

Sentiment in Bank Examination Reports and Bank Outcomes

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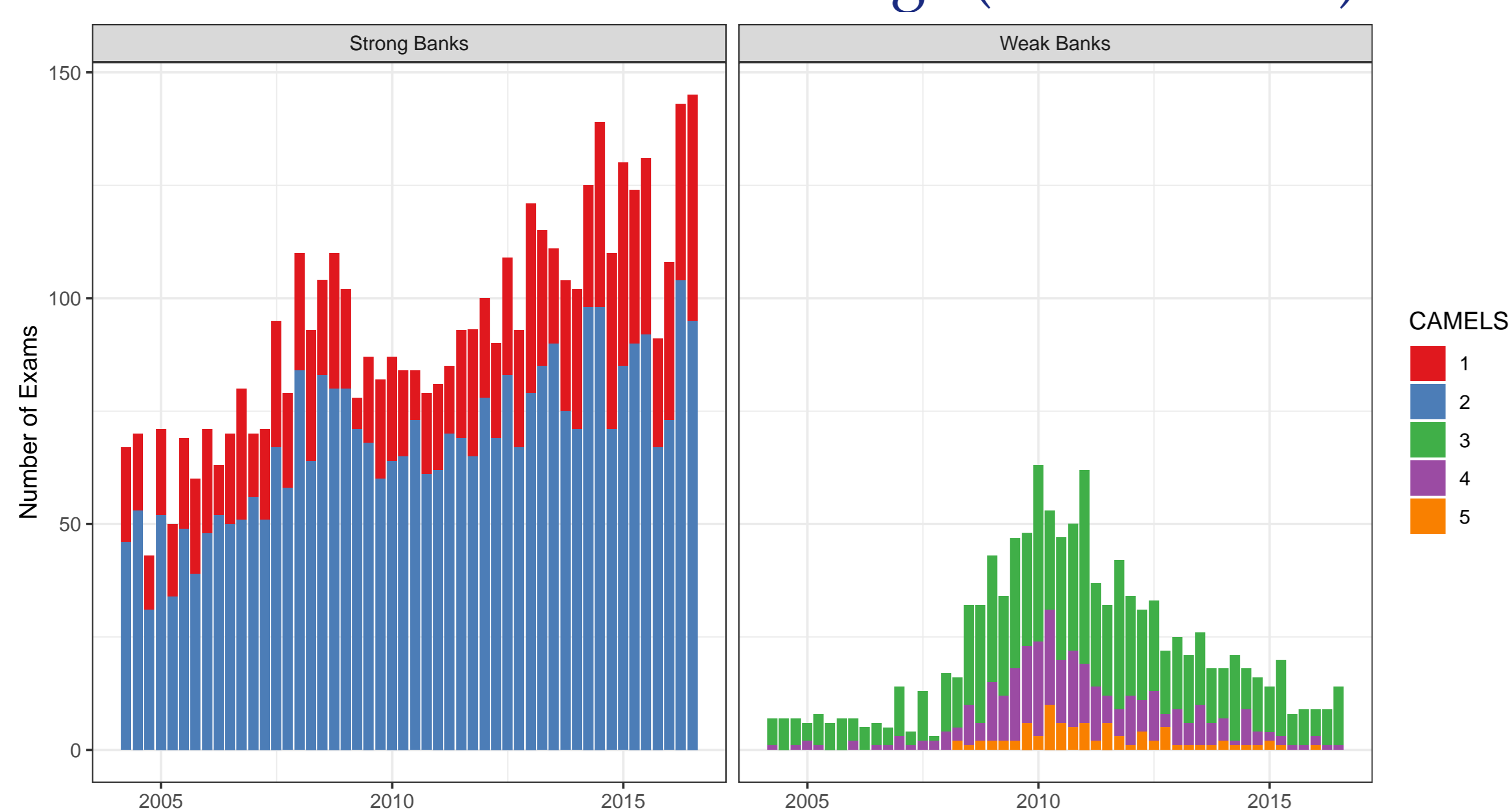
Abstract

We investigate whether the bank supervisory process provides useful insight into bank future outcomes. We do this by conducting textual analysis on about 5,400 small to medium-sized commercial bank examination reports from 2004 to 2016. These confidential examination reports provide textual context to each component of the supervisory CAMELS ratings: capital adequacy, asset quality, management, earnings, liquidity, and sensitivity to market risk. Each component is given a categorical rating, and each bank is then designated an overall composite CAMELS rating along the same scale, which are used to determine the safety and soundness of banks. We find that controlling for a variety of factors, including the ratings themselves, the sentiment supervisors express in describing most of the components predict future bank outcomes. The sentiment conveyed in the capital, asset quality, management, and earnings sections provides significant information in predicting future outcomes for capital levels, problem loans, supervisory actions, and profitability, respectively. This suggests bank supervisors play a meaningful role in the surveillance of the banking system.

