
Information and Incentives Inside the Firm

Evidence from Loan Officer Rotation

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Motivation

- Agents underreport bad news when it reflects poorly on own performance
 - Arthur Andersen destroys documents of Enron audit; police underreports crime
 - Fund managers sell losing stocks before evaluations; money market managers switch into safe investments around disclosures; teachers provide answers

- In practice: rotation common when agency in reporting is likely
 - Auditing (mandatory auditor rotation in France, Germany, Italy, and US)
 - Rating agencies (Moody's and S&P periodically rotate analysts)
 - Corporate Governance (board committee assignment)
 - Bureaucracies (State Government Auditors, IRS, FCC, Department of State, IMF)
 - Commercial lending (loan officers)

- Theories of rotation and incentives
 - Holmstrom (1982): rotation provides "independent readings of the circumstances in which tasks are being carried out and thereby reduces moral hazard costs."

- Evidence?

This Paper

■ Empirical questions:

- Does task rotation affect reporting behavior of corporate loan officers in a commercial bank?
- What is the agency problem? How does rotation mitigate it?

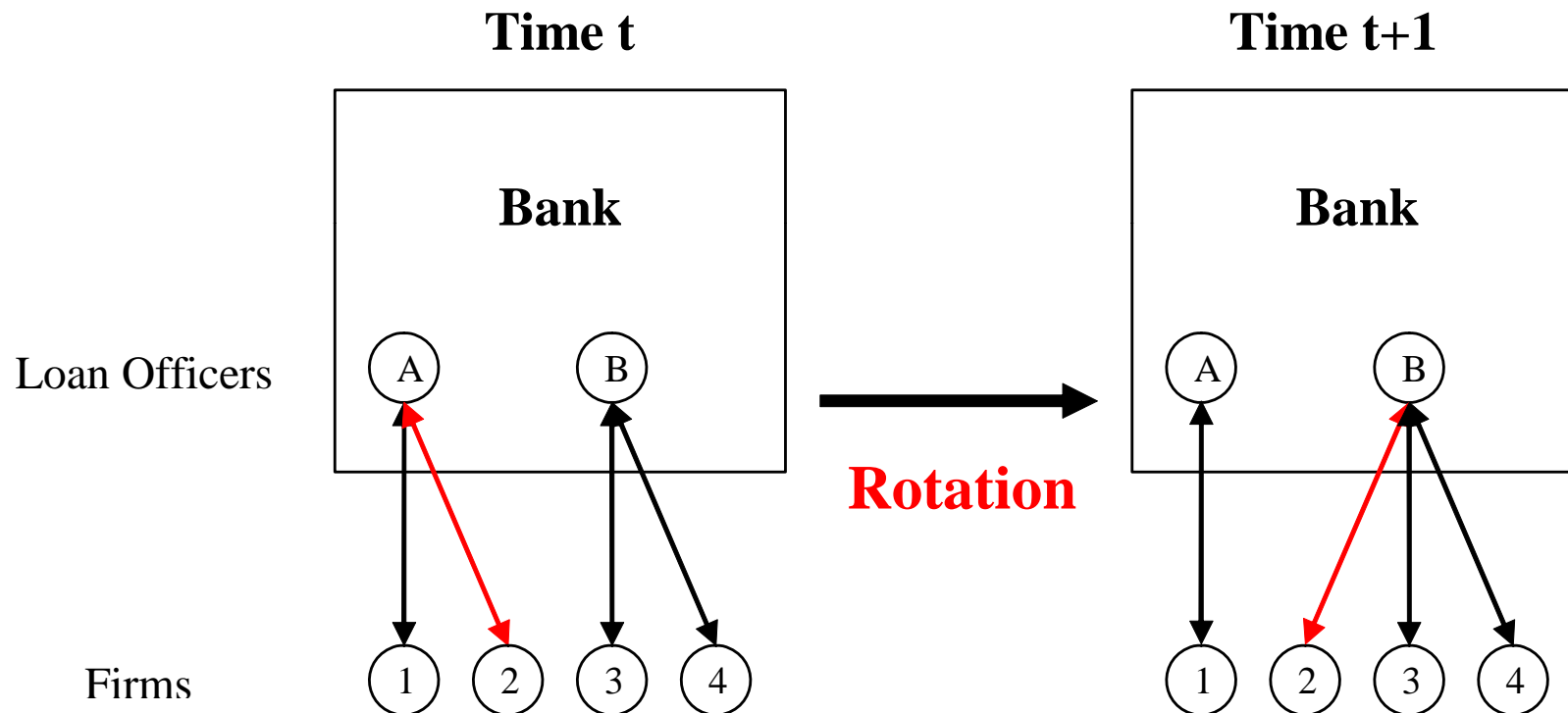
■ Strategy:

