Bank Examiners' Information and Expertise and their Role in Monitoring and Disciplining Banks before and during the Panic of 1893

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Motivation

The US is famous for its banking sector fragility

However, despite several serious panics, the suspension rate of banks with national charters in the National Banking Era (1864-1913) was pretty low

- Suspension rate 1892-1913
  - Average: 0.39%
  - Maximum 1.9%
- Suspension rate 1984-2010 (all banks)
  - Average: 0.59%
  - Maximum: 2.1%

Variety of potential (non-exclusive) reasons

- Corporate governance – a different paper
- Regulation – different (noted below)
- Examination process – subject of this paper

Overview of inquiry

1. Were the examiners' expert judgements important for assessing the condition of the banks?
   - Need to distinguish between three types of information:
     - Quantitative information observable to everyone
     - Quantitative information observable only by the examiner (but require no expertise to collect)
     - Soft information that requires expertise to interpret
   - Separate these by decomposing the overall judgmental assessment of condition
   - Test whether these component pieces of information are informative about the future condition of the bank
2. Were the examiner assessments used to discipline the bank and did that affect outcomes?
   - Impact on bank behavior
   - Evidence of market discipline

National Banking Era

The National Banking Era (1863-1913)

Banks are chartered by the national government and by state governments

- We use national banks - rules and regulations uniform

Regulations different from today

- National banks are unit banks
- No deposit insurance and no central bank
- Capital requirements expressed as a dollar amount. Equity holders subject to "double liability"
- Cash requirements, though generally not particularly binding

Monitoring process

- Five times a year submit "call reports" detailing their balance sheets. Published in local newspapers
- National banks are examined once or twice a year.

Sample of banks

There are about 3500 nationally chartered banks in 1890

- Gathering data on all these institutions is (so far) prohibitive

We use all National banks in 37 cities

- Mostly larger cities located in the West or South
  - Kansas City, MO; Louisville, KY; New Orleans, LA; Los Angeles, CA;
- 205 total banks
- Mid-tier banks (stand between large NY city banks and the small-town banks)
- 22 failed in the panic and 36 suspended temporarily

Mid-size banks

- Assets of $164 thousand to $8.3 million
- (Largest banks at the time had ~$35 million in assets)

Data sources

Primary data source is the National bank examination reports

Use the exam closest to, but not after, May 1, 1893.

Also use balance sheet data from the September 1892 “Call Report” - report most closely preceding the 1893 panic

Examination process

Exams typically took one or two days

Examiners arrive semi-randomly with some spatial sequencing

- Minimal evidence of window dressing following examiner arrival

Covered many aspects of the bank's operations

- Ownership structure, corporate governance practices
- Details on asset composition and quality

Some measures are quantitative:

- Share of loans legally "past due"
- Was there an active discount committee that reviewed the loans

Some measures are "soft":

- Was the management "prudent and of good character"?
- Assessment of the "general character of the loans" including whether any were bad but not legally past due

Estimate of probable loss

A key piece of information that the examiners reported was "total probable losses"

- A summary statistics of the condition of the bank
- Includes estimates on loan losses, securities losses, as well as write-downs on the banking house and furniture
- This number was compared to the income and net worth of the bank to determine whether the bank should be disciplined

In coming up with this number, which is itself a judgment, the examiner could use:

- Publically observable information (from the call report)
- Privately observable quantitative information
- Privately observable soft information

Determining the value of information sets through the lens of expected losses

Decomposition approach

1. $\frac{Loss}{Assets} = \alpha_1 + \beta_1 * Pub\ Quant + \varepsilon_1$

2. $\varepsilon_1 = \alpha_2 + \beta_2 * Priv\ Quant + \varepsilon_2$

3. $Outcome = \alpha_3 + \gamma_1 * \varepsilon_2 + \gamma_2 * \left(\hat{\alpha}_2 + \hat{\beta}_2 * Priv\ Quant\right) + \gamma_3 * \left(\hat{\alpha}_1 + \hat{\beta}_1 * Pub\ Quant\right) + error$

Alternative approach

1. $Outcome = \alpha_3 + \delta_1 * \varepsilon_2 + \delta_2 * (Priv\ Quant) + \delta_3 * (Pub\ Quant) + error$

