

# The Effect of TARP on Bank Risk-Taking

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# Introduction

- The Troubled Asset Relief Program (TARP) of the U.S. Treasury was authorized to make \$700 Billion in bank capital injections, which began in October 2008
- Purpose of program was originally stated as recapitalization, but banks were also under pressure to increase lending

*“As these banks and institutions are reinforced and supported with taxpayer funds, they must meet their responsibility to lend.”*

Anthony Ryan, Acting Treasury Under Secretary  
October 2008



# Motivation

- These two social objectives likely had opposing effects on bank risk-taking
  - Recapitalization would lead to less risk-taking
  - Macro-stabilization would lead to more risk-taking
- Greater risk taking with government funds in the absence of greater lending may also be a sign of *moral hazard*



# Main Question

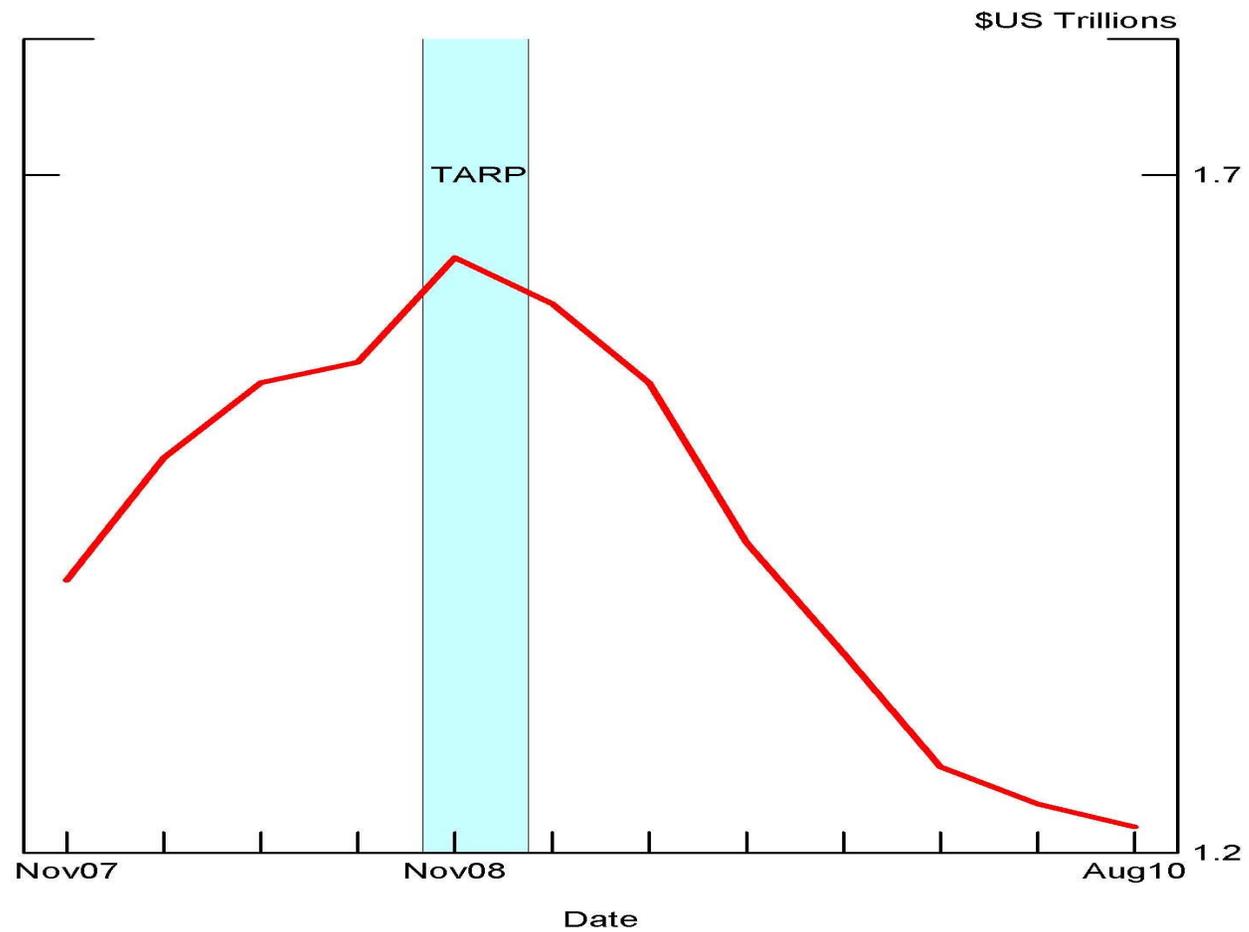
- How did the TARP capital infusions affect bank risk-taking?
- Specifically, how did the risk ratings of commercial and industrial (C&I) loan originations change following the capital infusions?
- How did this compare to changes in lending?