- Exploit variation induced by 3-year “random” rotation rule
- Within-firm estimation

■ Preview of Results:

- Threat of rotation induces officers to report bad news (they are responsible for) more accurately
- Career concerns: reporting bad news (they are responsible for) hurts officers’ career in the bank
- Dual-role: Newly assigned officers report bad news without consequences to her, but with consequences predecessor

Rotation: Definition



B

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Empirical Setting

- Small and medium business division of multinational commercial bank
 - Borrowers: sales < \$50 million
 - One loan officer per firm (multiple firms per loan officer)
 - Operations in Argentina (Public Credit Registry)
- Loan officers' tasks
 - Assess repayment prospects and report through monthly risk ratings
 - Recommend lending terms
- Information collection and reporting (risk ratings)
 - Verifiable: Financial statements, value of collateral, cash flows, leverage (computer rating)
 - Non-verifiable: Reliability of statements, quality of management (internal rating)

Note: measure rating information content with ability ability to predict default, impact on lending
- Compensation (no data!)
 - Wage and bonus (increasing in revenue of officer's portfolio)
 - No explicit contract on ratings or their accuracy
- Long tenure
 - All but one of the loan officers in Bank until the end of 7-year sample (follow careers)

Simple Framework: Career Concerns

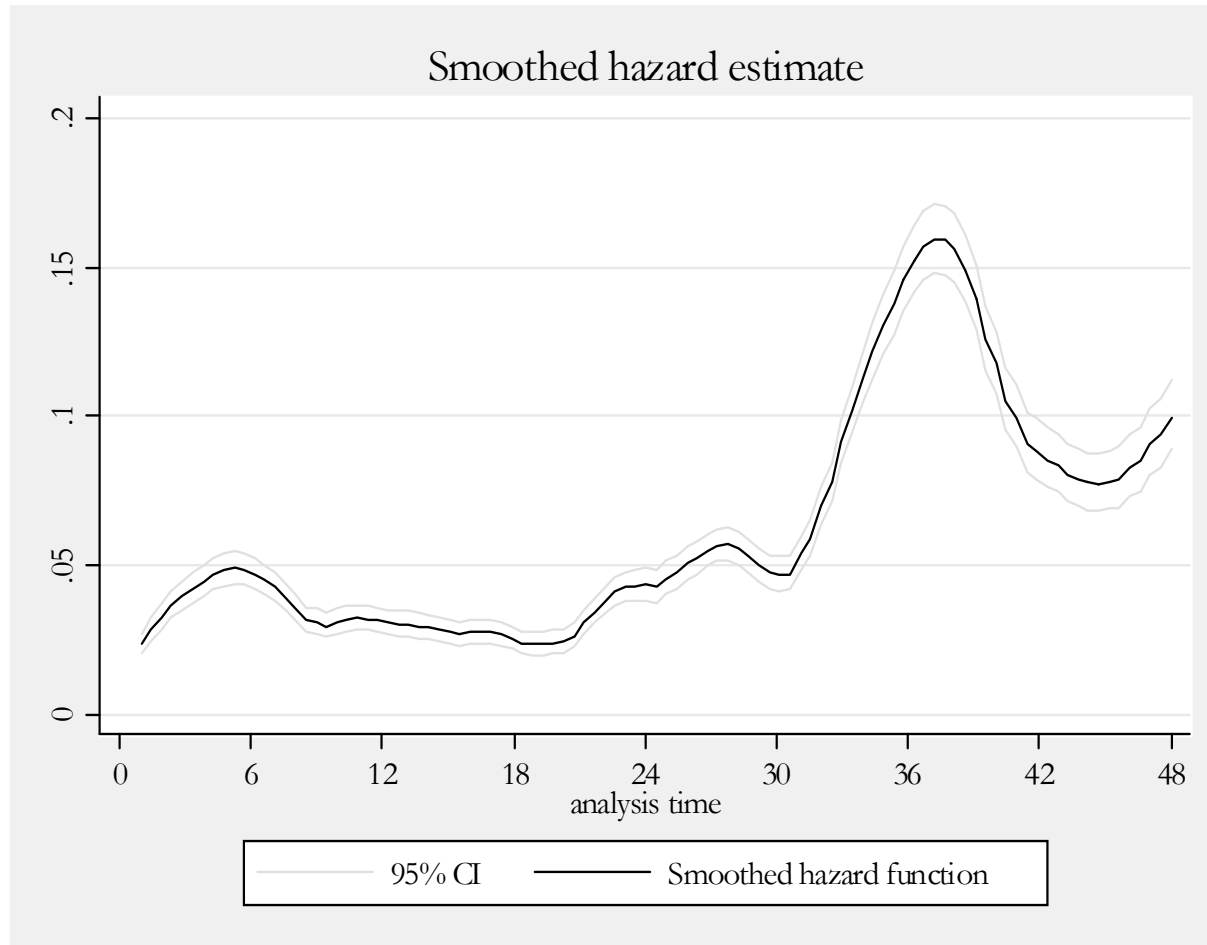
- **Career concerns**
 - No explicit output contingent contract on future payments
 - Officer's expected payoff depends on assessed monitoring ability
- **Incentive problem**
 - Officer that bears responsibility (active) has incentives to hide bad news
- **After rotation, newly assigned loan officer reports**
 - Bears no responsibility, reporting demonstrates ability to detect (passive)
- **In anticipation, incumbent loan officer reports**
 - Threat of "exposure" by successor provides incentives to reveal bad news
- **If news may improve, optimal to delay bad news report**
 - Until rotation is imminent

Three-Year Rotation Policy

- From the Bank's Internal Credit Policies (applied to all divisions, in all countries):
 - “The maximum length of a business relationship for Account Managers is recommended to be 3 years”
- Induces time series variation in the likelihood of rotation

Rotation Hazard and 3-Year Rule

Probability of rotation at month t ,
conditional on relationship survival until month $t-1$



