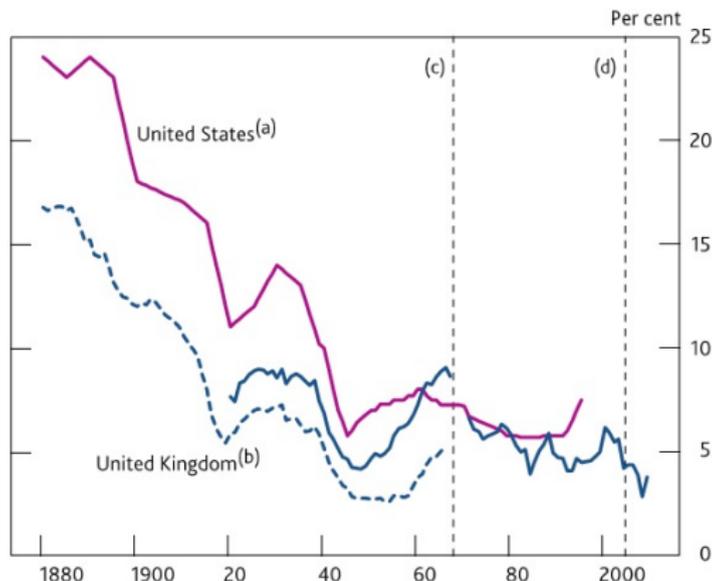




# Historical Evolution of Capital Ratios

Bank of England – Financial Stability Report (Dec. 2009)



*“An improvement in the quality of banks capital needs to be accompanied by a higher aggregate level of capital relative to the size and riskiness of the banking system. The period since the 1960s has seen a trend decline in banks capital buffers. That trend now needs to be reversed.”*

# Motivation, Lever, and Results

## 1. Questions

- ▶ How did balance sheets of **state banks** evolve during the National Banking Era?
- ▶ How did proxies for systemic risk display trends during the NBA era?
- ▶ Is there a role of “off-balance sheet liquidity” during disruptions?

## 2. Methods

- ▶ Digitize bank-level balance sheets from state banks from New York
- ▶ Quarterly data set, from 1868 – 1900 (with breaks)
- ▶ Development of a novel measure of bank capital in NBA era – **net** of D&O loans

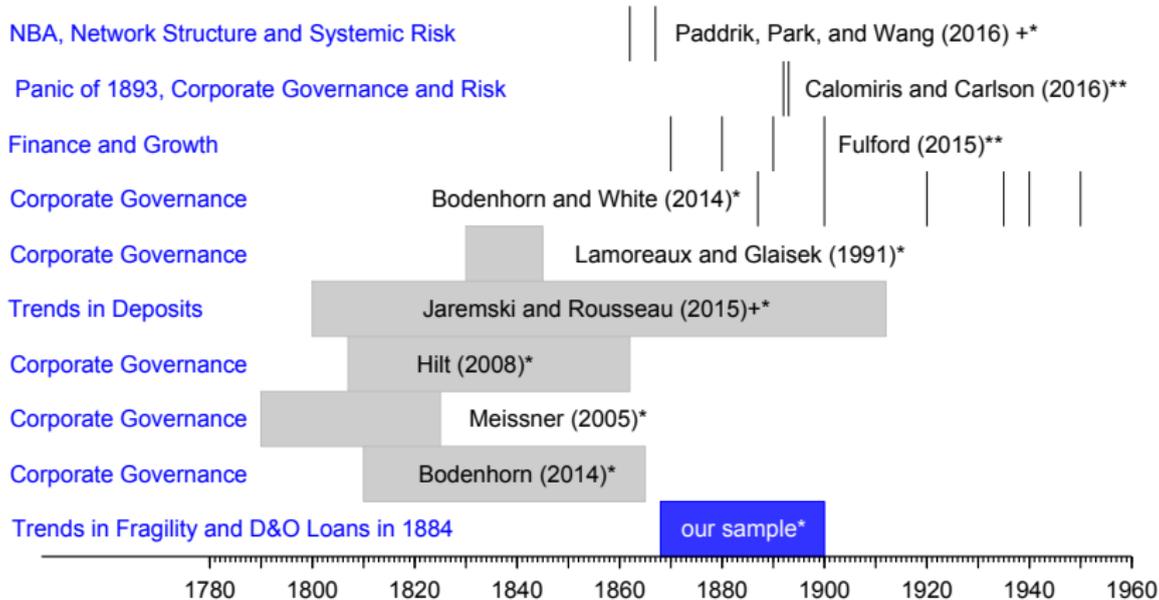
## 3. Findings

- ▶ Interconnectedness as measured by due to other FIs rises (6%  $\Rightarrow$  12%)
- ▶ Asset concentration in the largest state banks falls (55%  $\Rightarrow$  25% for top 5)
- ▶ Potential vulnerability increases throughout as proxied by capitalization
- ▶ “Off-balance sheet liquidity” by D&O loan repayments during 1884 disturbance

