Deposit-lending synergies and bank profitability

Abstract
Banks accept deposits and often lend via commitments. It has been argued that there are synergies between transaction deposits and loan commitments; and that the volatility of banks' stock returns declines when these two liquidity risks are taken together. We examine whether such deposit-lending synergies reflect on bank profitability levels, and whether the synergies impact differently the bank profitability levels during financial crises. We find that the deposit-lending synergies translate to increased profitability only for small publicly traded banks. We do not find evidence on whether any pre-crisis deposit-lending synergies translate to profitability either during or after a crisis.

Keywords: Bank profitability; Deposits; Loan commitments; Financial crises
JEL Classification: G21; G24; G28

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1. Introduction

Banks accept deposits and issue loans. Financial intermediation theory indicates that providing liquidity is an important reason why banks exist. Diamond and Dybvig (1983) present a model where banks create liquidity by financing illiquid assets such as loans with liquid liabilities such as deposits. Banks often lend via commitments reported as off-balance sheet activities. [1] Holmstrom and Tirole (1998) and Kashyap, Rajan, and Stein (2002), hereafter KRS, show how banks can provide liquidity to borrowers using these off-balance sheet items. On the one hand, liquidity creation puts banks at risk to runs (e.g., Diamond and Dybvig 1983). On the other hand, financial crises can have effects on liquidity creation (e.g., Dell'Ariccia, Detragiache, and Rajan 2008).

KRS consider bank deposits as exogenous and posit that there may be synergies for banks in fulfilling their two primary roles: accepting deposits and issuing loans. Myers and Rajan (1998), however, show that holding liquid assets is costly. They state that "…increased liquidity can paradoxically be bad. Although more liquid assets increase the ability to raise cash on short notice, they also reduce management's ability to commit credibly to an investment strategy that protects investors (p. 733)." The KRS model supports that as long as the demand for liquidity through transaction deposits in not highly correlated with liquidity demand from loan commitments, a bank can reduce the costs of holding liquid assets to insure provision of liquidity on demand. Gatev, Schuermann, and Strahan (2007b) show that stock-return volatility declines when banks encounter these deposit-loan synergies, and imply that deposit-loan synergies hedge liquidity risk. Observing the relationship between risk and unused commitments for banks with

[1] Off-balance sheet activities: https://www.fdic.gov/regulations/safety/manual/section3-8.pdf

high levels of transactions deposits and for banks with low levels of transactions deposits during the commercial paper crisis of 1998, they conclude that this hedging is more beneficial during crises. They also state that while government safety nets back up banks during crises, the evidence from the KRS model and Gatev, Schuermann, and Strahan (2007a) imply that bank structure matters, too.

This study contributes two empirical findings. We find that the deposit-lending synergies shown to reduce the volatility of banks' stock returns, translate into higher bank profitability only for small publicly traded banks. However, the synergies do not appear to affect the profitability of these publicly traded banks around financial crises.

The next section reviews five major crises that affected the U.S. financial market from 1986 to 2008.[2] Section 3 describes the sample and the main variables. Section 4 presents the empirical tests and reports the results, and Section 5 concludes.

1. The crises

The crises considered in this study include two banking crises (the credit crunch of the early 1990s and the subprime lending crisis that became apparent in 2007) and three market-related crises (the 1987 stock market crash; the Russian debt crisis and the Long-Term Capital Management bailout in 1998; and the bursting of the dot.com bubble in the early 2000s).

On Black Monday, October 19, 1987, the stock market crashed. The S&P500 index dropped about 20.4%. The Dow Jones Industrial Average lost about 22.6% of its value. The crash was preceded by years of dramatic surge of the stock market. Potential causes of the crash include program trading, overvaluation, illiquidity, and market psychology.

Commercial and industrial lending declined in the early years of 1990s. Peek and Rosengren (1995) cite that this credit crunch was due to the fall in bank capital from loan losses

[2] We will extend the study period in the next draft of this manuscript.

of the late 1980s. Bernanke and Lown (1991) review the behavior of bank lending and also claim that reduced loan demand due to macroeconomic and regional recessions caused the crunch. Other authors (e.g., Hancock, Laing and Wilcox 1995 and Thakor 1996) note that the credit crunch was related to the implementation of Basel I capital standards.

Long-Term Capital Management (LCTM), a leading U.S. hedge fund that used an arbitrage strategy referred to as market neutral, nearly collapsed in late 1998. When Russia devaluated its currency and defaulted on its sovereign debt on August 17, 1998, the U.S. stock market dropped by about 20%, while the European markets fell by about 35%. Investors fled to U.S. treasury bonds. As a result, by the end of August 1998, LCTM had lost about 50% of the value of its highly leveraged capital investments. To save the U.S. banking system, the Federal Reserve Bank of New York organized a $3.5 billion bailout by LTCM's major creditors.