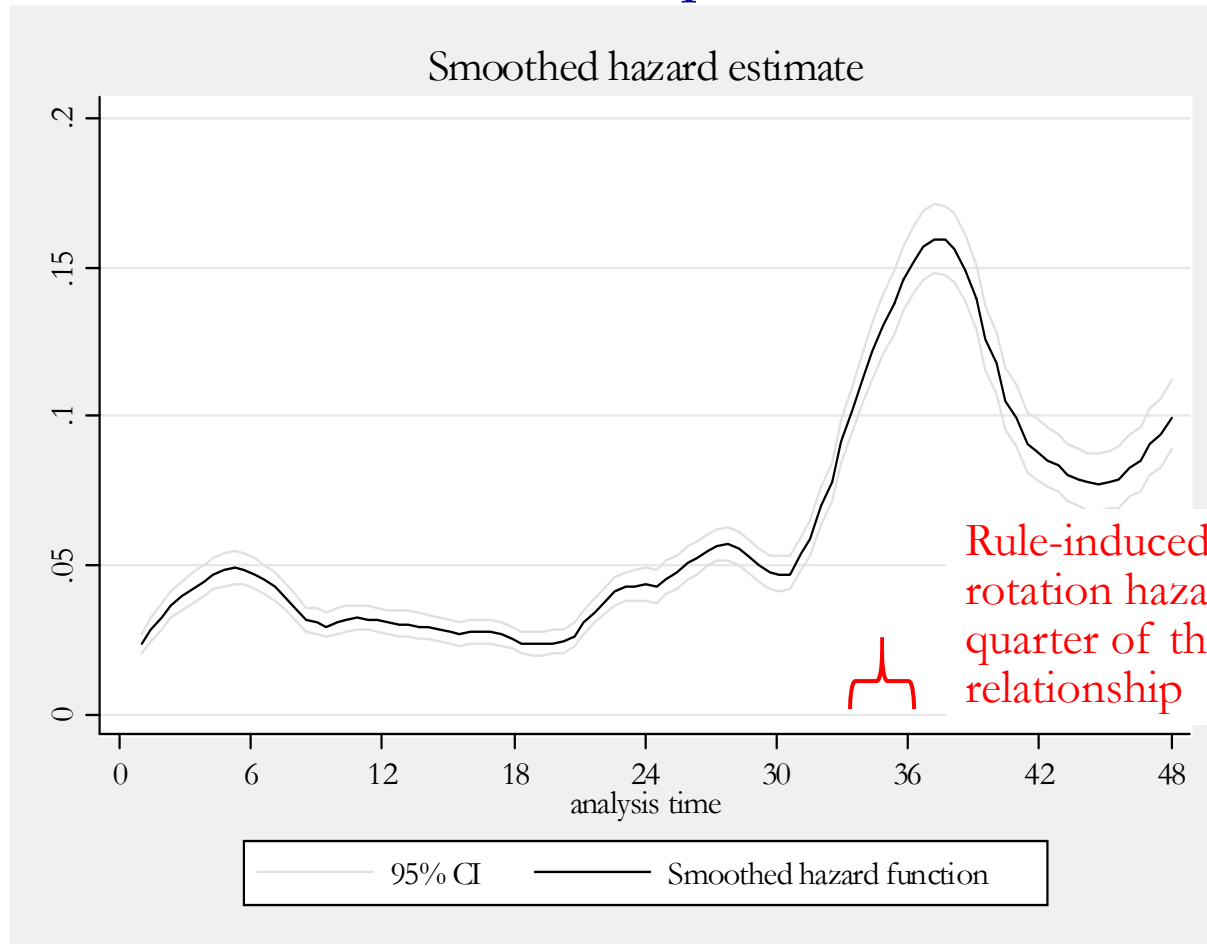
- Rule induces increase in probability of rotation
- Firm reassigned with 58% probability during Q4 of third year (conditionally on relationship reaching 33 months)
- Substantial rotation not related to the rule

Identification: Effect of Rotation

- Three-year rotation rule: exogenous time series variation in rotation probability
 - **Uncorrelated** to firm creditworthiness/demand
 - **Anticipated** by loan officers
 - **Relationship specific** (bank-firm) variation: control for same outcomes, of same firms, at same time, with other banks
 - **Scattered** in calendar time across firms of same officer
 - **“Random”**: disentangle effect of incidence from threat