# Relation to the Literature

(Small) Sample of Related Papers - Research Focus and Sample Periods

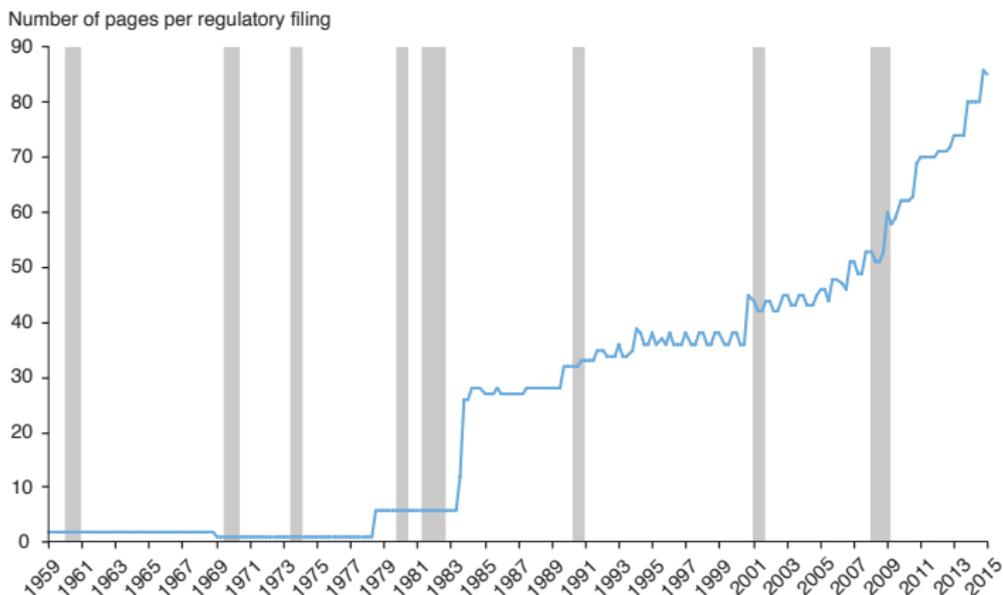
## Research Area



**Notes:** \*) State Banks Only, \*\*) National Banks Only, +\*) State and National Banks.

**Source:** Koch and Van Horn (2016).

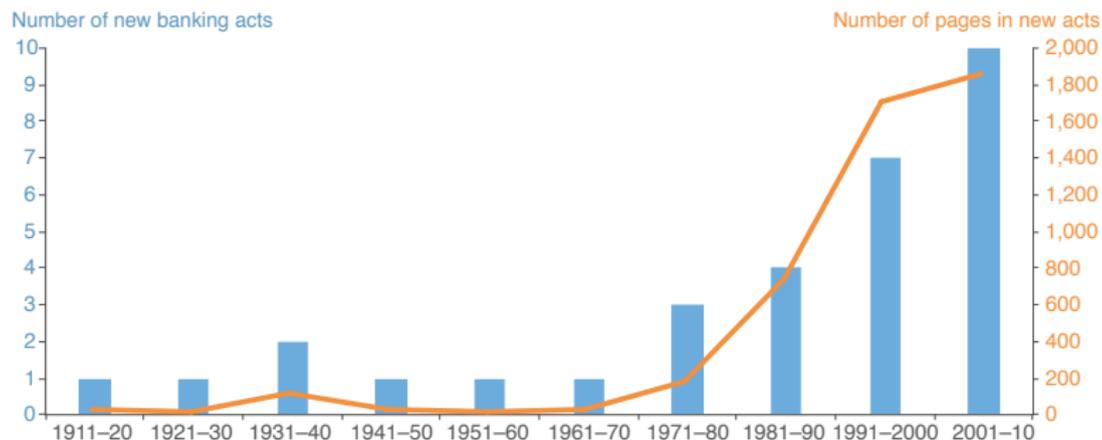
# Regulatory Constraints $\uparrow \Rightarrow$ Institutional Variation $\downarrow$



NOTES: Gray bars indicate recessions. Maximum number of report pages for domestic banks only.  
1959:Q4–1983:Q4 Forms FFIEC 010, FFIEC 011, FFIEC 012, FFIEC 013, FFIEC 015 and temporary reporting supplements.  
1984:Q1–2000:Q4: Forms FFIEC 032, FFIEC 033 and FFIEC 034.  
2001:Q1–present: FFIEC 041.

SOURCE: Federal Financial Institutions Examination Council, Call Report.

# Regulatory Constraints $\uparrow \Rightarrow$ Institutional Variation $\downarrow$



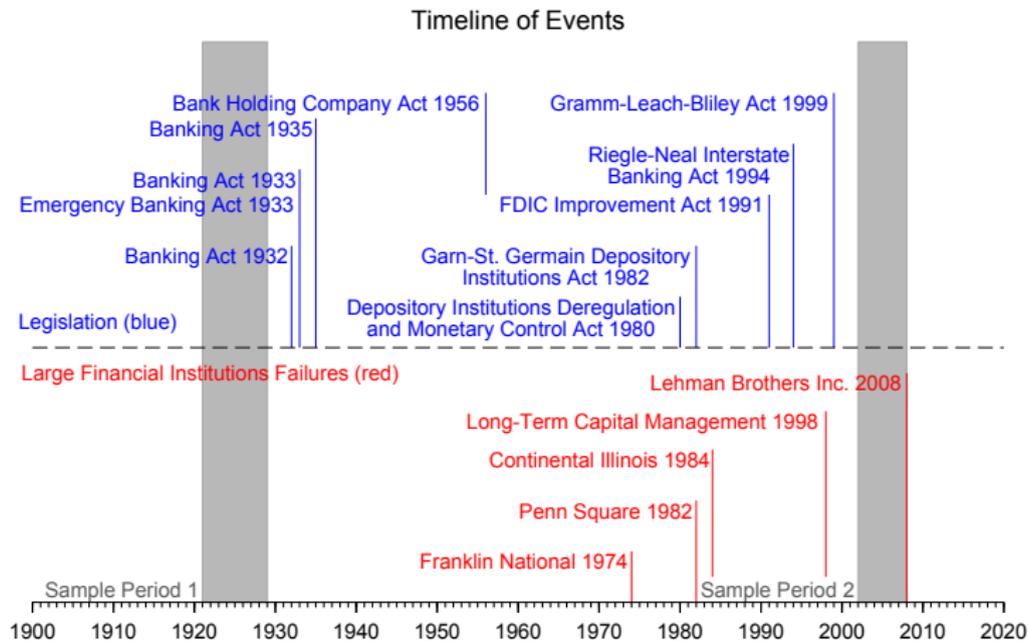
SOURCE: Federal Deposit Insurance Corporation, Important Banking Legislations.