# Main Findings

- Relative to non-TARP banks, the risk rating of loan originations
  - *increased* at large TARP banks
  - *decreased* at small TARP banks
- Suggests that large may have had
  - greater pressure to expand lending, or
  - greater moral hazard

# C&I Loans Outstanding





# Data

- Survey of Terms of Business Lending (STBL)
  - Survey of one week each quarter
  - Risk rating: 1 is least risky, 5 is most risky
- Call Report: bank size and capitalization

37 TARP banks and 44 Non-TARP banks

- 12 Quarters: 2007Q4 – 2010Q3
- 187,761 loan-level observations



# Measuring Risk-Taking

- Forward-looking measure of risk-taking
  - Versus backward-looking measure, such as non-performing loan ratio, e.g., Salas and Saurina (2003)



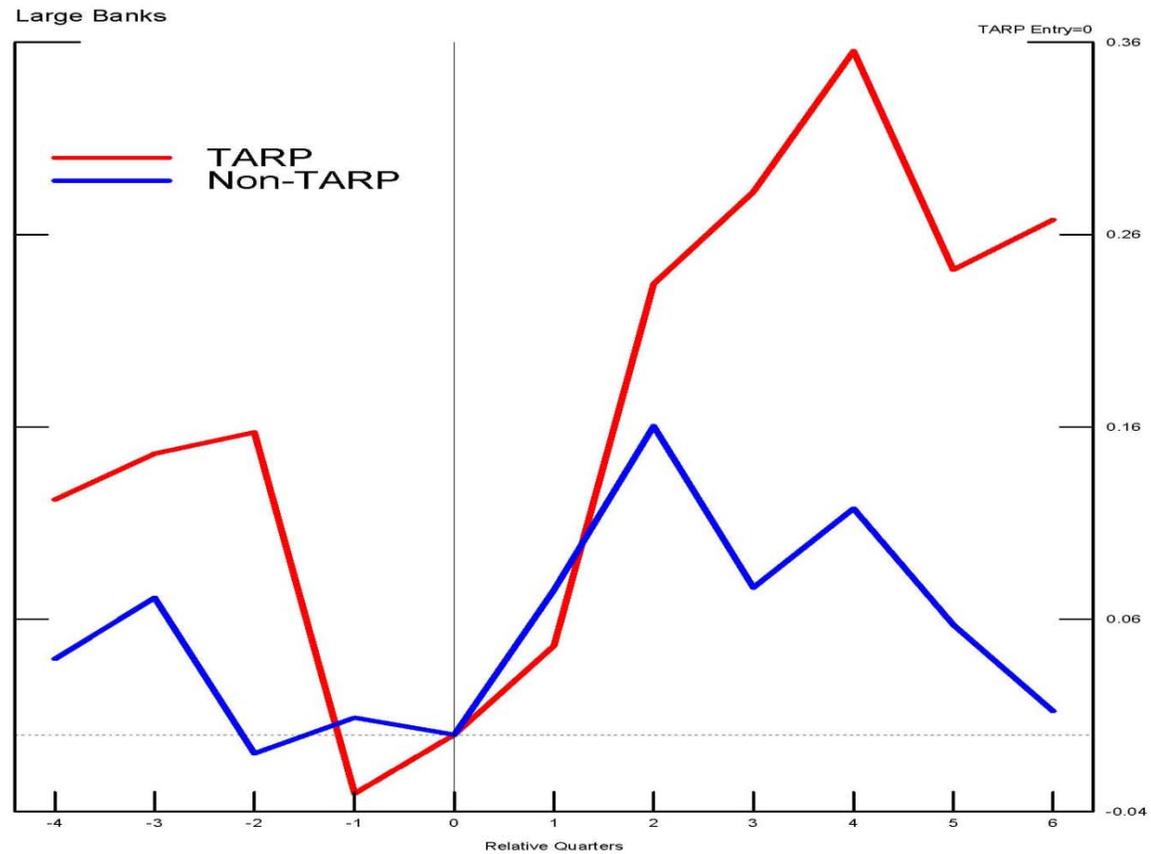
# Key Comparison

- Change in average risk ratings for TARP banks relative to non-TARP banks following the period of capital infusions
- Match TARP and non-TARP banks based on size and timing of capital infusion
- Stratify banks by bank size
  - Large (>\$10 Billion)
  - Medium (\$2.5 Billion to \$10 Billion)
  - Small (<\$2.5 Billion)