During the mid to late 1990s, many internet-based companies were founded. Most of these companies focused on increasing market share. These companies could raise money even if they had not earned substantial profits or revenues. On March 10, 2000, The Nasdaq composite index doubled its value of the year before. Several internet-based companies were acquired or filed for bankruptcy. The U.S. economy started to slow down and the stock market began to fall. Due to this bubble burst and later to the September 11, 2001 attacks, the economic slowdown amplified.

The Federal Reserve intervened in unprecedented ways in response to the subprime lending crisis that became apparent in 2007. Banks had difficulty in selling loans and seemed to be reluctant to provide credit to borrowers or to lend to each other. Risk premia increased. Some banks lost a major part of their capital. The Federal Reserve extended the safety-net to financial

institutions, lowered the discount rate, and started holding mortgage-backed securities and lending directly to investment banks.

2. Sample and variable descriptions

We obtain quarterly data for U.S. commercial banks for the period 1985-Q1 to 2008-Q4 from the Federal Reserve of Chicago Consolidated Report of Condition and Income database (Call Reports).[3] We define the study variables as follows:

Market-level controls

- Federal funds rate (*FedRate*) = Quarterly average of monthly federal funds rate [4]

Economic condition controls

- *NatEmpl* = Annual rate of national employment growth [5]

Bank-level controls

- *Size* = Natural logarithm of total assets in 2008-Q4 dollars using the consumer price index as deflator.
- Liquid asset (*LiqAssets*) = (Cash plus Securities + Fed funds sold) divided by Total assets
- Capital Adequacy (*CapAdeq*) = Total equity capital divided by Total assets
- Access to Federal funds market (*FedPool*)= Fed funds purchased divided by Total assets
- *PubTraded* is a (0, 1) dummy variable with the value of 1 if the bank or its highest parent bank holding company is publicly traded. We distinguish publicly traded banks from non-publicly traded banks as Holod and Peek (2007) posit that non-publicly traded firms are the most likely to face liquidity constraints. We use the CRSP-FRB Link dataset provided by the Federal Reserve Bank (FRB) of New York, which provides a link between regulatory entity

[3] Call reports databases are located on the website of the Federal Reserve Bank of Chicago at http://www.chicagofed.org/.
[4] Monthly federal funds rates are available on the website of the Board of Governors of the Federal Reserve System at http://www.federalreserve.gov
[5] Employment data are from the website of the Bureau of Labor Statistics at http://www.bls.gov

codes and Center for Research in Security Prices (CRSP) permanent company codes for publicly-traded banks and bank holding companies that are listed on the NYSE, AMEX, or NASDAQ.

- *InBHC* is a (0, 1) dummy variable with the value of 1 if the bank is part of a bank holding company and 0 otherwise.
- *Agri*, *Comm*, *Mort*, *Consu*, and *Other* are (0, 1) dummy variables to control for line of business, with the value of 1 if the bank is specialized in agriculture, commercial, mortgage, consumer, or other lending, respectively, and 0 otherwise.
- *Small*, *Medium*, and *Large* are (0, 1) dummy variables with the value of 1 if the bank is considered as small, medium, or large, respectively, and 0 otherwise. Berger, Miller, Petersen, Rajan, and Stein (2005) and KRS document differences between large and small bank portfolios. KRS use three bank size categories: large (top 100 banks based on average of total assets), medium (next 500 banks), and small (the remaining banks). For each quarter, we consider small banks (total assets< $100 Millions), medium banks ($100 Millions≤ total assets ≤ $1 Billion), and large banks (total assets > $1 Billion).

Deposits

- *TransDep* = Transactions deposits divided by Total assets[6]
- *BrokerDep* = Brokered deposits divided by Total assets
- *LargeTimeDep* = Total time deposits of $100,000 or more divided by Total assets

Bank profitability

- Return on Equity (*ROE*) = Net income divided by Total equity capital

[6] As Holod and Peek (2007) suggest, scaling by assets allows a clearer interpretation of relative responses to changes.

Net income and equity reflect the bank's on-balance-sheet and off-balance-sheet activities, thus our choice of *ROE* rather than return on assets (ROA) as the measure of profitability.

Liquidity exposure

- *UnusedLoanCom* = Unused commitments divided by Total assets, where

Unused commitments = Unused (Revolving, open end lines secured by 1-4 residential properties
+ Commercial, real estate, construction, and land development, secured by real estate
+ Commercial, real estate, construction, and land development, not secured by real estate
+ Securities underwriting + Commercial and similar letters of credit)
+ Other unused commitments.