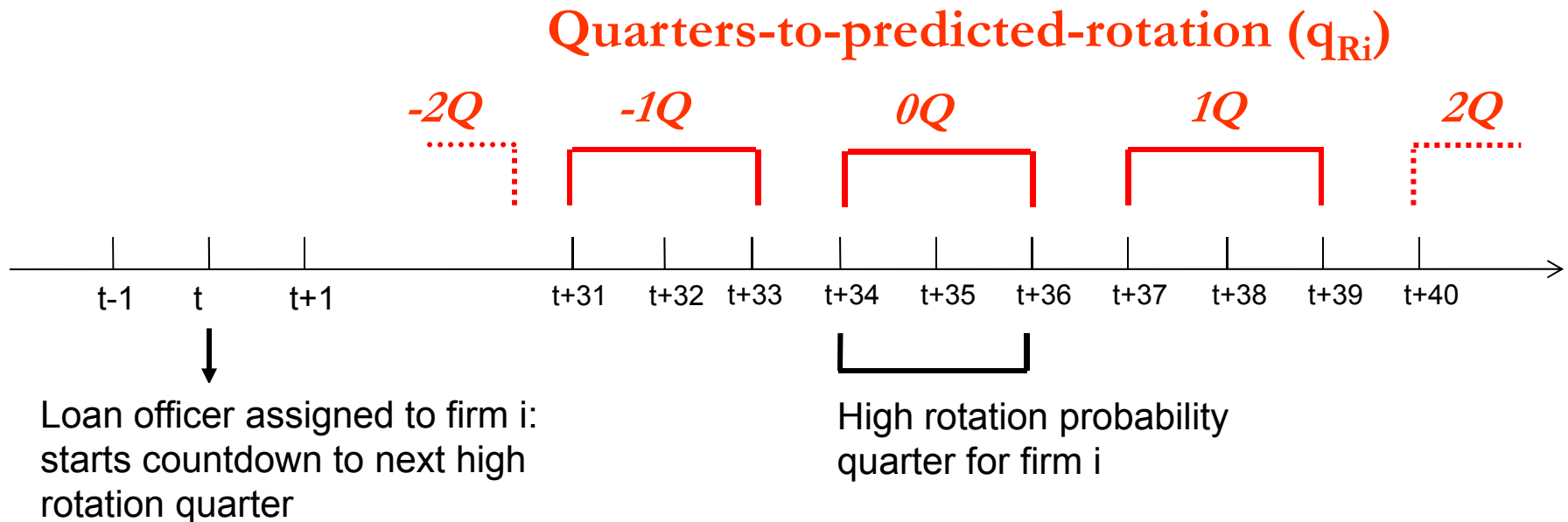
Officer Rotation Hazard and 3-Year Rule

Probability of rotation at month t ,
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Outcomes around High Rotation Probability Quarter

- Identification hypothesis: 3-Year rule induces high rotation probability not correlated with firm level shocks



Caveats

- Counterfactual is not the complete absence of baseline rotation
- Local effect for relationships that reach 33 months
 - Behavior in the absence of rotation? Level effect?
 - Extrapolation to other relationship durations?
 - Optimal frequency/probability?
- Sample starts December 97, so rule-induced rotations start in September 2000
 - Attrition at December 2001 limits analysis after rotation period
 - No bias: attrition determined by date relationship began

Data

- Large multi-national commercial bank (“The Bank”), operations in one country (Argentina)
- Monthly panel
 - 1,248 firms, 100 loan officers, Dec 1997 to Dec 2004
 - Loan officer-firm matches and reassignments (rotation)
 - Internal risk ratings reported by the loan officer (communication)
- Match with Central Bank Credit Registry
 - Name, debt, rating, borrowing from The Bank, month (full match)
 - Monthly risk ratings assigned to firms in the sample by all other banks in the financial system
 - Debt outstanding with every bank
 - Sample: Dec 1997 to Dec 2001

Firm Summary Statistics

LENDING LEVELS (\$000)

	Mean	Median	SD	Min	Max
Outstanding Amount	493	201	1,273	0	72,205
Total Bank Debt reported by Central Ban	2,941	1,336	4,882	0	83,139
Debt Bank/Total Debt	0.27	0.17	0.27	0	1
Number of Lending Relationships	7.52	7.00	4.08	1	34

INTERNAL-EXTERNAL BANK RATINGS

Internal Risk Rating	1.54	1.00	1.11	1	5
Weighted External Risk Rating	1.41	1.00	1.03	1	5
Computer Risk Rating	17.61	17.00	2.79	0	29

DEFAULT MEASURES

In Default	0.09	Subsample: Internal Risk Rating =		
	All	1	2	3
Defaults within 12 Months	0.13	0.10	0.37	0.49

* Based on 22,659 observations in a panel of 1248 firms observed between December 1997 and December 2001