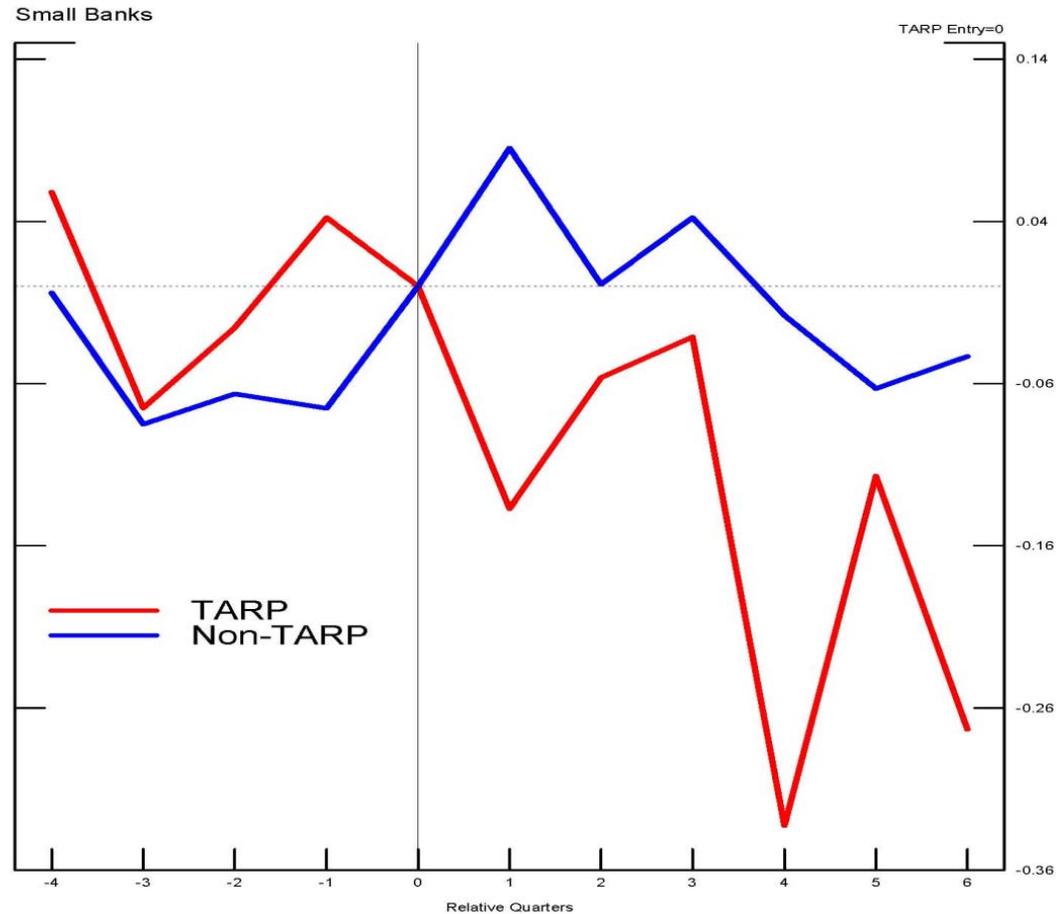
# Difference-in-differences

	<u>TARP Recipient</u>	<u>TARP – Non-TARP</u>
	Mean	Mean
<b>After TARP Period</b>		
<i>Loan Characteristics</i>		
Risk Rating (1 to 5)	3.462	0.232***
Interest	3.876	0.090***
Commitment (0/1)	0.942	0.166***
Log of Loan Size (\$)	11.194	0.104***
<i>Bank Characteristics</i>		
Ln of Bank Size (\$1000)	18.728	1.185***
Capitalization (ratio)	9.524	-2.340***
<b>After – Before</b>		
<i>Loan Characteristics</i>		
Risk Rating	0.094***	0.075***
Interest	-1.850***	0.164***
Commitment	0.010***	0.022***
Ln(Loan Size)	0.033**	0.062***
<i>Bank Characteristics</i>		
Ln(Bank Size)	0.321***	0.037***
Capitalization	-0.002***	0.008***

# Relative Risk at Large Banks



# Relative Risk at Small Banks



# Loan-Level Analysis

- Evaluate change in risk ratings following TARP while controlling for other bank and loan characteristics

$$\begin{aligned} \text{Risk}_{i,t,l} = & \beta_1 \text{TARP recipient}_i + \beta_2 \text{Ln}(\text{Bank Size})_{i,t,l} + \beta_3 \text{Capitalization}_{i,t,l} \\ & + \beta_4 \text{Commitment}_{i,t,l} + \beta_5 \text{Maturity}_{i,t,l} + \beta_6 \text{Ln}(\text{Loan Size})_{i,t,l} \\ & + \beta_7 \text{bank}_i + \beta_8 \text{quarter}_t + \epsilon_{i,t,l} \end{aligned}$$