Prior to March 1990, components of unused commitments were not available on the call reports. Therefore, we use the total unused commitments (item RCFD3423) instead for the sub-period 1986-Q1 to 1989-Q4. Following KRS, we omit unused credit card commitments. KRS note that credit card lines do not provide as much liquidity as the other commitments, since most credit cards holders pay their balance monthly, and that only a small number of banks engage in the credit card business. Therefore, we exclude credit card banks, as well as banks with a ratio of credit card loans to total loans greater than 0.5. We also exclude foreign owned banks and banks not located in the 50 States, as well as banks with foreign offices. In addition, we leave out any bank-quarter observation in which a merger occurs, as well as the bank observation in the subsequent quarter. Finally, we eliminate observations with negative equity, observations with negative net income, as well as observations with ROE values that deviate by more than four standard deviations from the mean value of ROE in the quarter. The final sample includes a total of 491,089 observations, with each individual bank being primarily insured by the Federal Deposit Insurance Corporation (FDIC) and having at least four quarters of observations.

[Table 1 about here]

From the summary statistics in Table 1, on average, *ROE* is higher across banks with both high transaction deposits and high unused loan commitments (HH), suggesting that the KRS diversification synergies from combining these two liquidity risks translate into better profitability. The higher profitability shows across the three size categorization for both publicly traded (in Panel A) and non-publicly traded banks (in Panel B).

3. Empirical tests and results

3.1 Empirical tests

First, to examine whether there is a broader benefit from the KRS deposit-lending synergies, we estimate bank profitability as a function of liquidity exposure, transaction deposits ratio and other deposits ratios, as well as market-level, economic conditions, and other bank-level characteristics.

Hypothesis 1: *Deposit-lending synergies translate to increased profitability (ROE).*

(1) ROE of bank *i* in quarter q:

$$\begin{aligned} ROE_{i,q} = \; & \beta_0 + \beta_1 UnusedLoanCom_{i,q-1} + \beta_2 TransDep_{i,q-1} \\ & + \beta_3 LargeTimeDep_{i,q-1} + \beta_4 BrokerDep_{i,q-1} \\ & + \beta_5 (UnusedLoanCom_{i,q-1} \times TransDep_{i,q-1}) \\ & + Market\text{-}level,\ Economic\ conditions,\ and\ Bank\text{-}level\ control\ variables + u_{i,q} \end{aligned}$$

We include four lagged values of the federal funds rate to control for market fluctuations and four lagged values of national employment growth to control for economic conditions. We allow for bank fixed effects to control for omitted bank characteristics. The effect of the deposit-lending synergy is the coefficient of the interaction of unused loan commitments and transaction deposits (β_5). We expect β_5 to be positive. That is the higher the unused loan commitments, the

greater (more positive) the effect of transaction deposits on ROE. Similarly, the higher the transaction deposits, the greater (more positive) the effect of unused commitments on ROE.

Next, to study the effect of transaction deposits and unused loan commitments on profitability during and after each of the five crises observed in this study, we focus on the behavior of individual banks rather than the banking sector as a whole. Hereafter, we limit the sample to the publicly traded banks because our prior analyses show that an increase in deposit-lending synergy translates to an increase in profitability only for these banks.

Hypothesis 2: *Pre-crisis deposit-lending synergies translate to increased profitability during, as well as after a crisis.*

We estimate bank profitability during, as well as after each crisis as a function of pre-crisis liquidity exposure, deposit ratios, and other market-level and bank-level characteristics. We consider the averaged values of these variables over the pre-crisis period (8 or 5 quarters before the crisis), during the crisis, and over the post-crisis period (8 or 5 quarters after the crisis, except for the last crisis).[7] Since we use a cross-sectional model, we do not control for bank and quarter fixed effects.

(2) Profitability of bank *i* around crisis *j*:

$$ROE_{i,j} = \alpha_0 + \alpha_1 AvUnusedLoanCom_{i,j} + \alpha_2 AvTransDep_{i,j} + \alpha_3 AvLargeTimeSavDep_{i,j} + \alpha_4 AvBrokerDep_{i,j} + \alpha_5 (AvUnusedLoanCom_{i,j} \times AvTransDep_{i,j}) + Market\text{-}level,\ Economic\ conditions,\ and\ Bank\text{-}level\ control\ variables + \varepsilon_{i,j}$$

[7] We reduce to 5 quarters the post-crisis period of the Russian debt /LCTM bailout crisis, as well as the pre-crisis period of the bursting of the dot.com bubble crisis to insure that these periods are not contaminated by crisis proximity.