Fitting approaches together

The two procedures approach the value of subjective vs. quantitative information differently

"Decomposition"

- Uses only examiner knowledge
- Focuses on how outcomes are related to risks seen by the examiner

"Alternative"

- Allows econometrician to assess value of pieces of information ex post
- Looks at the value of soft information against a holistic picture of the bank

Decomposition: Step 1 regression

Dependent variable: total losses/assets	Coefficient	Standard Error
Log assets $_{CR\ 1892}$	0.14	(0.40)
Net worth to assets $_{CR\ 1892}$	0.05*	(0.03)
Cash to assets $_{CR\ 1892}$	-0.07	(0.08)
Due from banks to assets $_{CR\ 1892}$	0.03	(0.04)
OREO to assets $_{CR\ 1892}$	1.1***	(0.15)
Indiv. dep. to assets $_{CR\ 1892}$	-0.02	(0.02)
Uses bills of rediscount $_{CR\ 1892}$	0.28	(0.65)
Log age of bank $_{1892}$	0.01	(0.38)
Located in a reserve city $_{1892}$	-2.05***	(0.72)
Log county population $_{1890}$	1.1**	(0.49)
Log distance to New York City	0.69	(0.72)
State has lots of mining $_{1892}$	-1.7**	(0.70)
Share state income from agriculture$_{1890}$	2.6*	(1.50)
Constant	-12.1	(7.7)
Observations	205	
Adjusted R^2	.36	

Decomposition: Step 2 regression

Dependent variable: Step 1 residuals	Coefficient	Standard Error
Borrow from banks through CDs $_{ER}$	1.3*	(0.80)
Checking to individual deposits $_{ER}$	-0.01	(0.01)
Real estate loans to total loans $_{ER}$	0.10*	(0.06)
Demand loans to loans $_{ER}$	-0.02	(0.01)
Legally bad loans to loans $_{ER}$	-0.08	(0.08)
Mgmt ownership $_{ER}$	-0.003	(0.01)
Frequency of board meetings $_{ER}$	0.46*	(0.28)
Active discount committee $_{ER}$	-1.1**	(0.44)
President bonded $_{ER}$	-0.79***	(0.31)
Constant	0.13	(1.0)
Observations	205	
Adjusted R^2	.11	

Decomposition: Effect on outcome variables

	Did the bank close in 1893? (probit)		Percent change in retained earnings		Change in ratio of other real estate owned to assets	
	Coef.	SE	Coef.	SE	Coef.	SE
Private soft information	0.14*	(0.08)	-10.2***	(2.8)	0.35*	(0.20)
Private quantitative information	0.12	(0.14)	-15.8***	(4.0)	0.49*	(0.30)
Public information	0.20*	(0.11)	-12.0***	(4.4)	0.03	(0.23)
Constant	-0.82***	(0.12)	-4.4	(4.1)	0.98***	(0.18)
Observations	205		171		171	
Adjusted/pseudo R^2	.07		.12		.07	

Ex post approach Dependent variable: Closure (probit, marginal effects)		Coefficient	Standard Error
Asset risk measures	Private soft information	0.26**	(0.16)
	Loans on real estate to total loans $_{ER}$	-0.05	(0.06)
	OREO to assets $_{CR\ 1892}$	0.44*	(0.27)
	Legally bad loans to total loans $_{ER}$	0.01	(0.08)
	Cash to assets $_{CR\ 1892}$	-0.05	(0.06)
	Frequency of Board meetings $_{ER}$	-0.04	(0.20)
	Has an active discount committee $_{ER}$	-0.07	(0.45)
	President posts a performance bond $_{ER}$	0.47	(0.42)
Liabilities	Uses bills and rediscounts $_{CR\ 1892}$	0.63	(0.67)
	Borrow from banks through CDs $_{ER}$	0.86	(0.65)
	Individual deposits to assets $_{CR\ 1892}$	-0.04*	(0.02)
	Checking deposits to individual deposits $_{ER}$	-0.02	(0.02)
Capital	Net worth to assets $_{CR\ 1892}$	-0.04*	(0.02)
	Share of equity owned by management $_{ER}$	-0.01	(0.01)
	Log assets $_{CR\ 1892}$	-0.45*	(0.26)
	(also all other variables listed in previous tables)		
	Pseudo R^2	.34	