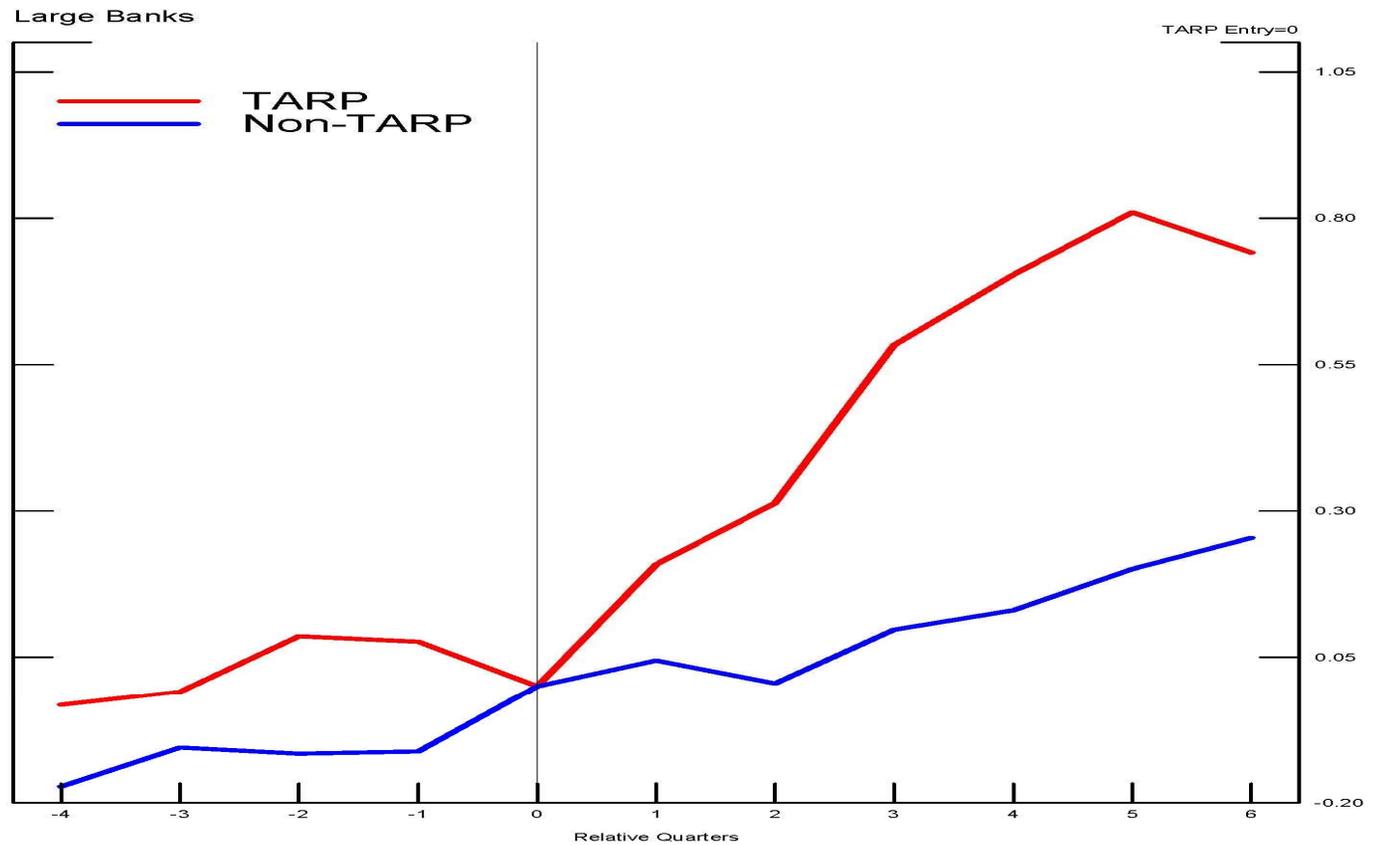
# Risk Ratings for Large Banks

	Large Banks	
	(1)	(2)
<i>Bank Characteristics</i>		
TARP Recipient	0.086***	0.079***
Ln(Bank Size)	0.046***	0.049***
Capitalization	0.008***	0.006***
<i>Loan Characteristics</i>		
Commitment		0.233***
Ln(Loan Size)		-0.024***
<i>Bank Fixed Effects</i>		
	Y	Y
<i>Time Fixed Effects</i>		
	Y	Y
Number of Observations	212636	212636
Adjusted R-Squared	0.200	0.211