Rotation and Predictive Power of Ratings

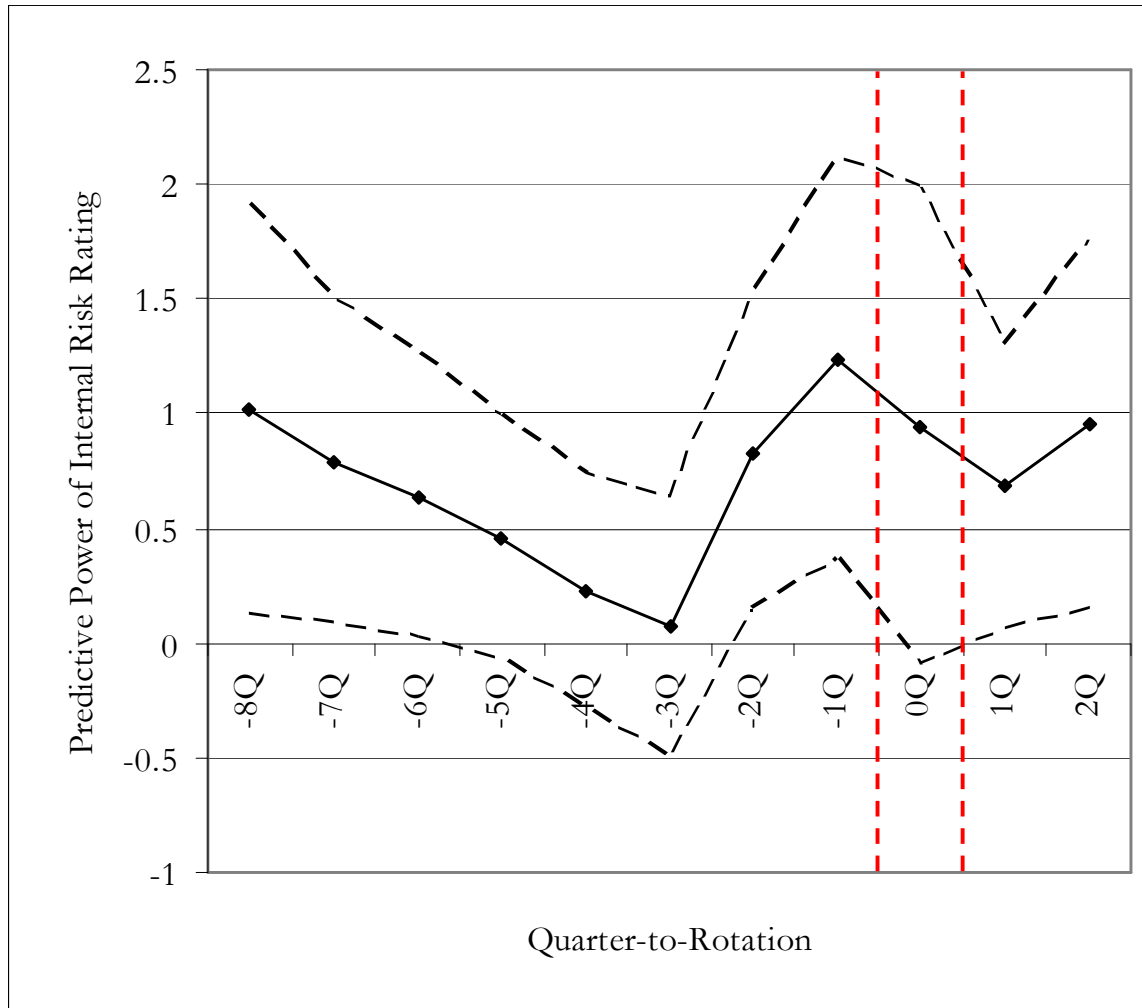
- **Question:** does imminent rotation induce more informative reporting?
- **Specification:** predictive power of ratings on default, relative to rating assigned to same firm by other banks, by quarter-to-rotation

$$\Pr(\text{Default}_{12_{it}} = 1 | \cdot) = \Phi \left[\begin{array}{l} \sum_{s=-8}^2 1[s = q_R] \cdot (\beta_s \text{Internal}_{RR_{it}} + \zeta_s \text{WExternal}_{RR_{it}}) + \\ \beta \cdot \text{Internal}_{RR_{it}} + \zeta \cdot \text{WExternal}_{RR_{it}} + \\ \alpha_{\text{Officer}} + \alpha_{\text{Industry} \times t} \end{array} \right]$$