3.2 Results

Gatev, Schuermann, and Strahan (2007b) show that large publicly traded banks experience a reduced liquidity risk when the synergies exist. As shown in Panel A of Table 2, the coefficient on the interaction term (*UnusedLoanCom* × *TransDep)* is positive (0.056) and statistically significant at the 10% level for publicly traded banks and negative (-0.047) and statistically significant at the 1% level for non-publicly traded banks. These results imply that deposit-lending synergies translate to increased profitability only for publicly traded banks. For non-publicly traded banks, on one hand, an increase in either transaction deposits or unused loan commitments (but not both) results in an increase in profitability. Specifically, a 1% point increase in non-publicly traded bank transaction deposits, as percentage of total assets, is associated with an increase of 3% points in *ROE*. Similarly, a 1% point increase in unused loan commitments is associated with an increase of 4.1% points in *ROE*. However, a higher combination of transaction deposits and unused loan commitments has a highly statistically significant (1% level) negative effect on profitability.

[Table 2 about here]

Gatev, Schuermann, and Strahan (2007b) report that loan commitments are related to size. In Panel B of Table 2, a closer look at publicly traded banks reveals that small publicly traded banks are the ones that benefit in term of profitability from the synergies. While the coefficient on the interaction term is positive across the publicly traded banks, the coefficient (0.181) is statistically significant only for small banks. This finding is in tune with small banks being more focused on the traditional banking activities of deposit taking and lending. The negative effect of higher combination of transaction deposits and unused loan commitments on *ROE* is mainly true for non-publicly traded medium and large banks. Being less transparent than

publicly traded banks, non-publicly traded banks may encounter other risks that the deposit-lending synergies cannot hedge, thus relatively affecting negatively their profitability.

As a robustness check, we repeat the previous tests only for "healthy" banks (with capital adequacy of 6% or more) and obtain similar results (not reported). Following Gatev, Schuermann, and Strahan (2007b), we also repeat the analyses without controlling for broker deposits and large time deposits. The evidence that deposit-lending synergies translate to increased profitability only for publicly traded banks still holds as reported in Table 3.

[Table 3 about here]

In addition, we find evidence that holding liquid assets is indeed costly, supporting Myers and Rajan (1998). From Table 3, for healthy banks, a 1% point increase is liquid assets is associated on average with 1.6% point decrease in profitability with 1% level of statistical significance. It is also worth noting that from all our previous tests, on average, capital adequacy has a highly statistically significant negative effect on profitability.

Figure 1 represents the fluctuations of transaction deposits and unused loan commitments for publicly traded banks around each of the five crises. Before the stock market crash of 1987 (Crisis 1), both transaction deposits and unused loan commitments tend to grow. Afterwards, while unused loan commitment levels continue to rise, there is a continuous perceivable decline in transaction deposit levels. However, each of the three market crises (Crisis 1, 3, and 4) displays some surge in transaction deposits, probably illustrating a "flight to quality". Banking crises are marked by a stagnant level (Crisis 2) or a severe decline (Crisis 5) of unused loan commitments, supporting the idea that these crises are related to lending issues.

[Figure 1 about here]

The results from Table 4 do not show evidence on whether any increase of pre-crisis deposit-lending synergies translate to increased profitability either during or after a crisis. The coefficients on the interaction (*Average TransDep* × *Average UnusedLoanCom)* though positive across the panels are not statistically significant at the conventional levels. The exception is for the bursting of the dot.com bubble followed by the September 11, 2001 attacks (Crisis 4; Panel D of Table 4). On average, for publicly traded banks, either a higher level of transaction deposits or a higher level of unused loan commitments (not both) before Crisis 4 translates into a statistically significant increase in profitability during the crisis. However, the statistically significant negative coefficient (-0.245) on the interaction variable implies that a higher combination of both liquidity risks has a negative effect on profitability during that crisis.

[Table 4 about here]

4. Conclusion

The main contribution of this study is to further examine another potential value of the KRS deposit-lending synergies model. Gatev, Schuermann, and Strahan (2007b) show that large publicly traded banks experience a reduced liquidity risk when the synergies exist. We investigate how these synergies reflect on bank profitability. First, we find that the deposit-lending synergies translate into increased profitability measured by *ROE*, only for publicly traded banks, specifically the smaller ones. For the less transparent non-publicly traded banks, highly combining these two liquidity risks has a negative effect on profitability. Second, we analyze the effect of the synergies on bank profitability at the individual publicly traded bank level. We do not find significant evidence on whether the banks benefit in term of profitability from the synergies during or after the crises considered in this study. However, on average, a 1% point increase in the interaction of transaction deposits with

unused loan commitments before the bursting of the dot.com bubble followed by the 2001 attacks is related to about 25% point decrease on profitability during the crisis.

In sum, the combination of high transaction deposits and unused loan commitments appear to have a positive role in the management of small publicly traded banks. However, such synergies cannot help banks to weather financial crises.