Source: Ash, Koch, and Siems (2015)

... end up at corner solutions, say for capital, for systemically relevant institutions  
(typically “given” in models, see Bianchi and Bigio, 2016)

# Regulatory Complexity, Risk Shifting and TBTF

... reduce observable variation in governance – harder to answer empirical questions about “counterfactuals”



Source: Koch, Richardson, and Van Horn (2016)

# Leverage for SIFIs Bound by Regulatory Minimum

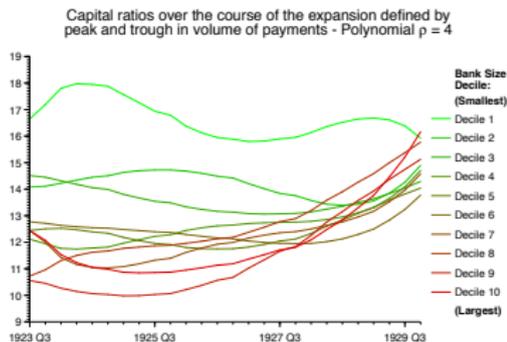


FIGURE 1. PRIOR TO THE GREAT DEPRESSION

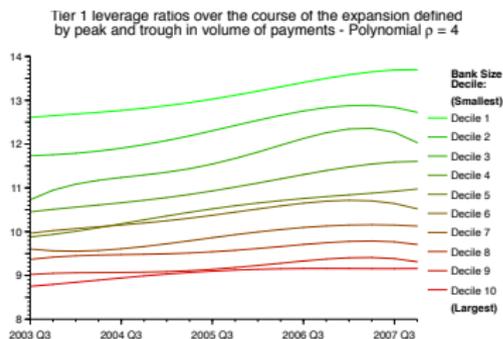


FIGURE 2. PRIOR TO THE GREAT RECESSION

**Source:** Koch, Richardson, and Van Horn (2016)

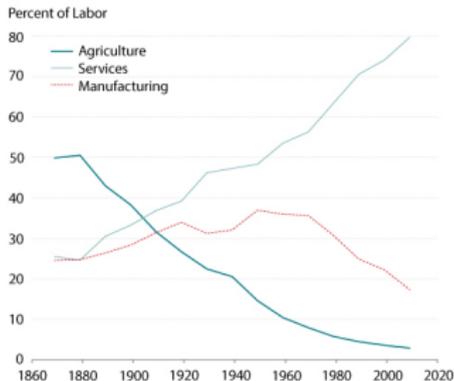


# Why New York State?

- ▶ Both industrial and agricultural
- ▶ Served in **both** rural and urban areas.
- ▶ Substantial share of U.S. total banking assets

## Structural Transformation (Goel and Restrepo-Echavarria, 2015)

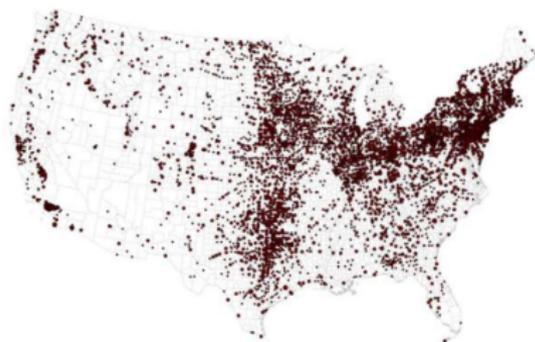
Figure 1  
Labor Shares in the United States



SOURCE: 1869-1957: Kendrick (1961); 1929-2008: the Bureau of Economic Analysis and Bureau of Labor Statistics.

## Spatial Distribution of Activity (Jaremski and Wheelock, 2015)

Figure 1: National Banks in 1914



Notes: The figure displays the location of every national bank in operation in 1914. Banks obtained from Comptroller of the Currency's Annual Report in 1914. Dot size is proportionate to the number of banks in the city.

# New York State Regulatory Policy Regimes

1. Pre-Free Banking (1776 – 1837)

2. Free Banking Era (1837 – 1864)

3. National Banking Era (1864 – 1913)

⇒ The “dual banking system”:

(i) Office of the Comptroller of the Currency regulates national banks

(ii) State regulatory agencies regulate state banks

4. The Early Years of the Federal Reserve (1914 – 1935)

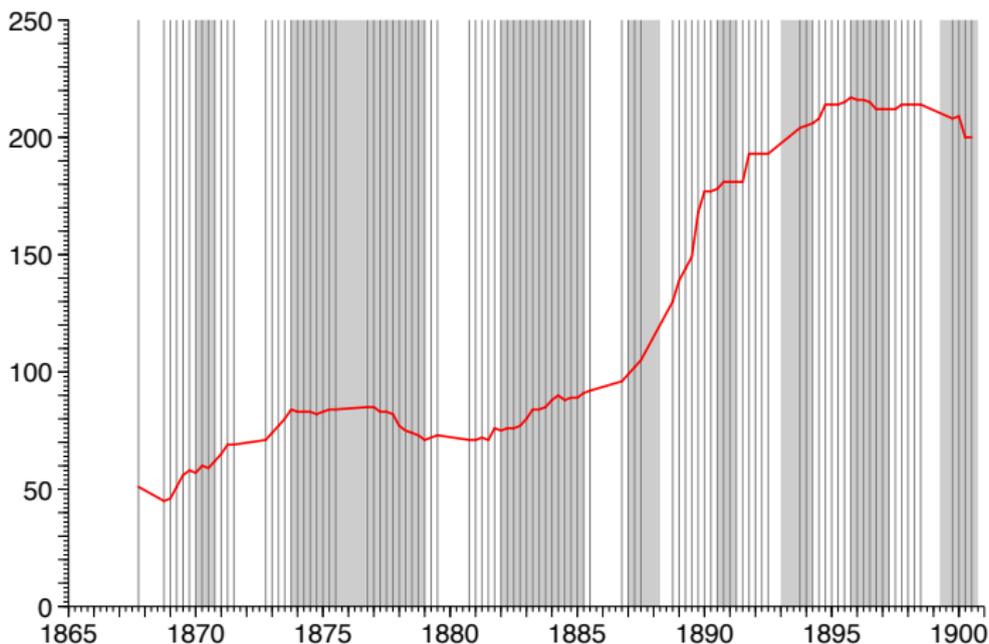






# Data Sample – New York State

## Number of Banks in the Sample



**Source:** New York Superintendent of Banks; Koch and Van Horn (2016, WP)

**Note:** Major ticks on the time-axis denote the Q1 of each year, minor ticks denote Q2, Q3, and Q4.

# Primary Source

## Annual Report of the Superintendent of the Banking Department

ANNUAL REPORT  
OF THE  
SUPERINTENDENT  
OF THE  
BANKING DEPARTMENT  
OF THE  
STATE OF NEW YORK.

TRANSMITTED TO THE LEGISLATURE JANUARY 6, 1885.

ALBANY:  
WHEO, PARSONS & COMPANY, PRINTERS.  
1886.

STATE OF NEW YORK.

No. 8.

IN ASSEMBLY,

JANUARY 6, 1885.

ANNUAL REPORT  
OF THE SUPERINTENDENT OF THE BANKING DEPARTMENT.

STATE OF NEW YORK:

BANKING DEPARTMENT,  
ALBANY, December 29, 1884.

To the Honorable the Speaker of the Assembly:

Sir—As required by law, I have the honor to herewith transmit to the Legislature the Annual Report of this Department, in relation to incorporated banks, banking associations, individual bankers and trust, loan, mortgage, security, guarantee and indemnity companies or associations.

I am, very respectfully,

Your obedient servant,

WILLIS S. PAINE,  
*Superintendent.*





# Balance Sheet Example – Small Rural Bank

## FARMERS' BANK – Fayetteville.

MYRON BANGS, *President.*

(Organized 1870.)

FRANKLIN M. SEVERANCE, *Cashier.*

RESOURCES.	Statement of condition, Dec. 11, 1880.	Statement of condition, March 12, 1881.	Statement of condition, June 18, 1881.	Statement of condition, Sept. 24, 1881.
Loans and discounts less due from directors.....	\$63,817	\$70,445	\$79,645	\$74,637
Due from directors.....	15,125	16,000	12,550	10,437
Overdrafts .....	527	1,555	750	927
Due from trust companies, State, national and private banks and brokers. . .	5,888	9,100	5,048	12,024
Real estate.....	22,350	14,350	13,100	13,100
Bonds and mortgages.....	3,976	8,976	9,386	9,386
Stocks and bonds.....	7,145	3,751	3,751	3,751
Specie .....	1,040	2,222	1,153	648
U. S. legal tender notes and circulating notes of national banks.....	2,734	3,903	3,893	3,000
Cash items .....	749	474	49	115
Loss and expense account.....	1,108	1,090	.....	48
Add for cents .....	2	2	2	3
<b>Total resources .....</b>	<b>\$124,461</b>	<b>\$131,868</b>	<b>\$129,327</b>	<b>\$128,076</b>
<b>LIABILITIES.</b>				
Capital.....	\$50,000	\$50,000	\$50,000	\$50,000
Surplus fund .....	10,000	10,000	10,000	10,000
Undivided profits .....	2,643	1,112	1,419	472
Due depositors on demand .....	61,817	70,370	66,785	67,561
Due to trust companies, State, national and private banks and brokers. . .	.....	386	1,123	42
Add for cents.....	1	.....	.....	1
<b>Total liabilities .....</b>	<b>\$124,461</b>	<b>\$131,868</b>	<b>\$129,327</b>	<b>\$128,076</b>

# Balance Sheet Example – Large New York City Bank

## BANK OF NORTH AMERICA—New York City.

WILLIAM DOWD, *President.*

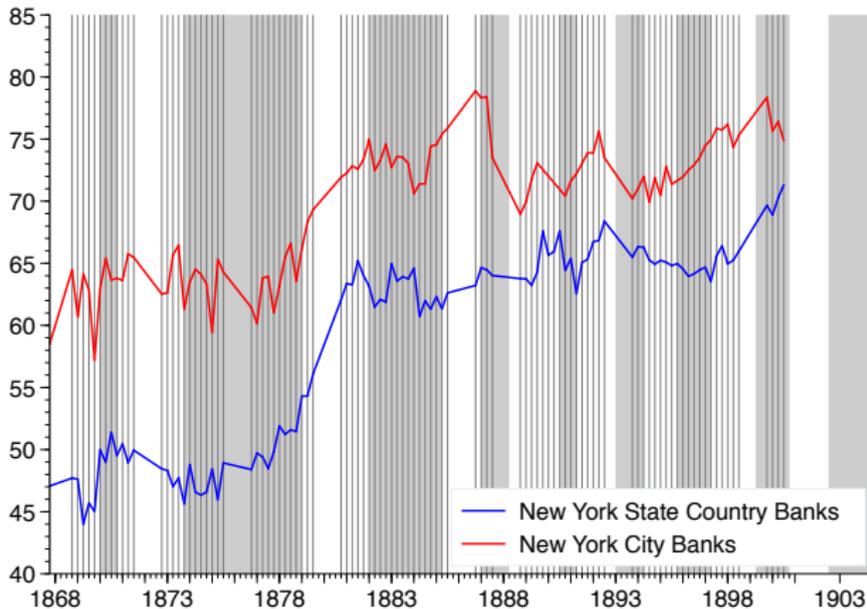
(Organized 1869.)