- Transition to default within next 12 months
- q_R : defined only if relationship reaches 33 months (\neq calendar time)
- 8 quarters prior and 2 after the predicted high rotation quarter
- $\beta_{tR} > 0$: firms with higher risk rating more likely to default by q_R , relative to baseline

Predictive Power of Risk Ratings, by Quarter-to-Rotation

No Rotation Subsample



- Same loan officers, same firms throughout
- $\beta = 0$ (1): rating 2 are 6 (28) percentage points more likely to default than rating 1 firms
- Same (pre) pattern in subsample where loan officer reassigned during 3rd year (as good as random)
- Computer rating has no pattern (verifiable)

Rotation and Ratings Bias

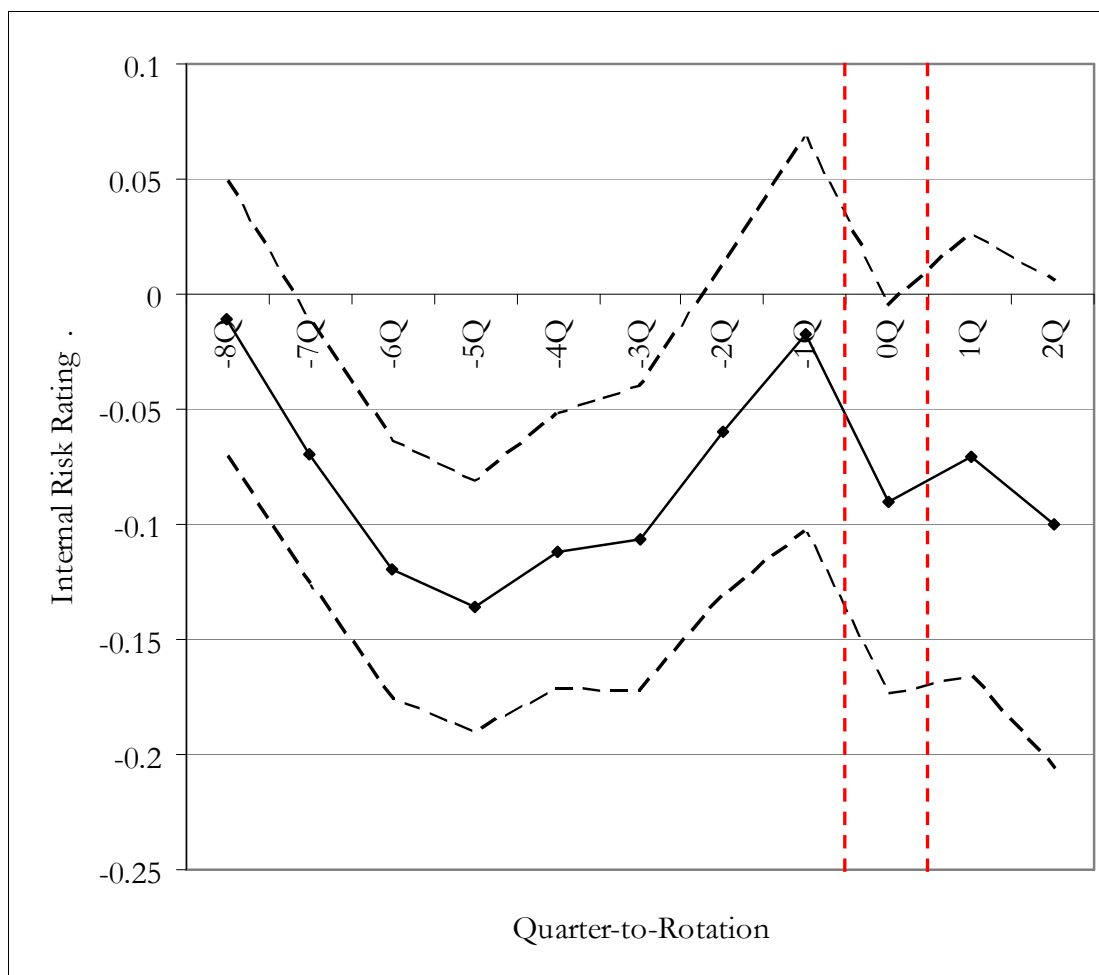
- **Question:** does imminent rotation affect the average level of ratings (bias)?
- **Specification:** average rating, relative to rating assigned to same firm by other banks, by quarter-to-rotation

