

Comments by Rafael Repullo on

**Weighted Noise:
Discretion in Regulation**

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Introduction

- Banking supervision combines hard with soft information
 - Hard coming from (objective) accounting statements
 - Soft coming from (subjective) supervisory assessments
- Outcome is summarized in a “rating” of the bank
 - In US CAMELS’ a number between 1 (best) and 5 (worst)
- Characteristics of bank supervisors (examiners) in US
 - Are rotated periodically among banks
 - Exercise wide discretion

Research questions

- How can we measure examiner discretion?
- Does examiner discretion matter for bank behavior?
 - Ex-post: in subsequent decisions on capital and lending
 - Ex-ante: in prior decisions on capital and lending
- Does examiner discretion predict deterioration of performance?
 - In terms of non-performing or delinquency ratios

Institutional setting (i)

- US banks must undergo on-site examinations on regular cycle
 - Typically every 12 months
- Except for largest banks, state and federal agencies are involved
 - Banks are rotated across examiners within an agency
 - Banks are rotated across agencies in alternate years
 - Concurrent exams (by both agencies) can happen,
in which case they issue separate reports
 - Disagreement across agencies can then be observed

Institutional setting (ii)

- Outcome of examinations is a CAMELS rating from 1 to 5
 - **C**apital adequacy
 - **A**sset quality
 - **M**anagement
 - **E**arnings
 - **L**iquidity
 - **S**ensitivity to market risk
- Ratings for each of the six components and the composite rating

Data (i)

- National Information Center of the Federal Reserve
 - Sample period: 1998-2020
 - Bank identity, lead examiner identity, exam date
 - CAMELS rating (together with its components)
- Reports on Condition and Income: Call Reports
 - Capital and leverage ratios
 - Return on assets
 - Non-performing and delinquency ratios

Data (ii)

- Final (cleaned) sample contains
 - 2,407 lead examiners and 14,679 examinations
 - Average of six exams per lead examiner
- Distribution of ratings
 - Rating 1: 27%
 - Rating 2: 60%
 - Rating 3: 10%
 - Ratings 4 and 5: 3%

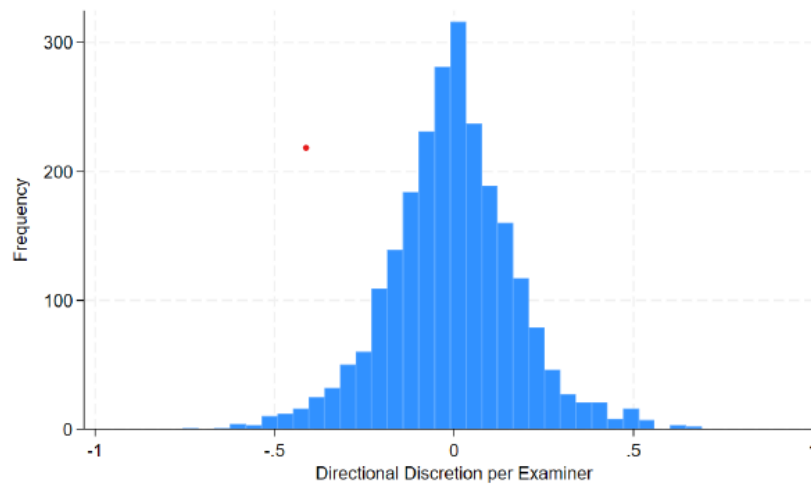
Main results (i)

How can we measure examiner discretion?

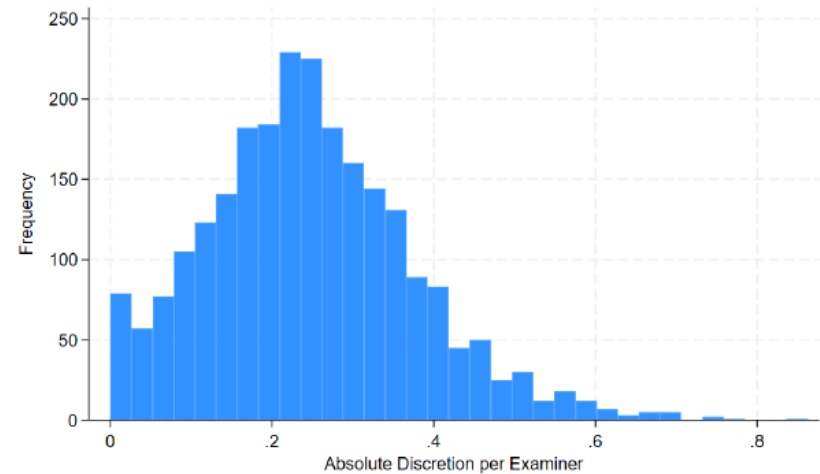
- Define
 - R_{ijt} is rating by examiner i of bank j at date t
 - $\hat{R}_{ijt}$ is prediction of R_{ijt} using observable characteristics X_{jt-1}
 - $Directional_Discretion_{ijt} = DD_{ijt} = R_{ijt} - \hat{R}_{ijt}$
 - $Absolute_Discretion_{ijt} = AD_{ijt} = |DD_{ijt}|$
- These measures can be aggregated at examiner level

Main results (ii)

- Distribution of examiner discretion



DD_i



AD_i

→ Examiner discretion has large variance

Main results (iii)

Does examiner discretion matter for ex-post bank behavior?