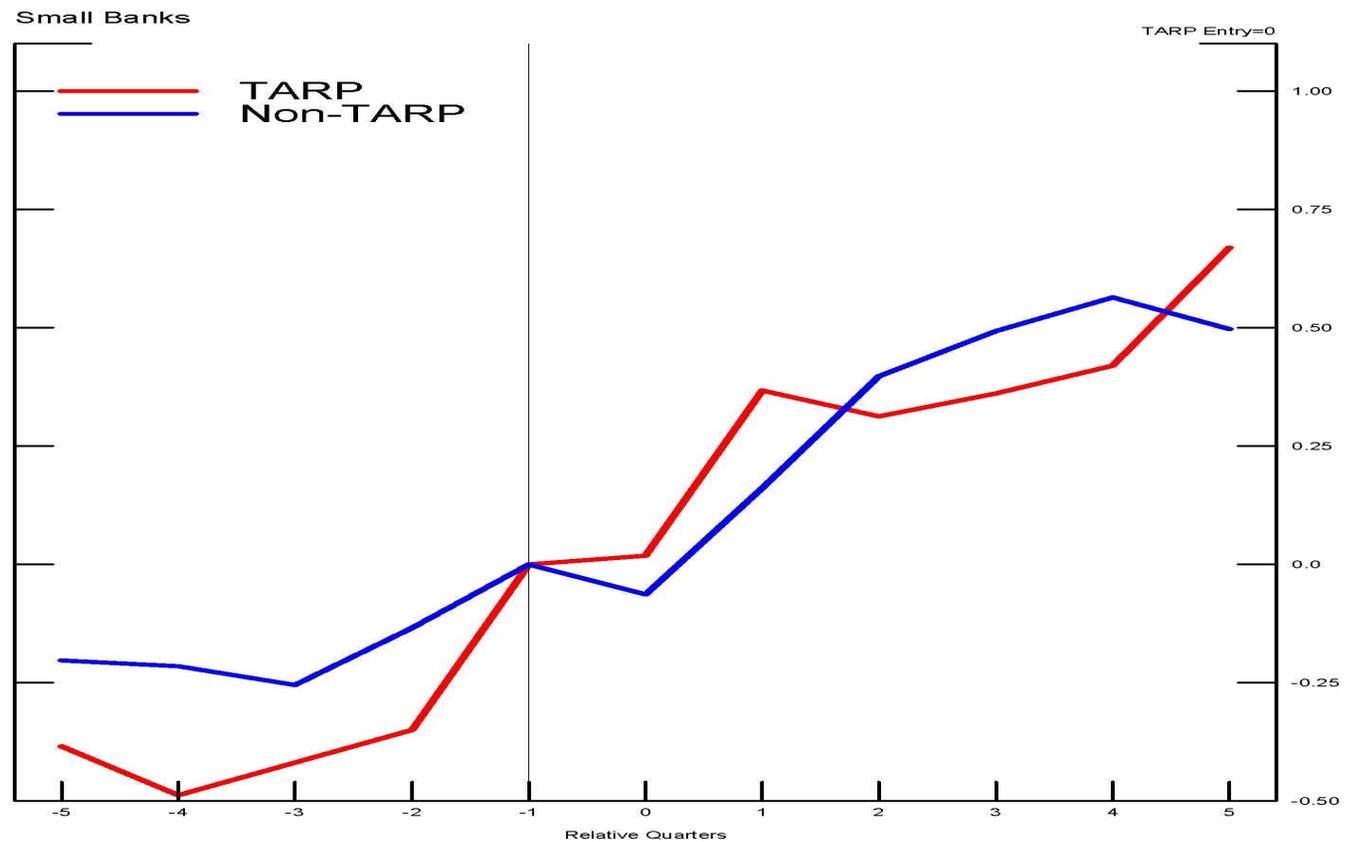
# Risk Ratings for Small Banks

	Small Banks	
	(1)	(2)
<i>Bank Characteristics</i>		
TARP Recipient	-0.060*	-0.087***
Ln(Bank Size)	-0.087	-0.058
Capitalization	-0.001	-0.004
<i>Loan Characteristics</i>		
Commitment		0.020
Ln(Loan Size)		-0.007
<i>Bank Fixed Effects</i>	Y	Y
<i>Time Fixed Effects</i>	Y	Y
Number of Observations	11867	11867
Adjusted R-Squared	0.315	0.330

# Interest Spread at Large Banks



# Interest Spread at Small Banks



# Risk Ratings with Ordered Logit

	Large Banks (1)	Small Banks (2)
<i>Bank Characteristics</i>		
TARP Recipient	1.329***	0.307***
Ln(Bank Size)	1.035***	2.836***
Capitalization	1.000	0.920***
<i>Loan Characteristics</i>		
Commitment	2.995***	1.084*
Ln(Loan Size)	0.930***	0.984
<i>Time Fixed Effects</i>		
	Y	Y
Number of Observations	212636	11867
Adjusted R-Squared	0.031	0.031