Ex post approach Dependent variable: %Δ retained earnings		Coefficient	Standard Error
Asset risk measures	Private soft information	-8.0***	(2.9)
	Loans on real estate to total loans $_{ER}$	-27.9**	(14.2)
	OREO to assets $_{CR\ 1892}$	-8.7**	(4.3)
	Legally bad loans to total loans $_{ER}$	0.14	(1.5)
	Cash to assets $_{CR\ 1892}$	0.07	(1.2)
	Frequency of Board meetings $_{ER}$	1.3	(6.9)
	Has an active discount committee $_{ER}$	8.6	(7.7)
	President posts a performance bond $_{ER}$	2.8	(7.6)
Liabilities	Uses bills and rediscounts $_{CR\ 1892}$	-28.0**	(10.6)
	Borrow from banks through CDs $_{ER}$	-27.9**	(14.3)
	Individual deposits to assets $_{CR\ 1892}$	0.81**	(0.32)
	Checking deposits to individual deposits $_{ER}$	0.34*	(0.18)
Capital	Net worth to assets $_{CR\ 1892}$	0.12	(0.44)
	Share of equity owned by management $_{ER}$	0.17	(0.20)
	Log assets $_{CR\ 1892}$	1.4	(6.3)
	(also all other variables listed in previous tables)		
	Adjusted R^2	.18	

Ex post approach Dependent variable: Δ ratio of OREO to assets		Coefficient	Standard Error
Asset risk measures	Private soft information	0.59**	(0.10)
	Loans on real estate to total loans $_{ER}$	0.11	(0.09)
	Above median OREO to assets $_{CR\ 1892}$	.84**	(0.40)
	Legally bad loans to total loans $_{ER}$	-0.18*	(0.11)
	Cash to assets $_{CR\ 1892}$	-0.04	(0.05)
	Frequency of Board meetings $_{ER}$	0.19	(0.25)
	Has an active discount committee $_{ER}$	0.09	(0.44)
	President posts a performance bond $_{ER}$	-0.97**	(0.40)
Liabilities	Uses bills and rediscounts $_{CR\ 1892}$	-0.32	(0.68)
	Borrow from banks through CDs $_{ER}$	0.70	(0.88)
	Individual deposits to assets $_{CR\ 1892}$	-0.001	(0.02)
	Checking deposits to individual deposits $_{ER}$	-0.02*	(0.01)
Capital	Net worth to assets $_{CR\ 1892}$	0.07**	(0.03)
	Share of equity owned by management $_{ER}$	0.003	(0.01)
	Log assets $_{CR\ 1892}$	-0.23	(0.34)
	(also all other variables listed in previous tables)		
	Adjusted R^2	.20	

Examiners and Bank Discipline

- Examiners could make a variety of recommendations:
  - Mild: suggest the bank modernize bookkeeping
  - Severe: bank should charge off the value of bad assets by writing down the value of capital
  - Typical: bank should not pay dividends until bad loans have been reduced and written off.
    - For 38 of 205 banks, the examiner recommends the suspension of dividends

Consider parts of the discipline process

1. Did the banks follow the recommendations?
   - Yes, even after controlling for other indicators of condition we find that an examiner recommendation is associated with an increase in the likelihood that the bank skipped a dividend
2. What did banks do with the funds that they accumulated by skipping the dividend?
   - Charge-offs of losses tended to be higher at banks where the examiner recommended skipping the dividend even after accounting for other measures of asset quality
3. Is there a relation between disciplinary action and borrowing rates? [evidence of market discipline]

Impact on borrowing costs

- The examiners reported the rates at which banks paid on interbank deposits, on CDs issued to the public, bills payable, rediscounts, and interbank CDs
  - Construct a measure of the weighted average cost of funds
  - Also the average cost of funds obtained from bills payable, rediscounts, and interbank CDs
    - Other banks may be the most informed about the condition of their peers
- Test whether banks that had not recently paid dividends paid more for funds even after controlling for information observable on the call report