- Examiner directional discretion leads (after 4 quarters) to
 - Higher Tier 1 capital ratio
 - Lower loan growth

Main results (iv)

Does examiner discretion matter for ex-ante bank behavior?

- Need a proxy of examiner uncertainty (at the state level)
 - Average of absolute discretion over last 5 years
 - SD of directional discretion over last 5 years
- Both proxies lead to
 - Higher Tier 1 capital ratio
 - Lower loan growth

Main results (v)

Does examiner discretion predict future performance?

- Exam directional discretion leads to
 - Higher ratings (bad)
 - Higher non-performing loan ratios
 - Higher delinquency ratios

Other results (i)

- Examiner rotation is random
 - Examiner leave-out-mean ratings uncorrelated with observable measures of bank quality
- Regressing the composite rating on its six component ratings
 - Highest weight is in the Management rating
 - Examiners with higher absolute discretion place greater weight in the Management rating
 - The most subjective component

Other results (ii)

- For smaller sample of concurrent (state and federal) ratings
 - Disagreement is common (28% of cases)
 - Especially in the Management rating (31%)

Structure of paper

- Introduction
- Institutional background
- Conceptual framework
- Results
- Conclusion

This discussion

- Two parts
 - Review of conceptual framework
 - Comments on the empirical results

Part 1

Conceptual framework

Comments on conceptual framework (i)

- Goal: “Distinguish between informative variation arising from soft information and unproductive variation arising from noise”
- Claim: This is not possible, since soft information is noisy signal of safety and soundness

Comments on conceptual framework (ii)

- Reference to an “unobserved optimal rating decision”
 - What do you mean by optimal?
- Examiner rating as a random deviation from this decision
 - How is soft information incorporated into this framework?

An alternative framework (i)

- Let us define (omitting subindexes for simplicity)

Z = Underlying state of the bank (a latent variable)

X = Hard information on the state of the bank

S = Soft information on the state of the bank

- Let us assume (after suitable normalization)

$$\begin{bmatrix} Z \\ X \\ S \end{bmatrix} \sim N \left(\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \rho_{ZX} & \rho_{ZS} \\ \rho_{ZX} & 1 & \rho_{XS} \\ \rho_{ZS} & \rho_{XS} & 1 \end{bmatrix} \right)$$

An alternative framework (ii)

- Let us define

→ Bank rating

$$R = E[Z|X, S]$$

→ Prediction of bank rating

$$\hat{R} = E[R|X]$$

→ By the properties of normal distributions

$$R = \alpha X + \beta S$$

$$\hat{R} = E[\alpha X + \beta S|X] = \alpha X + \beta E[S|X] = \alpha X + \beta \rho_{XS} X$$

An alternative framework (iii)

- We can now define

$$\textit{Directional_Discretion} = DD = R - \hat{R} = \beta(S - \rho_{XS}X)$$

$$\textit{Absolute_Discretion} = AD = |DD| = |\beta(S - \rho_{XS}X)|$$

- Note that we have

$$E[DD] = 0$$

→ As shown in previous figure

An alternative framework (iv)

- Framework can incorporate examiners' biases
 - As those noted in Agarwal et al. (2014)
 - Federal examiners are tougher than state examiners

- Define bank rating as

$$R = E[Z|X, S] + B$$

→ where $B \in \{B_L, B_H\}$ is the examiner's bias (with $B_L < B_H$)

- If $\rho_{XB} = 0$, then one can show that

$$E[DD_L] < E[DD_H]$$

Summing up

- Alternative setup provides a simpler (and better) framework for understanding the empirical results in the paper

Part 2

Comments on empirical results

Comment 1

- CAMELS ratings are discrete (1–5)
 - Determinants of $1 \rightarrow 2$ different from those of $2 \rightarrow 3$
 - Determinants of $2 \rightarrow 3$ different from those of $3 \rightarrow 2$
 - Better use discrete choice models

Comment 2

- Data on *Directional_Discretion* could be exploited more
 - Correlation with observables (beyond State vs Federal)
 - Federal Reserve, FDIC, OCC
 - Date and state dummies
 - Macroeconomic variables

Comment 3

- Claim that greater *Absolute_Discretion* only adds noise
 - without improving forecast accuracy
- Claim should be toned down
 - difference in regression coefficients marginally significant
- Also note that noise encourages prudent bank behavior
 - Higher capital and lower loan growth
 - See Repullo (2025) for a theoretical model

Concluding remarks

Concluding remarks (i)

- Paper addresses novel issue with an amazing database
 - Many interesting results
 - More work can be done along these lines
- Intermediate goal for policy
 - Improve design of supervision
- Final goal for policy
 - Conduct welfare analysis of bank supervision

Concluding remarks (ii)

- Minor suggestion for the title of the paper

→ Replace

“Discretion in Regulation”

→ by

“Discretion in Bank Supervision”

- Major suggestion for the ECB

→ Start exploiting SSM data on bank supervision

→ Effect of the composition of the Joint Supervisory Teams