# Risk Ratings with Dollar Amount

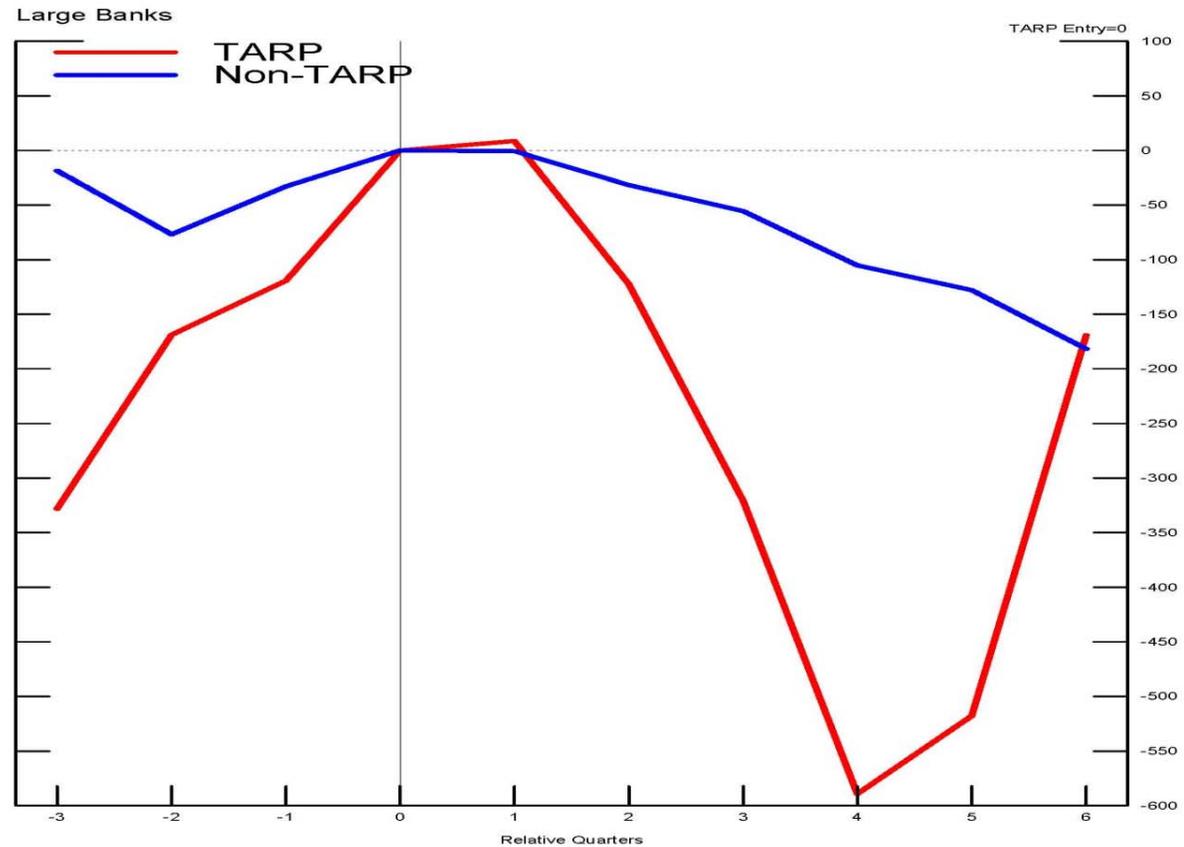
	Large Banks (1)	Small Banks (2)
<i>Bank Characteristics</i>		
Ln(TARP dollar amount)	0.004***	-0.003*
Ln(Bank Size)	0.049***	-0.088
Capitalization	0.006***	-0.003
<i>Loan Characteristics</i>		
Commitment	0.233***	0.021
Ln(Loan Size)	-0.024***	-0.007
<i>Bank Fixed Effects</i>	Y	Y
<i>Time Fixed Effects</i>	Y	Y
Number of Observations	212636	11867
Adjusted R-Squared	0.212	0.330