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Table 1: Summary statistics of selected variables of publicly traded and non-publicly traded banks (1985-Q1 to 2008-Q4)

Mean values in % of total assets (except for ROE). Banks are categorized into three groups: Small (total assets< $100 Million), Medium ($100 Million ≤ total assets ≤ $1 Billion), and Large (total assets > $1 Billion).
A high transaction deposit (unused loan commitment) bank has transaction deposit (unused loan commitment) value at or above the variable median of each year.
HH = High Transaction Deposits and High Unused Loan Commitments; HL = High Transaction Deposits and Low Unused Loan Commitments; LH = Low Transaction Deposits and High Unused Loan Commitments; LL = Low Transaction Deposits and Low Unused Loan Commitments

Panel A – Publicly traded banks

	Small				Medium				Large			
Number of observations:	3,552				17,385				5,387			
	HH	HL	LH	LL	HH	HL	LH	LL	HH	HL	LH	LL
ROE	7.47	7.04	6.45	5.98	8.70	7.73	8.15	7.06	9.43	9.52	8.75	8.39
TransDep	30.50	33.71	17.28	12.82	29.22	29.01	15.15	13.31	29.42	30.30	11.15	6.35
BrokerDep	1.49	0.23	2.77	1.06	0.60	0.41	2.34	1.72	0.33	0.12	3.34	4.46
LargeTimeDep	12.73	8.19	16.73	12.18	10.81	11.28	13.75	14.32	9.12	7.28	12.31	11.17
LiqAssets	33.10	46.28	30.02	49.20	32.88	38.42	27.27	34.31	37.19	26.60	26.55	26.91
UnusedLoanCom	12.56	2.75	10.02	1.18	13.03	4.49	14.14	4.22	15.19	4.92	18.02	4.26
FedPool	0.96	0.48	1.47	0.75	2.06	0.92	2.05	1.98	4.46	1.64	3.53	7.68

Panel B – Non-publicly traded banks

	Small				Medium				Large			
Number of observations:	329,486				131,810				3,469			
	HH	HL	LH	LL	HH	HL	LH	LL	HH	HL	LH	LL
ROE	7.59	7.10	7.03	6.79	8.42	7.71	7.84	7.46	9.78	7.53	8.49	7.90
TransDep	30.37	31.21	18.03	18.06	29.99	30.19	15.56	15.93	28.47	27.73	9.86	7.43
BrokerDep	0.25	0.31	0.76	0.65	0.69	0.43	2.96	1.90	0.99	1.31	3.31	8.87
LargeTimeDep	9.23	9.43	10.44	10.80	11.29	12.69	14.18	14.87	10.20	12.53	13.88	16.36
LiqAssets	41.83	46.53	39.61	43.06	33.20	40.21	28.01	36.37	38.27	53.86	26.08	37.31
UnusedLoanCom	7.46	2.48	6.80	2.22	12.32	4.32	12.77	4.09	14.84	4.26	18.59	4.39
FedPool	0.71	0.40	0.78	0.60	1.40	0.66	1.53	0.74	7.15	5.36	3.03	8.29

Table 2: Regressions of bank profitability (ROE) on previous quarter liquidity exposure and transaction deposits ratio

We control for market-level, economic conditions, bank-level variables, and quarter dummies (1986q1-2008q4). The *p*-values (in parentheses) are based on heteroskedasticity-robust standard errors. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively.

Panel A

	All Banks	Publicly Traded	Non-Publicly Traded
Number of observations	427,696	21,524	406,112
Adj. R^2	0.6891	0.7649	0.6924
TransDep	0.027***	-0.008	0.030***
	(0.000)	(0.125)	(0.000)
UnusedLoanCom	0.041***	0.014	0.041***
	(0.000)	(0.070)	(0.000)
TransDep × UnusedLoanCom	-0.044***	0.056*	-0.047***
	(0.000)	(0.030)	(0.000)
BrokerDep	0.000	-0.033***	0.001
	(0.519)	(0.000)	(0.475)
LargeTimeDep	-0.017***	-0.008	-0.017***
	(0.000)	(0.094)	(0.000)
LiqAssets	-0.015***	-0.014***	-0.016***
	(0.000)	(0.000)	(0.000)
CapAdeq	-0.275***	-0.179***	-0.296***
	(0.000)	(0.000)	(0.000)
FedPool	0.001	0.017*	0.001
	(0.637)	(0.011)	(0.751)
Size	0.003***	-0.002***	0.003***
	(0.000)	(0.001)	(0.000)
InBHC	-0.001***	0.010***	-0.001***
	(0.000)	(0.000)	(0.000)
Sum FedRate (4 lags)	-0.001***	-0.008***	-0.001***
	(0.000)	(0.000)	(0.000)
Sum NatEmpl (4 lags)	0.012***	-0.053***	-0.054***
	(0.000)	(0.000)	(0.000)
Line of business	Yes	Yes	Yes
Quarter Dummies	Yes	Yes	Yes