Dependent variable: interest rate on borrowings	Total cost of funds		Rate on bills payable & redisc.	
	Coeff	SE	Coeff	SE
Bank omitted most recent dividend	0.38**	(0.16)	0.62*	(0.36)
Log assets $_{CR\ 1891}$	0.16	(0.11)	.45*	(0.26)
Cash to assets $_{CR\ 1891}$	-0.07***	(0.02)	-0.05	(0.05)
Other real estate owned to assets $_{CR\ 1891}$	-0.02	(0.05)	0.09	(0.10)
Log age	0.18	(0.12)	-0.42	(0.27)
Located in a reserve city	0.39**	(0.20)	0.08	(0.49)
Log county population	-0.40***	(0.14)	-0.44	(0.31)
Log distance to NYC	1.0***	(0.24)	1.2**	(0.54)
State has lots of mining	-0.58***	(0.20)	-0.80*	(0.49)
Share state income from agriculture	-0.36	(0.44)	0.16	(1.1)
Crop moving season	0.31**	(0.14)	-.38	(0.32)
Constant	-5.7**	(2.2)	-6.0	(5.4)
Observations	257		68	
Adjusted R^2	.33		.31	

Conclusion

Find that the information collected as part of the examination process was useful in forecasting future bank condition

- Both quantitative information and soft information used
- Latter finding suggests examiner expertise was valuable

Find evidence that the examiners were able to use their information to push for improvements in bank health

Did the bank pay a dividend in the past six months? [Probit regression]		Coeff	SE
Asset risk measures	Examiner recommended no dividend	-0.21**	(0.10)
	Loans on real estate to total loans $_{ER}$	0.002	(0.01)
	OREO to assets $_{CR\ 1892}$	-0.05	(0.01)
	Legally bad loans to total loans $_{ER}$	0.01	(0.01)
	Cash to assets $_{CR\ 1892}$	0.02	(0.01)
	Frequency of Board meetings $_{ER}$	-0.02	(0.05)
	Has an active discount committee $_{ER}$	0.15**	(0.08)
	President posts a performance bond $_{ER}$	-0.20	(0.08)
Liabilities	Uses bills and rediscounts $_{CR\ 1892}$	-0.10	(0.11)
	Borrow from banks through CDs $_{ER}$	-0.13	(0.13)
	Individual deposits to assets $_{CR\ 1892}$	-0.004	(0.004)
	Checking deposits to individual deposits $_{ER}$	0.003	(0.002)
Capital	Net worth to assets $_{CR\ 1892}$	-0.006	(0.005)
	Share of equity owned by management $_{ER}$	-0.0002	(0.002)
	Log assets $_{CR\ 1892}$	0.12*	(0.07)
	(also all other variables listed in previous tables)		
	Pseudo R^2	.07	

Ratio of charge offs to assets [Tobit regression]		Coeff	SE
Asset risk measures	Examiner recommended no dividend	0.79**	(0.32)
	Loans on real estate to total loans $_{ER}$	0.003	(0.03)
	OREO to assets $_{CR\ 1892}$	0.05	(0.14)
	Legally bad loans to total loans $_{ER}$	-0.02	(0.04)
	Cash to assets $_{CR\ 1892}$	-0.06*	(0.03)
	Frequency of Board meetings $_{ER}$	-0.11	(0.12)
	Has an active discount committee $_{ER}$	-0.49**	(0.23)
	President posts a performance bond $_{ER}$	0.11	(0.22)
Liabilities	Uses bills and rediscounts $_{CR\ 1892}$	0.04	(0.33)
	Borrow from banks through CDs $_{ER}$	-0.24	(0.38)
	Individual deposits to assets $_{CR\ 1892}$	0.01	(0.01)
	Checking deposits to individual deposits $_{ER}$	-0.001	(0.01)
Capital	Net worth to assets $_{CR\ 1892}$	0.01	(0.02)
	Share of equity owned by management $_{ER}$	0.002	(0.005)
	Log assets $_{CR\ 1892}$	0.22	(0.21)
	(also all other variables listed in previous tables)		
	Pseudo R^2	.07	