state-level bank lending rates from 1878 to 1891 from Bodenhorn (2003), obtained from the Comptroller of the Currency. Correlations with the state GDP-weighted average of the bank lending rates are reported.

	U.K. bonds	U.S. bonds	Commercial paper	NE municipal	Railroad bonds	Call money rate	Principal component index	State loan rate
Sample begins:	*1727*	*1798*	*1831*	*1798*	*1857*	*1857*	*1857*	*1878*
U.K. bonds	1.00	0.81	0.50	0.86	0.88	0.34	0.77	0.14
U.S. bonds		1.00	0.45	0.79	0.86	0.40	0.75	0.39
CP			1.00	0.73	0.74	0.91	0.91	0.48
NE municipal				1.00	0.98	0.55	0.94	0.42
Railroad bonds					1.00	0.57	0.95	0.38
Call money						1.00	0.77	0.45
PC index							1.00	0.64

Table IA.III
Penalties for Violating Usury

The table reports results from regressing the penalty index for usury for a state in a given year annually from 1641 to 1891 on a dummy for financial crisis years (1857, 1873, and 1884) and the year following each crisis, the contemporaneous average penalty index of states that border it, a dummy variable indicating whether the state had restricted suffrage laws that only allowed land owners and/or those who paid taxes to vote, and indicator variables for industrial and bank incumbent power and egalitarian law. Regressions are estimated with year and/or state-level fixed effects and include age as a regressor. Standard errors used to compute t-statistics (reported in parentheses) are calculated assuming group-wise clustering at the state level. Adjusted-R^2s are reported for the full specification that includes the fixed effects as well as the amount of remaining variation explained by the regressors after the fixed effects are accounted for ($\bar{R}^2$ after F.E.).

	Dependent variable = Penalty index for violating usury				
Crisis	-0.484				
	(-6.28)				
Penalty of border states$_t$		0.938			
		(5.69)			
Restricted suffrage			0.497		
			(2.44)		
Incumbent power				0.628	
				(3.59)	
Egalitarian law				-0.572	
				(-1.53)	
Industrial incumbent power					0.526
					(5.05)
Bank incumbent power					-1.026
					(-0.69)
Egalitarian law					-0.431
					(-2.50)
Fixed effects:					
Year?	no	yes	yes	no	no
State?	yes	yes	yes	yes	yes
$\bar{R}^2$	0.55	0.73	0.64	0.55	0.58
$\bar{R}^2$ after F.E.	0.10	0.29	0.04	0.09	0.12
N	3,715	3,715	3,715	3,715	2,257
Cluster	state	state	state	state	state

Table IA.IV
Proxies for Public Interests: Agricultural Shocks

This table reports results for proxies for public interests from using a series of agricultural shocks: agricultural technology shocks, obtained from "A History of American Agriculture" from the United States Department of Agriculture (USDA) from 1800 to 1891, extreme weather shocks from 1800 to 1891, a series of commodity (absolute) price shocks using the Froot, Kim, and Rogoff (1995) commodity price series from England and Holland, which spans the 17th, 18th, and 19th centuries, and data from the NBER Macrohistory commodity price series on corn, cotton, and wheat from 1870 to 1891. We assign the exposure of each state to each of the shocks at different points in time using the most recent available data we can find on the composition of the state's agricultural sector. Regressions are esimated with year and/or state-level fixed effects and include state age (state-specific time trend) as a regressor. Standard errors used to compute t-statistics (reported in parentheses) are calculated assuming group-wise clustering at the state level. Adjusted-R^2s are reported for the full specification that includes the fixed effects as well as the amount of remaining variation explained by the regressors after the fixed effects are accounted for ($\bar{R}^2$ after F.E.).

Dependent variable =	ΔMaximum legal interest rate					
Sample period	1800-1891	1800-1891	1800-1891	1870-1891	1800-1891	1870-1891
Technology shocks	-0.040				-0.015	-0.122
	(-0.48)				(-0.18)	(-0.30)
Weather shocks		-0.035			-0.132	-0.298
		(-1.01)			(-2.04)	(-2.55)
Commodity price shocks			-0.295	-0.765	-0.299	-0.800
			(-1.59)	(-2.09)	(-1.59)	(-2.24)
Fixed effects:						
Year?	yes	yes	yes	yes	yes	yes
State?	yes	yes	yes	yes	yes	yes
State time trend:	yes	yes	yes	yes	yes	yes
$\bar{R}^2$	0.05	0.05	0.05	0.07	0.05	0.07
$\bar{R}^2$ after F.E.	0.01	0.01	0.01	0.01	0.01	0.01
Cluster	state	state	state	state	state	state
N	2,615	2,615	1,582	511	1,582	511