Panel B

	Publicly Traded			Non-Publicly Traded		
	Small	Medium	Large	Small	Medium	Large
Number of observations	2,657	15,153	3,774	5,297	119,269	2,790
Adj. R^2	0.7804	0.7961	0.7927	0.6835	0.7652	0.8287
TransDep	-0.031	-0.004	0.008	0.051***	0.014***	0.080***
	(0.070)	(0.498)	(0.647)	(0.000)	(0.000)	(0.000)
UnusedLoanCom	-0.028	0.027**	0.028	0.035***	0.038***	0.053**
	(0.309)	(0.006)	(0.083)	(0.000)	(0.000)	(0.002)
TransDep × UnusedLoanCom	0.181*	0.018	0.038	-0.011	-0.050***	-0.252*
	(0.043)	(0.578)	(0.579)	(0.364)	(0.000)	(0.021)
BrokerDep	0.008	-0.059***	-0.116***	0.000	-0.003	-0.037
	(0.633)	(0.000)	(0.000)	(0.708)	(0.459)	(0.118)
LargeTimeDep	0.002	-0.015*	0.037**	0.001	-0.035***	0.027*
	(0.866)	(0.015)	(0.005)	(0.691)	(0.000)	(0.016)
LiqAssets	-0.008	-0.017***	0.010	-0.019***	-0.017***	0.026*
	(0.469)	(0.000)	(0.352)	(0.000)	(0.000)	(0.015)
CapAdeq	-0.105***	-0.198***	-0.291**	-0.279***	-0.365***	-0.175***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)
FedPool	0.007	0.007	0.015	0.012*	0.000	-0.061***
	(0.841)	(0.385)	(0.320)	(0.012)	(0.935)	(0.000)
Size	0.015**	-0.004***	-0.007*	0.004***	0.002***	-0.019***
	(0.001)	(0.000)	(0.036)	(0.000)	(0.001)	(0.000)
InBHC	0.047***	0.014***	0.007	-0.000	-0.001**	-0.021
	(0.000)	(0.000)	(0.331)	(0.067)	(0.001)	(0.071)
Sum FedRate (4 lags)	-0.010	-0.011***	-0.011***	-0.002***	-0.024***	-0.012***
	(0.511)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sum NatEmpl (4 lags)	-0.034***	-0.036***	-0.042***	-0.028***	-0.041***	-0.058***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Line of business	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Dummies	Yes	Yes	Yes	Yes	Yes	Yes

Table 3: Regressions of bank profitability (ROE) on previous quarter liquidity exposure and transaction deposits ratio (no control for broker deposits and large time deposits)

The *p*-values (in parentheses) are based on heteroskedasticity-robust standard errors. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively.

	All Banks	Publicly Traded	Non-Publicly Traded
Number of observations	427,696	21,524	406,112
Adj. R^2	0.6889	0.7645	0.6875
TransDep	0.030***	-0.007	0.033***
	(0.000)	(0.169)	0.000)
UnusedLoanCom	0.040***	0.013	0.041***
	(0.000)	(0.095)	(0.000)
TransDep × UnusedLoanCom	-0.048***	0.059*	-0.051***
	(0.000)	(0.022)	(0.000)
LiqAssets	-0.016***	-0.011***	-0.017***
	(0.000)	(0.000)	(0.000)
CapAdeq	-0.275***	-0.178***	-0.294***
	(0.000)	(0.000)	(0.000)
FedPool	0.003	0.020**	0.002
	(0.273)	(0.003)	(0.350)
Size	0.003***	-0.003***	0.003***
	(0.000)	(0.001)	(0.000)
InBHC	-0.001**	0.010***	-0.001***
	(0.003)	(0.000)	(0.001)
Sum FedRate (4 lags)	0.008***	-0.039***	-0.001***
	(0.000)	(0.000)	(0.000)
Sum NatEmpl (4 lags)	-0.037***	-0.053***	-0.055***
	(0.000)	(0.000)	(0.000)
Line of business	Yes	Yes	Yes
Quarter Dummies	Yes	Yes	Yes

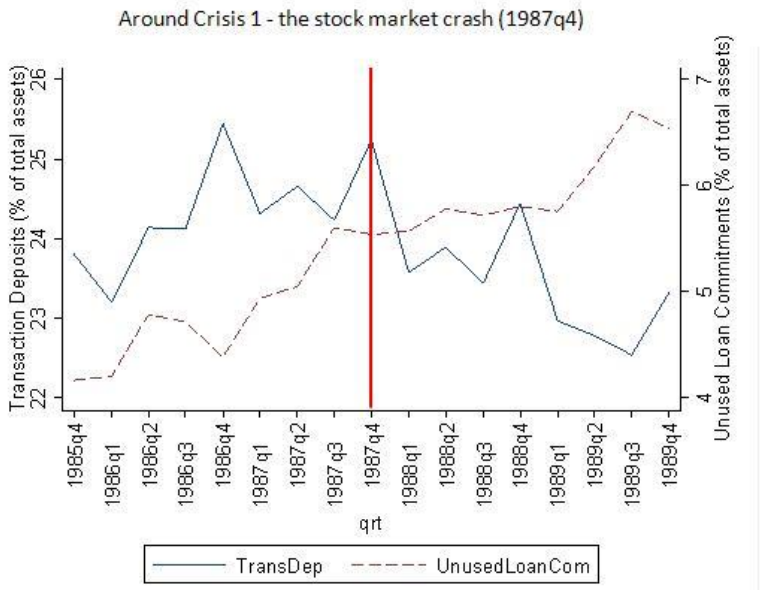
Table 4: Cross-sectional regressions of bank profitability (ROE) during and after crises on pre-crisis averages of liquidity exposure and transaction deposits ratio

