
TARP Consequences: Lending and Risk Taking

Ran Duchin

Denis Sosyura

University of Michigan

Motivation

- Troubled Asset Relief Program (TARP)
 - Stated goals: stimulate lending and increase financial stability

- Capital provided under attractive terms, and banks are not required to report its use
 - “This is opportunity capital. They didn’t tell me I had to do anything particular with it.”
- *Chairman of PlainsCapital Bank*

 - “Make more loans?” “We’re not going to change our business model or our credit policies to accommodate the needs of the public sector”
- *Chairman of Whitney National Bank*

Research Questions

1. Did TARP capital infusions stimulate lending?
 - Bank liquidity a key factor in lending (e.g., Puri et al 2010)
 - Incentives for alternative uses of funds
2. Did the bailout change bank risk taking behavior?
 - Moral Hazard (Merton 1977; Flannery 1998)
 - Government monitoring and restrictions on incentive pay
3. Did bank governance matter?

Data

- Application-level data on over 25 million mortgages from the Home Mortgage Disclosure Act Database (2007-2009)
 - Borrower income, gender, and demographics
 - Property location by U.S. Census tract (area with about 4,000 residents)
 - Bank decision on the application
- Data on 28 thousand large corporate loans from DealScan
 - Originating bank, recipient firm, date of origination, and loan characteristics
- Housing market data: home vacancies, housing units, home price index, population, per capital income, and unemployment

Identification

- Isolate the effect of TARP on credit supply by controlling for loan demand
- For retail loans: study loan originations by TARP recipients vs. nonrecipients before and after TARP injections
 - Applications submitted in the same housing market
 - Loan applications with similar observable characteristics
 - Banks matched on financial condition and performance
- For corporate loans: fraction of loans originated by TARP recipients vs. nonrecipients for a given corporate borrower

Lending

Dependent variable = indicator equal to 1 if a loan application is approved

Model	(1)	(2)	(3)	(4)	(5)
After TARP	-0.022 [1.607]	-0.034** [2.156]	-0.009 [0.915]	-0.048*** [2.953]	-0.007 [0.686]
After TARP x TARP recipient	0.015 [0.993]	0.006 [0.334]	0.006 [0.404]	-0.002 [0.150]	0.019 [1.439]
Bank level controls	No	No	Yes	Yes	Yes
Loan application controls	No	No	Yes	Yes	Yes
Housing market controls	No	No	No	No	Yes
Bank fixed effects	Yes	Yes	Yes	Yes	Yes
Tract fixed effects	No	Yes	No	Yes	No
Observations	25,462,180	25,349,530	23,628,030	23,628,030	11,206,070

Alternative Hypotheses

- Unobservable counterfactual
 - Collect data on banks that applied for TARP, were approved, but did not receive TARP capital
- Different borrower clienteles of TARP recipients
 - Focus on application approvals within the same housing market
 - No significant difference in loan demand between recipient and nonrecipient banks after TARP
- Sample selection
 - Matched sample based on size, capital adequacy, asset quality, earnings, liquidity, and sensitivity to market risk

Credit Rationing and Risk

	After TARP	After TARP x TARP recipient	Observations	R-Squared
Loan-to-income ratio rank				
1	-0.034*** [6.593]	-0.029*** [4.366]	2,552,800	0.247
2	0.000 [0.001]	-0.012*** [3.910]	2,596,540	0.218
3	0.001 [0.271]	-0.013*** [4.471]	2,530,580	0.232
4	-0.015*** [3.033]	0.002 [0.412]	2,446,980	0.231
5	-0.018*** [3.523]	-0.002 [0.288]	2,399,280	0.226
6	-0.017*** [3.141]	-0.012* [1.857]	2,345,080	0.222
7	-0.023*** [4.044]	0.005 [0.783]	2,319,740	0.212
8	-0.028*** [4.619]	0.007 [0.965]	2,292,140	0.211
9	-0.042*** [6.637]	0.025*** [3.384]	2,290,620	0.206
10	-0.089*** [14.199]	0.091*** [12.355]	2,375,000	0.231

Risk of Investment Portfolios

- TARP banks increase allocations to investment securities
- Most capital goes to equities, MBS, and corporate debt
- The combined weight of these assets increased by 10.0%, displacing Treasury bonds, short-term paper, and cash equivalents
- Using diff-in-diff estimation, the average interest yield on TARP recipients' investments increased by 31.5% after the bailout

Bank Risk

Risk Measure	St. deviation of ROA	St. deviation of earnings	Capital asset ratio	Z-Score	Beta
After TARP	0.002** [2.230]	0.002** [2.267]	0.001 [1.436]	-0.147*** [9.086]	0.105*** [3.790]
After TARP x TARP recipient	0.002*** [2.593]	0.002*** [2.854]	0.017*** [10.298]	-0.221*** [4.117]	0.147*** [3.742]
Liquidity	0.470 [1.458]	0.470 [1.458]	0.000 [0.003]	-0.616 [0.819]	-1.002*** [14.510]
Crisis	0.000*** [2.810]	0.000*** [2.849]	-0.000*** [8.207]	-0.001*** [13.766]	0.000 [0.872]
Size	-0.006*** [2.896]	-0.005*** [2.786]	-0.136*** [19.476]	-0.191*** [4.793]	0.274*** [3.251]
Bank fixed effects?	Yes	Yes	Yes	Yes	Yes
Observations	101,066	101,066	101,313	100,469	6,847
R-squared	0.477	0.477	0.862	0.761	0.645

Economic Interpretation

- TARP recipients significantly reduced leverage: capital asset ratio increased from 9.9% before TARP to 10.9% after
- However, the reduction in leverage was more than offset by an increase in asset risk in loans and security investments
- Net effect: beta of TARP banks increased from 0.80 in 2008 to 1.01 in 2009
- Strategy consistent with investing in higher-yield assets, while improving capital ratios monitored by the regulators

Governance

- Governance measures:
 - CEO/Chairman duality
 - Board expertise
- Banks with weaker governance:
 - Greater increase in risk taking
 - Lower credit origination
- Overall, internal governance can act as an internal control mechanism in the presence of loose federal regulation

Conclusion

- Liquidity shocks have an asymmetric effect on lending
- Banks' strategic response to capital requirements erodes the efficacy of this mechanism in risk regulation
- Moral hazard outweighs government monitoring and institutional restrictions