

The Impact of Supervision on Bank Performance

FEDERAL RESERVE BANK *of* NEW YORK

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What is the impact of supervision?

- Prudential supervision:
 - Ensures compliance with regulations (i.e. exams)
 - Monitors for unsafe and unsound practices, thereby encouraging improved governance and risk management
- Complementary to a regulatory regime (rules), but also distinct

This paper seeks to estimate the distinct impact of additional supervision on bank outcomes



How to overcome endogeneity?

- Supervisors focus on large, complex, or risky institutions
 - Naïve inference might conclude supervision generates large, complex, risky banks
- Empirical strategy:
 - Bank Holding Companies are supervised by Reserve Banks according to where the BHC is headquartered
 - **Hypothesis: Ceteris paribus, the largest institutions in a FR District receive more supervisory attention**
 - We confirm using hours reported by supervisors that are directly attributable to a particular bank
 - We compare outcomes of banks that differ in their size rank
 - Because bank failures are infrequent, we focus on measures of risk and performance

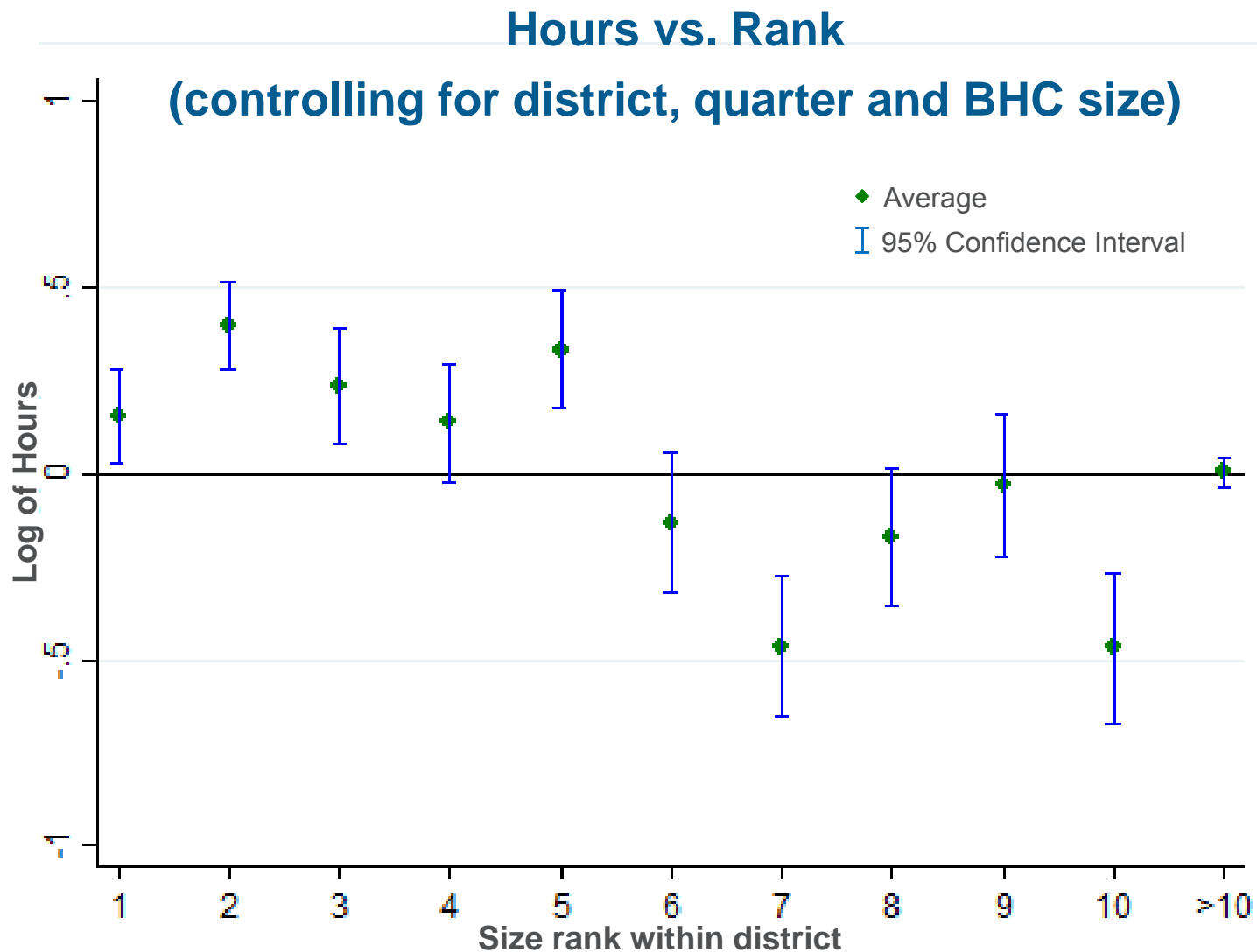


How to measure supervisory attention?