We include market-level, economic conditions, and bank-level controls in all regressions. The *p*-values (in parentheses) are based on heteroskedasticity-robust standard errors. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively.

	Stock market crash (1987q4)		Credit crunch (1990q1-1992q4)		Russian debt and LTCM bailout (1998q3-1998q4)		Bursting of the dot.com bubble and September 11 attacks (2000q2-2002q2)		Subprime lending crisis (apparent from 2007q3)
Number of observations (individual banks)	154		177		268		319		486
	During Crisis	After Crisis	During Crisis	After Crisis	During Crisis	After Crisis	During Crisis	After Crisis	2007q3-2008q4
R-squared	0.1572	0.2012	0.2249	0.1398	0.2519	0.1971	0.2061	0.1097	0.1473
Average TransDep	0.117	0.097*	-0.009	0.008	0.067	0.023	0.088***	0.047	-0.015
	(0.085)	(0.014)	(0.869)	(0.881)	(0.096)	(0.475)	(0.001)	(0.088)	(0.712)
Average UnusedLoanCom	0.062	0.130	-0.078	-0.132	-0.088	-0.018	0.075*	-0.031	-0.024
	(0.724)	(0.223)	(0.630)	(0.341)	(0.246)	(0.743)	(0.027)	(0.501)	(0.471)
Average TransDep × Average UnusedLoanCom	-0.441	-0.519	0.083	0.202	0.285	0.043	-0.245*	0.114	0.036
	(0.382)	(0.103)	(0.892)	(0.718)	(0.139)	(0.762)	(0.014)	(0.410)	(0.856)
Average BrokerDep	0.848	-0.817	-0.525**	-0.272	0.218*	0.068	-0.017	-0.037	-0.002
	(0.253)	(0.106)	(0.001)	(0.087)	(0.050)	(0.326)	(0.674)	(0.286)	(0.938)
Average LargeTimeDep	-0.069	0.027	-0.006	0.006	-0.015	-0.007	-0.013	-0.009	-0.077***
	(0.207)	(0.347)	(0.815)	(0.782)	(0.713)	(0.813)	(0.557)	(0.728)	(0.000)
Average LiqAssets	0.004	-0.041	0.025	0.013	-0.048*	-0.013	-0.002	-0.013	0.026
	(0.921)	(0.106)	(0.177)	(0.472)	(0.026)	(0.397)	(0.890)	(0.408)	(0.083)
Average CapAdeq	-0.316**	-0.230***	-0.383**	-0.286*	-0.257*	-0.167	-0.337***	-0.196*	-0.070
	(0.002)	(0.000)	(0.005)	(0.015)	(0.022)	(0.081)	(0.000)	(0.017)	(0.250)
Average FedPool	-0.211	-0.182*	-0.152	0.005	-0.014	-0.055	-0.009	0.034	0.117**
	(0.076)	(0.022)	(0.061)	(0.948)	(0.824)	(0.233)	(0.761)	(0.342)	(0.001)
Average Size	0.009*	0.005*	0.003	0.003	0.010***	0.010***	0.008***	0.007***	-0.000
	(0.043)	(0.033)	(0.158)	(0.217)	(0.000)	(0.000)	(0.000)	(0.000)	(0.957)
Average FedRate	0.001	0.024	-0.051*	-0.005	-0.272*	-0.103	-0.003	0.007	-0.013
	(0.973)	(0.220)	(0.016)	(0.769)	(0.037)	(0.357)	(0.906)	(0.797)	(0.267)
Average NatEmpl	-0.122	-0.078	0.194	-0.027	l 0.013	0.068	-0.012	0.002	0.117*
	(0.146)	(0.163)	(0.127)	(0.740)	(0.876)	(0.314)	(0.486)	(0.925)	(0.011)

Figure 1- Fluctuations of transaction deposits and unused loan commitments of publicly traded banks