$$\text{Internal_}RR_{it} = \sum_{u=-8}^2 \gamma_u \cdot 1[u = q_R] + \psi \cdot \text{WExternal_}RR_{it} + \alpha_i + \alpha_{\text{Officer}} + \alpha_{\text{Industry} \times t} + \nu_{it}$$

- γ_{tR} : average credit ratings on each quarter defined by time-to-rotation (t_R)

Average Internal Risk Rating by Quarter-to-Rotation

No rotation subsample



Additional Findings

- Lending more sensitive to changes in ratings when the predictive power of ratings increases
 - Additional information incorporated in lending decisions
- No variation by quarter-to-rotation in:
 - Average external risk ratings, lending by other banks
 - Probability of default
 - Fraction of firm debt with less than one year maturity
- Placebo tests (selection):
 - No patterns when use “fake” rules (12, 18 or 24 rotation rules)

Career Concerns: Equilibrium Predictions

- Effect of reporting bad news on reputation:
 - Downgrade firm later in an assignment → negative impact on reputation
 - Downgrade firm at beginning of assignment → no impact on reputation (positive?)
 - Downgrade by successor (infrequent) → negative (large) impact on reputation

$$\ln(A_{jt}) = \theta_1 [\# DGPRE_{jt-6}] + \theta_2 [\# DGPOST_{jt-6}] + \theta_3 [\# DGSUCC_{jt-6}] + \gamma X_{jt} + \alpha_j + \alpha_t + \nu_{jt}$$

- Career outcomes: future assets under management
- Downgrades, timed relative to high-rotation quarter
 - *#DGPRE* : times officer downgraded during 6 months before high rotation quarter
 - *#DGPOST*: times officer downgraded during 6 months after high rotation quarter
 - *#DGSUCC*: same as *#DGPOST* , but counts on successor

Effect of Bad News Reports on Future Assets under Management (Reduced Form)

Dependent Variable (logs)	# Firms		
	(1)	(2)	(3)
# events pre-High Rotation Quarter loan officer downgrades firm (#DGPRE) 1-6 months	-0.145*** (0.023)		
# events pre-High Rotation Quarter loan officer downgrades firm (#DGPRE) 12-18 months		-0.079** (0.037)	
# events post-High Rotation Quarter loan officer downgrades firm (#DGPOST)	-0.038 (0.083)	-0.056 (0.105)	
# events pre-High Rotation Quarter loan officer's firm downgraded post-High Rotation Quarter (#DGSUCC)	-0.330*** (0.071)	-0.355*** (0.090)	
Controls	Yes	Yes	
Controls × (Dummy=1 if loan officer in highest age quartile)			

Note: all specifications include loan officer fixed effects, month dummies. Controls are the number of high rotation quarters where no bad news report occurred and the average rating of the firms under management. 944 month-loan officer observations. $R^2=90\%$.

Additional Evidence: Cross-Section

- Effect of rotation is larger if officer
 - Was the first assigned to a firm
 - Originated above average amounts on new debt
 - Is younger

Conclusions

- Direct evidence on agency problem in communication inside the firm
- First order impact on capital allocation decisions
- Mechanism: Career Concerns
- Rotation: effective organizational response to agency problem in communication