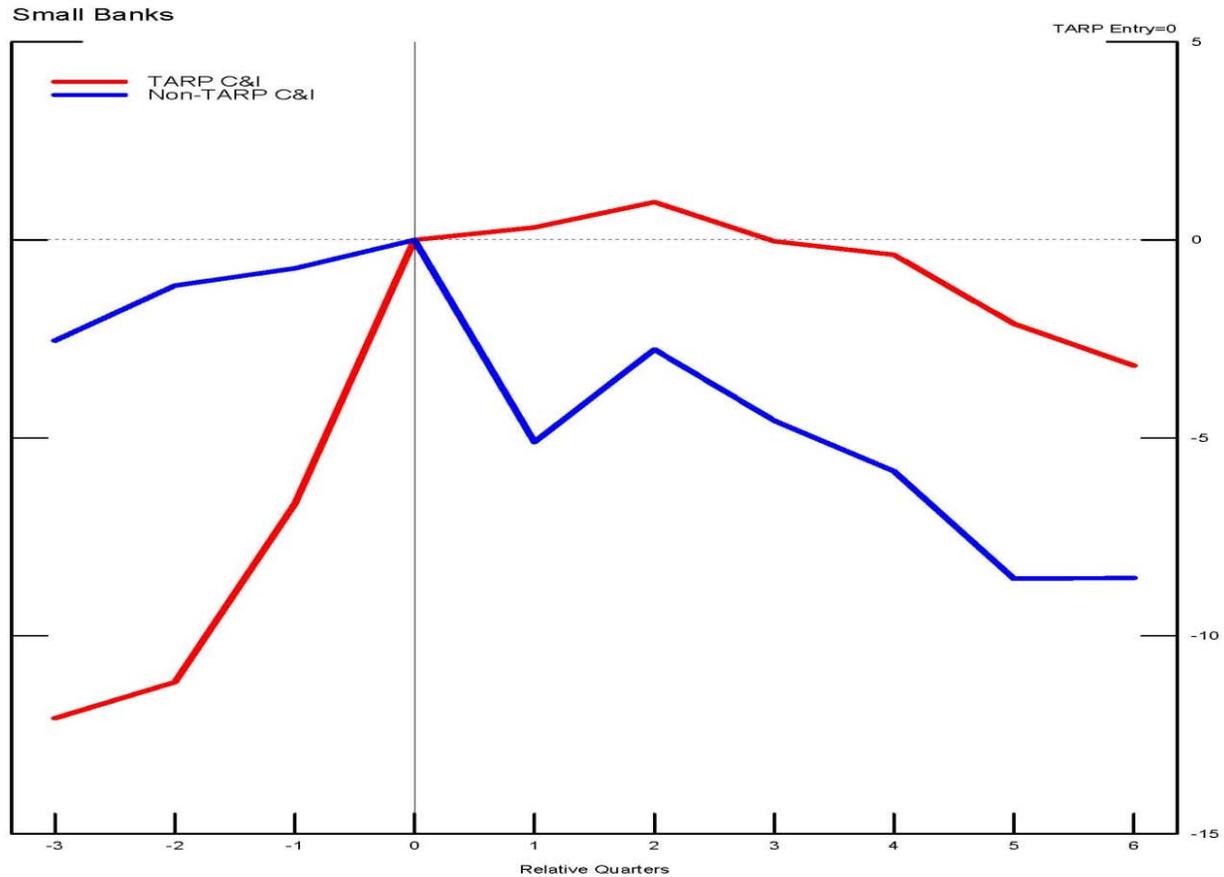
# Lending and Risk-Taking

- Did the risk correspond to more lending?
  - Macro-stabilization
  
- Or just riskier loans?
  - Moral hazard

# C&I Loans at Large Banks



# C&I Loans at Small Banks





# Matched Sample Analysis

- Propensity score matching used to control for selection bias
- Results consistent with previous regression results
- Reduced significance for small banks, likely due to reduced sample size



## Conclusion

- Relative to non-TARP banks, we find that loan risk *increased* at large TARP banks but *decreased* at small TARP banks
- Conflicting objectives of recapitalization and macro-stabilization may have mixed effects on bank risk-taking
- Lack of lending suggests moral hazard for the large banks