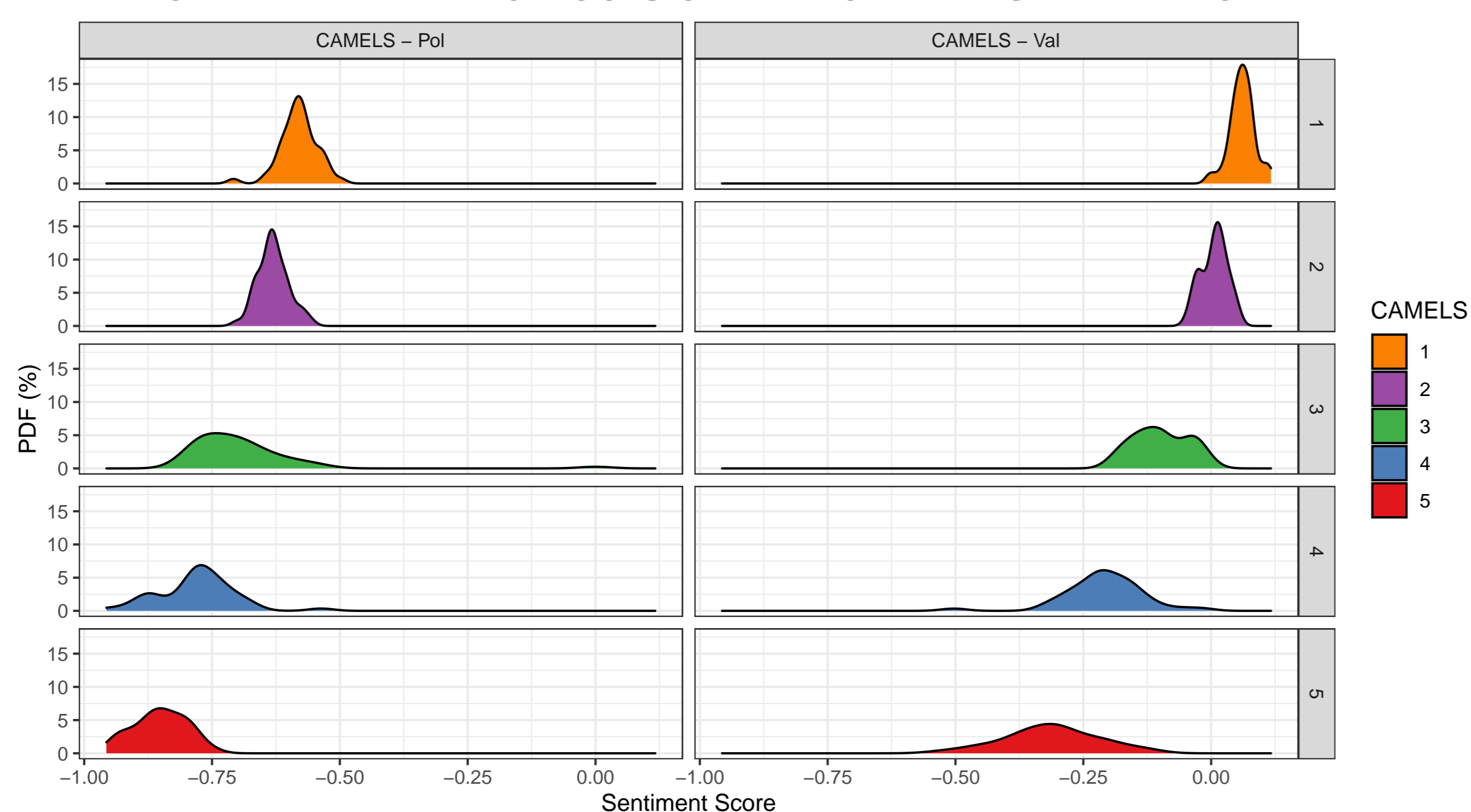
Bank Examination Process

- Full-scope bank exam reports accompany composite and category-specific ratings.
- Capital Adequacy: Representing the ability of the bank to absorb losses.
- Asset Quality: Representing the known and likelihood of losses the bank might face.
- Management: Representing the quality of the management team, functions, and strategy.
- Earnings: Representing the ability of the bank to provide returns on their activities.
- Liquidity: Representing the ability of the bank to absorb short term funding difficulties.