FREDERICK W. WHITTEMORE, *Cashier.*

RESOURCES.	Statement of condition, Dec. 11, 1880.	Statement of condition, March 12, 1881.	Statement of condition, June 18, 1881.	Statement of condition, Sept. 24, 1881.
Loans and discounts less due from directors.....	\$1,720,355	\$1,931,027	\$2,612,891	\$2,270,665
Due from directors.....	574,459	522,089	417,390	440,585
Overdrafts.....	21,749	5,582	6,730	11,629
Due from trust companies, State, national and private banks and brokers.....	279,172	119,160	144,898	137,853
Real estate.....	175,000	175,000	175,000	175,000
Bonds and mortgages.....	15,000	15,000	15,000	15,000
Stocks and bonds.....	10,775	10,775	20,975	55,775
Specie.....	471,705	211,067	562,193	176,586
United States legal tender notes and circulating notes of national banks.....	201,116	152,607	192,680	301,873
Cash items.....	3,514,790	3,148,652	3,297,673	2,652,328
Loss and expense account.....	19,538	6,284	16,391	6,882
Assets not included in either of the above heads.....	11,703	11,703	10,511	14,511
Add for cents.....	4	4	2	3
<b>Total resources.....</b>	<b>\$7,015,366</b>	<b>\$6,308,950</b>	<b>\$7,472,274</b>	<b>\$5,658,690</b>
<b>LIABILITIES.</b>				
Capital.....	\$700,000	\$700,000	\$700,000	\$700,000
Undivided profits.....	204,639	186,724	209,151	198,359
Due depositors on demand.....	4,951,424	4,292,270	4,928,952	3,652,635
Due to trust companies, State, national and private banks and brokers.....	1,157,142	1,125,869	1,631,760	1,104,373
Amount due, not included in either of the above heads.....	2,160	4,085	2,409	3,321
Add for cents.....	1	2	2	2
<b>Total liabilities.....</b>	<b>\$7,015,366</b>	<b>\$6,308,950</b>	<b>\$7,472,274</b>	<b>\$5,658,690</b>

# Evolution of Deposits: NY State Banks

- ▶ Larger rise in deposits for country banks after Specie Resumption in 1879
- ▶ Trend patterns largely in line with Jaremski and Rousseau (2015)
- ▶ Deposits already growing in NYC banks prior to election in 1896

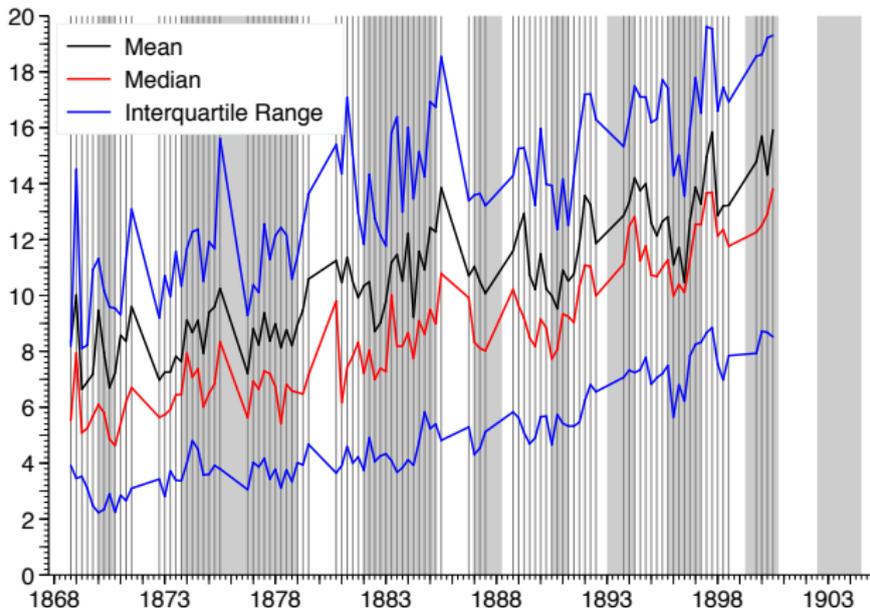


Source: New York State Superintendent of Banks; Authors' Calculation.