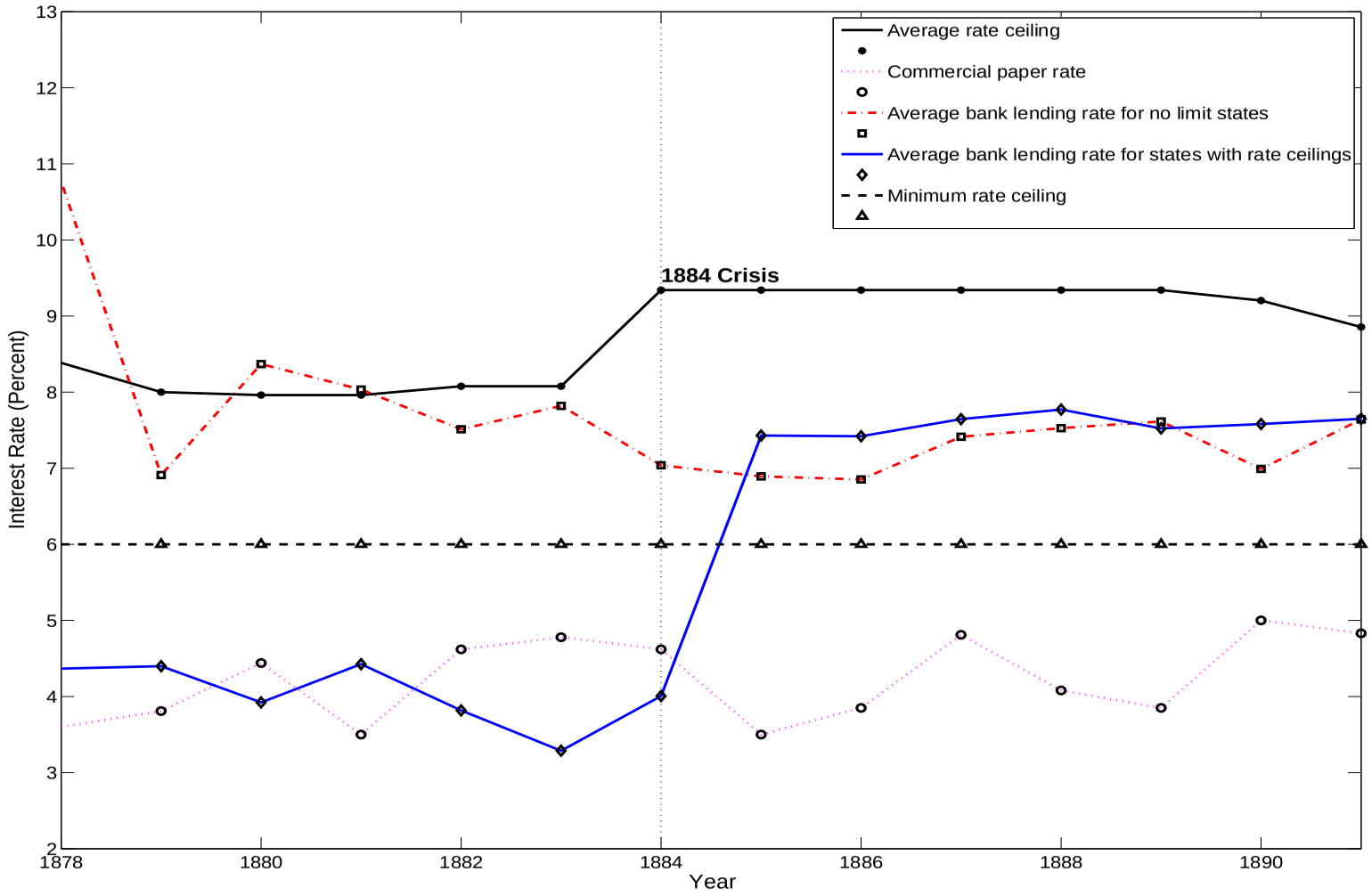

Figure IA.1. State-Level Bank Lending Rates for States with and without Rate Ceilings (1878 to 1891)