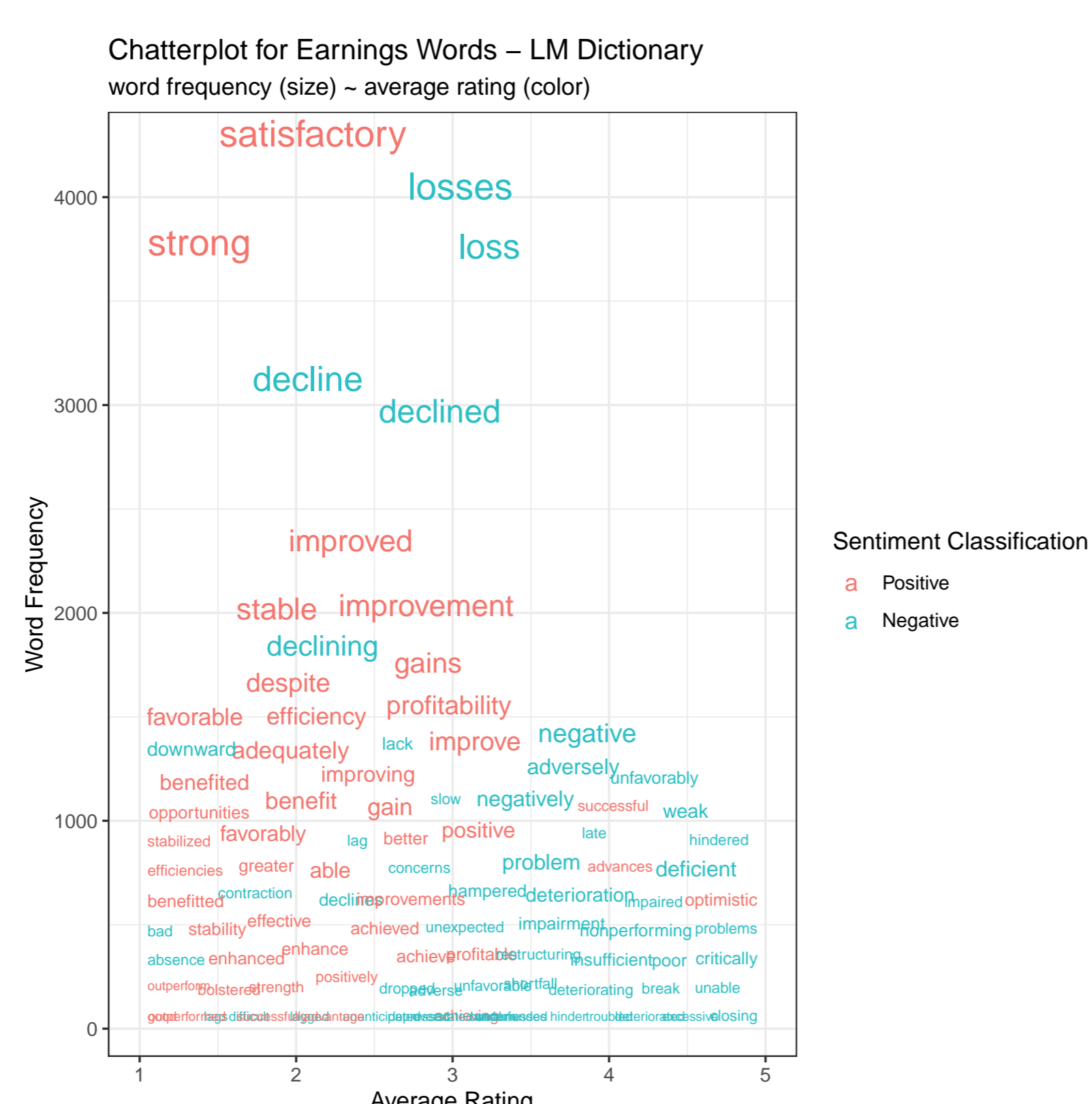
Distribution of CAMELS Ratings (5 is weakest)



LM Polar and Valence Sentiment Distribution



Words used in Earnings Section of Exams



What we do: Question, Approach, Findings

- Study the relationship between sentiment in bank exams and future bank outcomes.
- Sample period is from 2004 to 2016 for small and medium (state-member) banks.
- Control for CAMELS ratings themselves and current bank outcomes (plus fixed effects).
- Main finding: Apart from Liquidity, sentiment (overall and in each section) has statistically (and usually economically) significant relationship with future bank outcomes.