- Data on Federal Reserve supervisor hours
- Quarterly panel, aggregated to the parent BHC
 - Sample period: 2006Q1 – 2014Q4
 - Hours are reported for ~60% of BHCs and ~96% of assets
 - Linked with consolidated financials from Y-9Cs (BHC filings)
- Potential issues:
 - Reporting standards can vary across districts
 - Particular subsidiaries may demand more/less attention
- We validate our proxy for attention in the hours sample, but implement it on a longer sample (1991-2014)



Top ranked receive more supervisory hours...



Note: Log(hours) on the y-axis are the residuals from a regression of log of supervisory hours on district-time fixed effects and the log of assets. Size rank is determined by book asset size within a district-quarter. Points reflect the average residual for a rank and brackets designate the 95% confidence interval.



... even after considering various controls

VARIABLES	(1)	(2)	(3)	(4)
Top Five	0.632** (0.246)	0.539*** (0.180)	0.537*** (0.180)	0.537*** (0.181)
log(Assets)	1.761** (0.792)	1.210* (0.704)	1.186* (0.701)	1.072 (0.726)
log(Assets) Squared	-0.023 (0.024)	-0.013 (0.023)	-0.012 (0.023)	-0.009 (0.024)
log(Entities)		0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Public Indicator				0.074 (0.085)
Bank Type Controls		+	+	+
Balance Sheet Controls			+	+
Observations	14,836	14,783	14,783	14,783
District-Quarter FE	Yes	Yes	Yes	Yes
R-squared	0.297	0.522	0.523	0.523

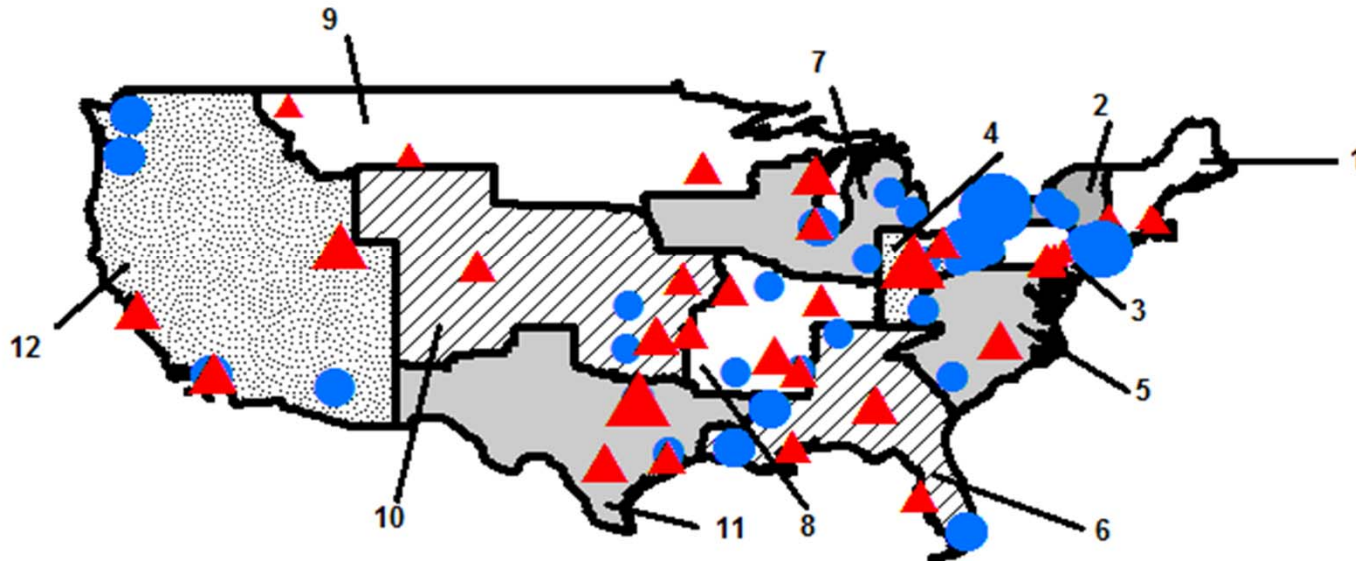
Note: Contains results from regressions of log of supervisory hours on a dummy indicating Top 5 size-rank in a district and controls. Bank Type Controls: Asset share for SMBs >\$10bn, SMBs <\$10bn, and National Banks. Balance Sheet Controls: Loans/Assets, Deposits/Liabilities, and HHI of assets. Each regression includes district-quarter fixed effects. Observations are BHC-quarters from 2006Q1 to 2014Q4. Standard errors are clustered by BHC. *** p<0.01, ** p<0.05, * p<0.1.



Match Top Five to non-Top Five in another district

- Want to compare our treatment (Top Five) to a similar control group
- Propensity score match on size, complexity and business mix to non-top ranked firms in another district

Top Five and matched BHCs by FR District



Note: Illustrates the headquarters location of Top Five banks and their matches in 2014Q1. Shapes are sized based on total assets where the categories are in billions of dollars. Size rank is determined by book asset size within a district-quarter. Numbers indicate Federal Reserve Districts.