# Elements of Systemic Risk: (1) Interbank Balances $\oplus$

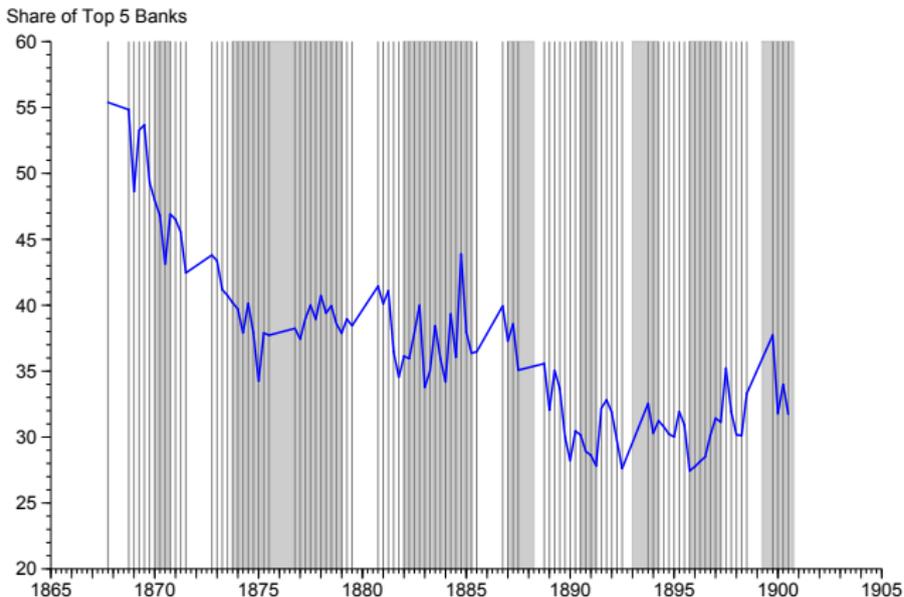
- ▶ Share of liabilities due to other banks more than doubles.
- ▶ Steady increase in the interconnectedness of NY state banks.





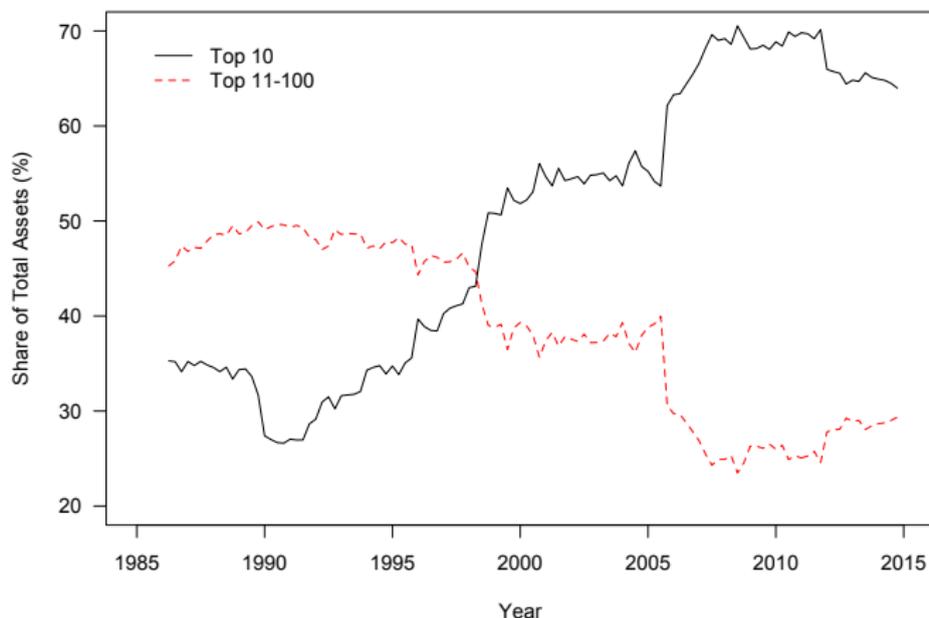
## Elements of Systemic Risk: (2) Asset Concentration ☹

- ▶ Two large drops in banking asset concentration
- ▶ The Specie Act seems to have little effect



Source: New York State Superintendent of Banks.

## Elements of Systemic Risk: (2) Asset Concentration (Now)

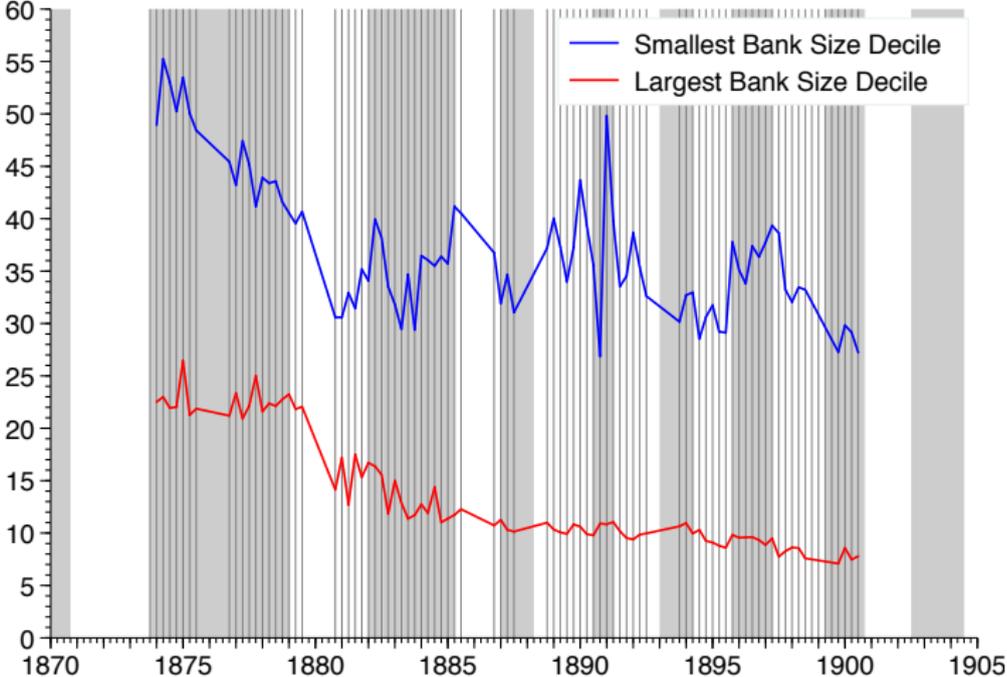


⇒ For power laws in modern banking assets see Fernholz and Koch (2016)



# Elements of Systemic Risk: (3) Capitalization Falls ⊕

## Capital Ratios Decline, Large State Banks at Contemporary Levels



Source: New York State Superintendent of Banks; Authors' Calculation.