Econometric Specification

$$\text{outcome}_{i,t} = \rho \text{outcome}_{i,t-1} + \beta \text{sentiment}_{i,c,t-1} + \gamma \log(\text{assets}_{i,t}) + \sum_{n=1}^4 \psi_n \text{CAMEL dummy}_{i,n,t-1} + \theta_i + \phi_t + \epsilon_{i,t}$$

for bank i , in period t , for bank exam component c , and where θ_i and ϕ_t are bank and time fixed effects, respectively.

Selected Results

Table 1: Composite Score Regressions

VARIABLES	(1)	(2)	(3)	(4)
	MRA/MRIA Sum Polar	MRA/MRIA Sum Valence	MRA/MRIA Dummy Polar	MRA/MRIA Dummy Valence
Lag sentiment	-3.181*** (0.345)	-6.174*** (0.826)	-0.403*** (0.0299)	-0.812*** (0.0665)
Lag MRA/MRIA Sum	-0.344*** (0.0222)	-0.350*** (0.0221)		
Lag MRA/MRIA dummy			-0.506*** (0.0181)	-0.519*** (0.0180)
CAMELS 2 dummy	1.211*** (0.224)	1.256*** (0.224)	0.0867*** (0.0209)	0.0901*** (0.0209)
CAMELS 3 dummy	4.575*** (0.427)	4.632*** (0.428)	0.160*** (0.0301)	0.161*** (0.0301)
CAMELS 4 dummy	6.488*** (0.697)	6.501*** (0.703)	0.162*** (0.0425)	0.154*** (0.0431)
CAMELS 5 dummy	6.988*** (1.094)	6.909*** (1.095)	0.236*** (0.0547)	0.215*** (0.0559)
Ln(total assets)	0.787*** (0.279)	0.767*** (0.280)	0.0162 (0.0290)	0.0141 (0.0289)
Constant	-6.786* (3.483)	-6.484* (3.496)	0.431 (0.363)	0.468 (0.362)
Observations	5,321	5,321	5,321	5,321
Fixed effects	0.515	0.513	0.611	0.608
R-squared	bank & year bank & year		bank & year bank & year	
Adj. R-squared	0.399	0.396	0.518	0.514

Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2: Earnings Score Regressions

VARIABLES	(1)	(2)	(3)	(4)
	Weighted 4-qtr ROA Polar	Weighted 4-qtr ROA Valence	Weighted 4-qtr PPNR/ Assets Polar	Weighted 4-qtr PPNR/ Assets Valence
Lag sentiment	0.117*** (0.00969)	0.332*** (0.0272)	0.133*** (0.0111)	0.350*** (0.0291)
Lag weighted 4-qtr ROA	0.357*** (0.0243)	0.340*** (0.0247)		
Lag weighted 4-qtr PPNR/assets			0.417*** (0.0290)	0.412*** (0.0292)
CAMELS 2 dummy	0.0237** (0.0108)	0.0229** (0.0108)	0.00232 (0.0141)	0.00114 (0.0141)
CAMELS 3 dummy	0.00979 (0.0202)	0.00954 (0.0201)	-0.0224 (0.0230)	-0.0229 (0.0231)
CAMELS 4 dummy	-0.120*** (0.0312)	-0.112*** (0.0312)	-0.0977*** (0.0271)	-0.0891*** (0.0271)
CAMELS 5 dummy	-0.428*** (0.0546)	-0.414*** (0.0544)	-0.216*** (0.0401)	-0.200*** (0.0403)
Ln(total assets)	0.0848*** (0.0286)	0.0849*** (0.0290)	0.247*** (0.0384)	0.247*** (0.0387)
Constant	-0.866** (0.355)	-0.864** (0.359)	-2.651*** (0.470)	-2.645*** (0.474)
Observations	5,401	5,401	5,401	5,401
R-squared	0.708	0.712	0.786	0.787
Fixed effects	bank & year bank & year		bank & year bank & year	
Adj. R-squared	0.637	0.642	0.734	0.736

Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Conclusion

- We investigate to see if supervisory information helps predict future bank outcomes.
- Even controlling for bank ratings themselves, the answer seems to be YES!
- Bank supervisors play a meaningful role in the surveillance of the banking system by creating and sharing information that is embedded in bank examination reports through the bank examination process.

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• Disclaimer: The paper reflects the views of the authors and does not represent the views of the Federal Reserve Board.