Panel A



Panel B

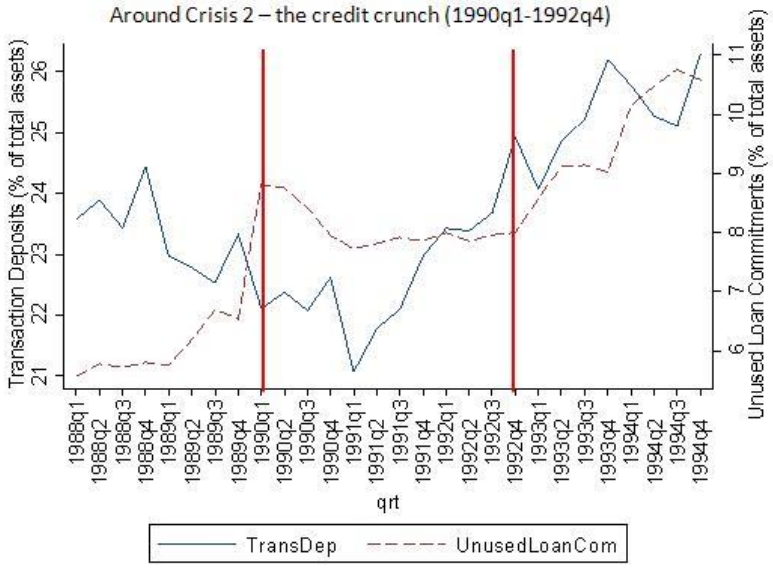
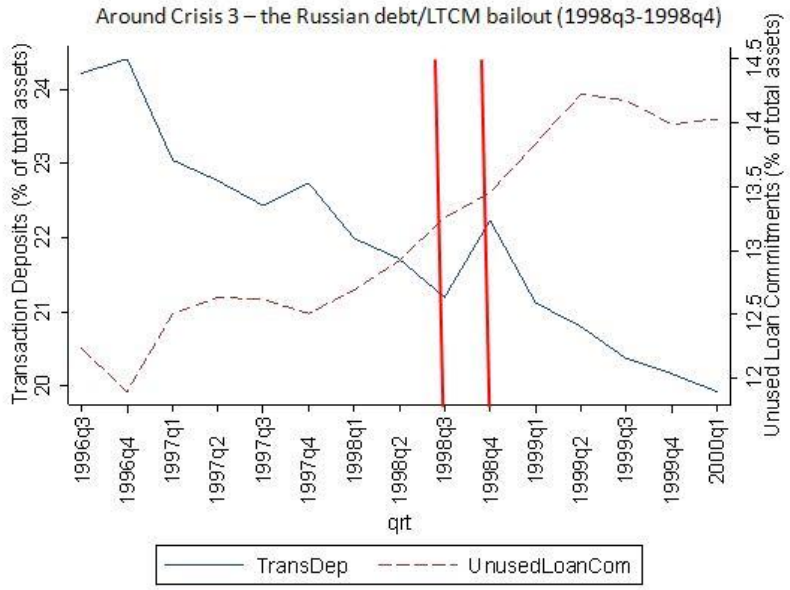


Figure 1(continued)

Panel C



Panel D

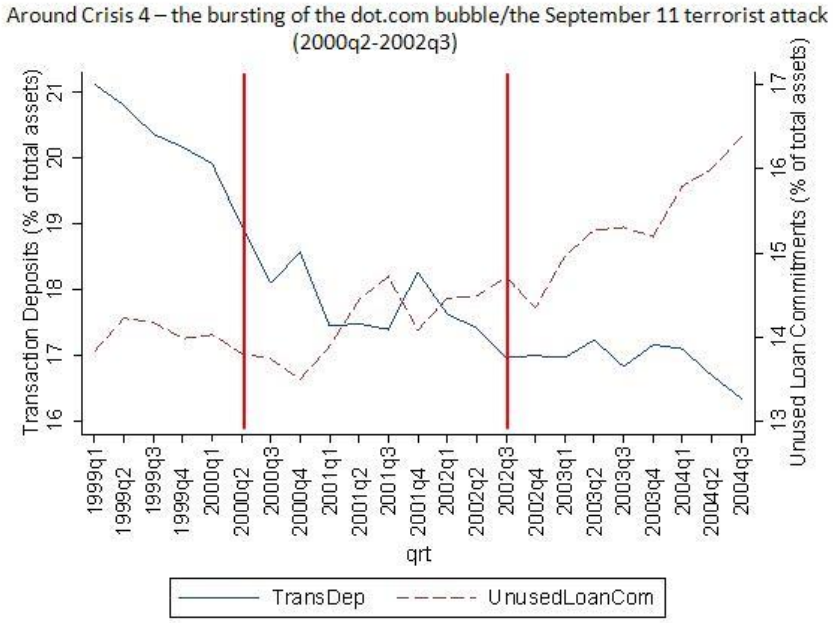


Figure 1(continued)

Panel E