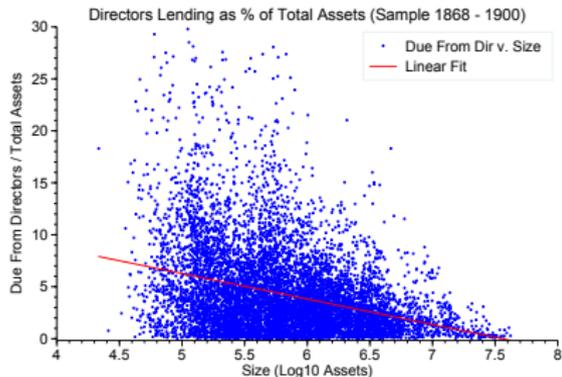






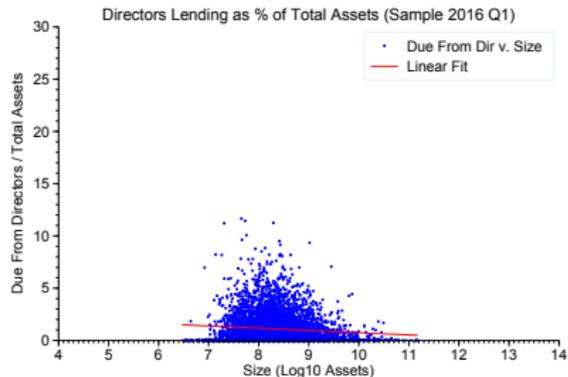
# Loans to Directors – Then and Now

## (1) Historical State Bank Sample



Source: Superintendent of the Banking Department of New York State; Authors' calculations.

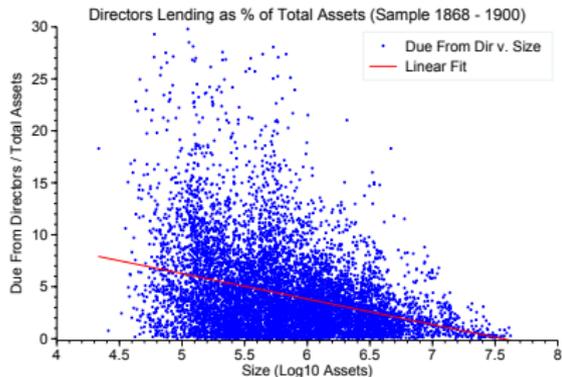
## (2) Last Quarter (2016 Q1) all US Banks



Source: FFIEC Q31; Authors' calculations.

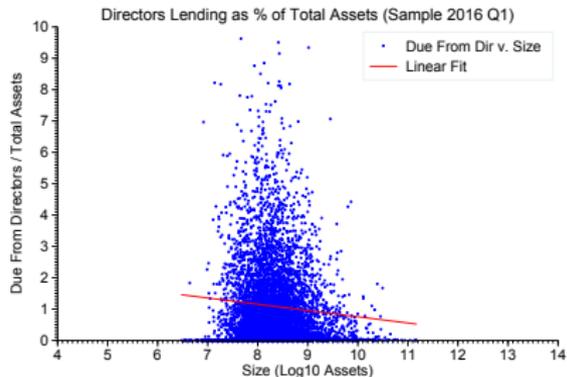
# Loans to Directors – Then and Now

## (1) Historical State Bank Sample



Source: Superintendent of the Banking Department of New York State; Authors' calculations.

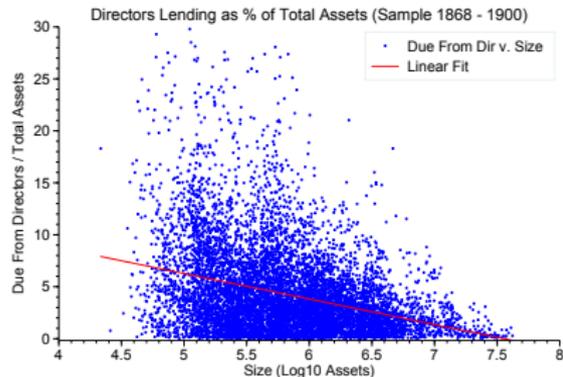
## (2) Last Quarter (2016 Q1) all US Banks



Source: FFIEC Q31; Authors' calculations.

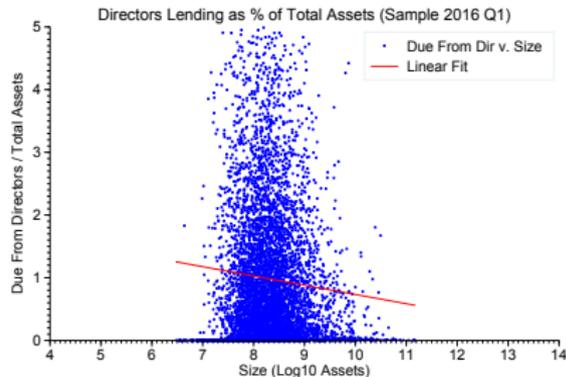
# Loans to Directors – Then and Now

## (1) Historical State Bank Sample



Source: Superintendent of the Banking Department of New York State; Authors' calculations.

