

# Credit Ratings and Bank Loan Monitoring

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# Banks are information processors

- Economists now see one of the key roles of banks as being information processors
- Banks monitor the businesses they lend to
- This should make banks good risk managers



# Improving Bank Risk Measurement

- In the wake of the financial crisis:
  - Improving risk measurement is a clear priority
  - Are banks as good at risk assessment as economists have thought?
- We examine two simple ways to check on the efficiency of bank risk measurement
  - Tools for bank managers and regulators



# Overview

- Are banks superior monitors of commercial loan borrowers?
  - Substantial empirical evidence that they are
    - Lummer and McConnell, Mester et al
  - But are they as good as they could be?
- Received wisdom suggests that banks have private information about borrowers that other lenders do not have – bank ratings should be more accurate measures of creditworthiness than, e.g., credit bureau ratings
  - This is the premise of current bank regulation
  - And of most internal bank management



# Overview, continued

- Our evidence suggests that at least one of our two banks has private information
  - But these bank ratings do not contain as much information as they could!
  - Our procedures should be used by banks (and their regulators) to help them improve their ratings.
  - And regulators should use outside information as well as bank internal ratings to evaluate bank loan portfolios



# Bank credit ratings of commercial loans: how informative are they?

- Our main test:
  - Use bank credit ratings to forecast credit bureau ratings and vice versa.
  - Berger, Davies and Flannery, 2000
- Additional test: Use bank credit rating and credit bureau ratings to forecast loan default.
  - Weakness: defaults are rare, tend to bunch temporally, and apply most to riskiest loans



# Credit bureau is owned by the banks

- The credit bureau uses efficient econometric techniques with available public information to create ratings that predict bankruptcy
  - Public info includes annual data on firm income
- Banks have access to the credit bureau data



# A little theory:

- We develop a standard decision-theoretic framework to include public (credit bureau) and private exclusive (bank) information
  - Banks and credit bureau use Kalman filter to optimally incorporate their information
  - Bank knows credit bureau information
  - Information modeled as random walk with noise
- We use this theory to set up our regressions and also to create simulations to analyze how our real-world data might differ from the theory





# According to the theory:

- If a bank has both:
  - Its own information about a borrower (based on its relationship)
  - And the public information that credit bureaus provide
- Then
  - The bank's ratings should forecast the credit bureau's ratings next period and the credit bureau's ratings shouldn't forecast the bank's ratings – Granger causality should hold
  - Regulators should use the bank's ratings only



# Data

- From 1997Q3 to 2000Q1 or 2000 Q2
- Credit ratings, from 2 of the 4 Swedish banks & the main Swedish credit bureau
  - 40 thousand borrowers, bank A
  - 20 thousand borrowers, bank B
- Our theory shows that at best private information should predict 25 percent of residual sum of square



**The rating systems are ordered categories, not continuous variables.  
Information is lost.**

Bank B Credit Ratings			
Rating	Observations	Frequency	Cumulative
1	45	0.09	0.09
2	1,358	2.58	2.66
3	12,775	24.25	26.92
4	30,438	57.79	84.71
5	6,286	11.93	96.64
6	958	1.82	98.46
7	811	1.54	100.00
Total	52,671		



**Are lags of the bank rating able to predict CB ratings and vice versa?  
 Contrary to our theory, both answers are yes.**

<b>Table 12: Regressions with all borrowers, Credit Bureau and Bank B                      1997Q3 to 2000Q1, robust standard errors</b>						
	<b>Credit Bureau Rating</b>			<b>Bank B Rating</b>		
<b>constant</b>	0.449 (.00593)	0.941 (.0144)	0.700 (.0476)	.162 (.00444)	.286 (.00703)	.279 (.00760)
<b>Lag of CB rating</b>	0.886 (.00142)	0.858 (.00169)	0.857 (.00170)		-.01907 (.0026)	dummies
<b>Lag of Bank B rating</b>		-0.102 (.00251)	dummies	.960 (.00116)	.947 (.00133)	.947 (.00134)
<b>Residual Sum of Squares</b>	30607	30163	30147	4981	4940	4939
<b>observations</b>	116445	116445	116445	116445	116445	116445
<b>Adjusted Rsq</b>	.7802	.7833	.7835	.9079	.9087	.9087



Table 13. Percent Reduction in Residual Sum of Squares due to lags of Bank or Credit Bureau				
Dependent Variable	Credit Bureau Ratings	Credit Bureau Ratings	Bank A Compressed Ratings	Bank B Ratings
Explained by one period lag of:	Bank A Compressed Ratings	Bank B Ratings	Credit Bureau Ratings	Credit Bureau Ratings
Total	1.00	1.45	2.67	0.82
Small	0.93	1.21	3.01	0.58
Medium	1.04	1.40	2.63	0.90
Large	1.01	1.52	2.08	0.68




# Banks do not pass stringent test

- The credit bureau data has some power to predict future movements in bank credit ratings
- Bank B has better ability to predict credit bureau than vice versa
- Bank A does not



# Robustness check

- Ordered logit regressions very similar to OLS for credit bureau and bank B
  - Ordered logit regressions do not require that the ratings related to one another linearly
  - But linearity looks reasonable
- Ordered logit regressions somewhat more favorable to bank A in comparison with credit bureau for large borrowers 

# Why are credit bureau ratings informative about future bank credit ratings?

- Credit bureau ratings forecast bank credit ratings. Why?
- Credit ratings are updated at different points in time by different monitors. Thus the credit bureau may have updated its credit rating more recently than the bank, allowing it to forecast the bank rating.
- Credit ratings are categorical variables, not continuous variables. In moving from continuous variables to categorical variables, may have lost a lot of information, making the credit bureau data more valuable.
- Bank loan officers may not be efficient at combining the credit bureau data with the bank data





# In very recent work, we show:

- Even if we condition results on changes in bank ratings, credit bureau ratings still have predictive power
- Even if we use the credit bureau numerical ratings (.5 to 100) bank ratings are still predictive
- We tentatively believe banks have private information but use it inefficiently



## Second test:

### We test the ratings ability to predict loan default and bankruptcy

- We use a Cox hazard model to test the ability of bank and credit bureau ratings to predict
  - loan default (bank definition)
  - bankruptcy (credit bureau definition)
- Overall, the credit bureau ratings predicts BOTH loan default and bankruptcy substantially better than either bank's ratings



# Conclusions

- Bank ratings, in the cases we examine, should be supplemented by credit bureau ratings both internally and by regulators
- These banks should apply these and similar tests to their ratings and do their best to improve
- These tests should be applied to other banks