Empirical model with district fixed effects

- We ultimately estimate the *within* district difference between a BHC and its matches depending on treatment status
- Panel regression of outcomes on scrutiny proxy:

$$Y_{ijt} = \beta TopFive_{ijt} + \mathbf{\Pi}_{it} + \alpha_{jt} + \epsilon_{ijt}$$

- Y_{ijt} is the outcome measure at time t , for BHC i
- $TopFive_{ijt}$ is an indicator for treatment
- $\mathbf{\Pi}_{it}$ is a vector of district-quarter fixed-effects
- j indexes the treated firms and indicates to which treatment BHC it is matched (for treatment BHCs $i = j$)
- α_{jt} is a fixed effect for a treatment observation and its matches



Results: Risk/Return accounting measures

Dependent Variable (Y)	Top Five (β)
Balance Sheet	
% of RWA/Assets	-1.790
Tier 1 Ratio	0.276
% of NPL	-0.248**
SD of NPL/Loans	-0.096***
% Loan Loss Reserves (LLR)	-0.059
SD of LLR/Loans	-0.031**
% Asset Growth	-1.038
Earnings	
ROA	0.018
SD of ROA	-0.178***
Sharpe Ratio of ROA	1.451**
Log Z-Score	0.269***

- Lower levels and volatility of non-performing loans
- Lower volatility of loan loss reserves
- Similar provisioning
- More conservative

- The same ROA,
- But less volatile
- Better return per unit 'risk'
- Greater distance to default

Note: Regresses dependent variable on a Top Five indicator, a dummy indicating the matching group, and district-quarter fixed effects. Sample is top ten BHCs and their matches. SD of accounting based measures based on 8Qs forward. The Z-score is accounting based measure of distance to default. Excess return based on Fama-French 3 Factor model. Standard errors are clustered by BHC. *** p<0.01, ** p<0.05, * p<0.1.



Results: Risk/Return market measures

Dependent Variable (Y)	Top Five (β)
Market	
Market Cap/Equity	0.063
Quarterly Excess Return %	-0.90**
SD of Daily Return	-0.001**
Sharpe Ratio	-0.004
Bottom Decile of Returns	0.008
Skew of Daily Return	-0.035

- Lower returns
- Lower volatility
- But similar Sharpe Ratio
- Lower returns commensurate with lower risk

Note: Regresses dependent variable on a Top Five indicator, a dummy indicating the matching group, and district-quarter fixed effects. Sample is top ten BHCs and their matches. SD of accounting based measures based on 8Qs forward. The Z-score is accounting based measure of distance to default. Excess return based on Fama-French 3 Factor model. Standard errors are clustered by BHC. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.



Results: Governance/Supervisory tools

Dependent Variable (<i>Y</i>)	Top Five (β)
Governance	
Risk Committee Dummy	-0.020
Risk Manager Dummy	-0.027
Supervisory Tools	
Total MRA/MRIAs	-3.112
New MRA/MRIAs	-0.532
Closed MRA/MRIAs	0.290
Enforcement Actions	0.150*
Rating	-0.058
Ratings Change Dummy	-0.000

- No meaningful differences in presence of Risk Committee or CRO
- Fewer MRA/MRIAs
- But more enforcement actions
- Minor differences in ratings
- No strong relation with riskiness perceived by supervisors

Note: Regresses dependent variable on a Top Five indicator, a dummy indicating the matching group, and district-quarter fixed effects. Sample is top ten BHCs and their matches. Governance measures from proxy statements. Matters Requiring Attention only available from 2006. Enforcement actions and ratings from 1991-2014. Standard errors are clustered by BHC. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.



What contributes to lower volatility?

- Top Five firms have lower volatility of both:
 - Revenues
 - Net interest margin
 - Non-interest Income
 - Expenses
 - Loan loss provisions
 - Non-interest expense (excl. compensation and fixed assets)
- Less ‘discretionary’ provisioning behavior

Note: Regresses dependent variable on a Top Five indicator, a dummy indicating the matching group, and district-quarter fixed effects. Sample is top ten BHCs and their matches. SD of accounting based measures based on 8Qs forward. Noninterest expense excludes compensation and fixed assets. Discretionary accounting choices calculated as residuals from predictive regression on the full panel of BHCs (e.g. Moyer 1990). The coefficient on Top Five can be interpreted as the differential impact of Top Five status. Standard errors are clustered by BHC. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.



Takeaways

- Results suggest that greater supervisory attention:
 - Lowers the volatility of accounting measures
 - Partly as a result of greater conservatism and less discretion
 - Suggestive evidence that market measures are less volatile with a commensurate trade-off in returns
- Caveats:
 - Does not speak to the efficiency of supervision
 - Open question of how supervision accomplishes these tasks