## (2) Last Quarter (2016 Q1) all US Banks

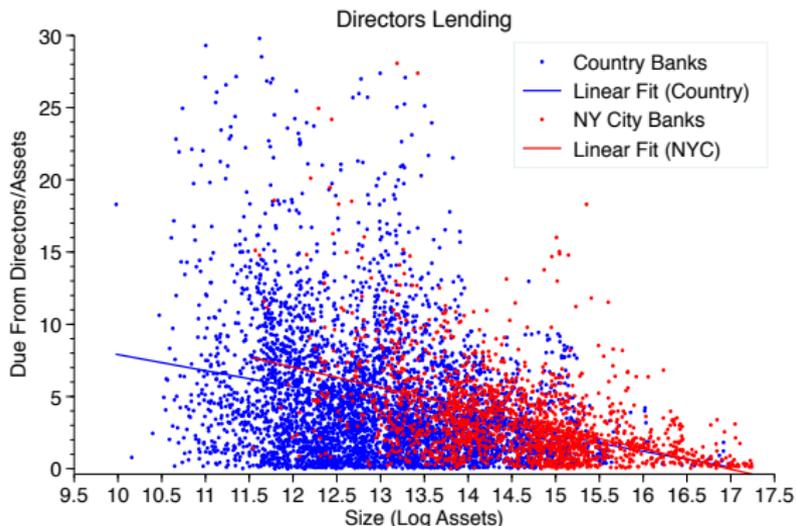


Source: FFIEC 031; Authors' calculations.

# Loans Due from Directors in the National Banking Era

## New York state banks lent a lot to their own directors

- ▶ Banks in **New York City** typically lent more to their directors than banks of their same size in **other areas of the state**.
- ▶ The ratio declines as bank size increases.
- ▶ Comparable ratios to national banks in early 1890s (Calomiris & Carlson, 2016)





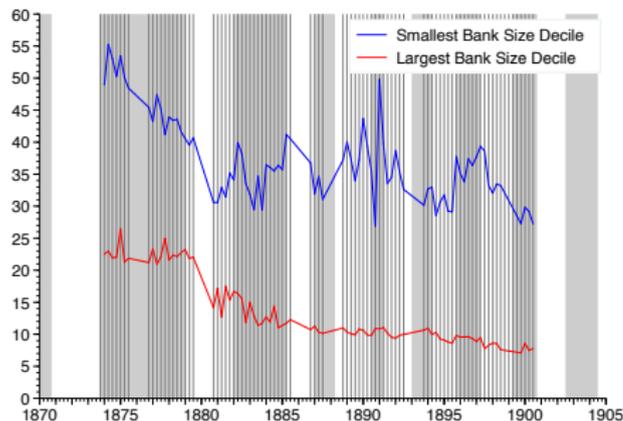




# Constrasting Cyclical Patterns in 1884 Episode

- ▶ Contrast behavior of small versus large banks
- ▶ Substantial loan repayment by small bank directors
- ▶ “Off-balance sheet liquidity” injected during the crisis?

(a) Gross Capital Ratio

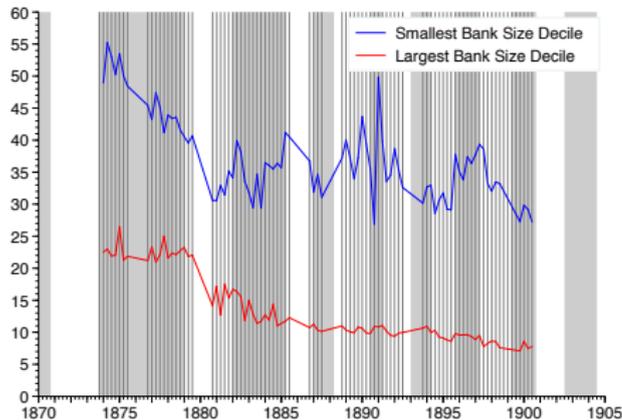


Source: New York State Superintendent of Banks; Authors' Calculation.

# Constrasting Cyclical Patterns in 1884 Episode

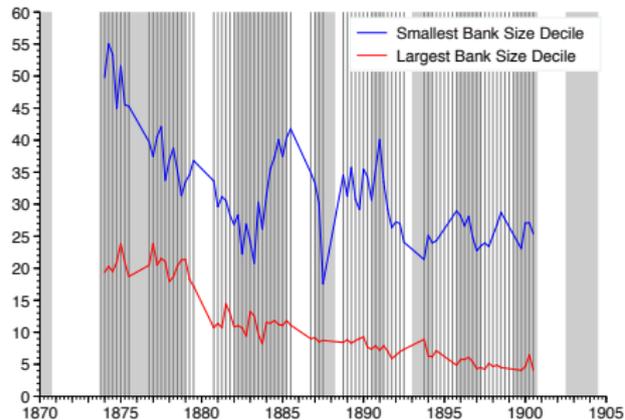
- ▶ Contrast behavior of small versus large banks
- ▶ Substantial loan repayment by small bank directors
- ▶ “Off-balance sheet liquidity” injected during the crisis?

(a) **Gross Capital Ratio**



Source: New York State Superintendent of Banks; Authors' Calculation.

(b) **Net Capital Ratio**



Source: New York State Superintendent of Banks; Authors' Calculation.

# Basel III: Liquidity Coverage Ratio/HQLA

22. The LCR has two components:
- (a) Value of the stock of HQLA in stressed conditions; and
  - (b) Total net cash outflows, calculated according to the scenario parameters outlined below.
- 

$$\frac{\text{Stock of HQLA}}{\text{Total net cash outflows over the next 30 calendar days}} \geq 100\%$$

## A. Stock of HQLA

23. The numerator of the LCR is the “stock of HQLA”. Under the standard, banks must hold a stock of *unencumbered* HQLA to cover the total net cash outflows (as defined below) over a 30-day period under the prescribed stress scenario. In order to qualify as “HQLA”, assets should be liquid in markets during a time of stress and, ideally, be central bank eligible. The following sets out the characteristics that such assets should generally possess and the operational requirements that they should satisfy.<sup>6</sup>







