Liquidity Dependence and the Waxing and Waning of Central Bank Balance Sheets

First Draft: August 2022

This Draft: March 2023

ONLINE APPENDIX

Viral V Acharya
(NYU Stern School of Business, CEPR, ECGI & NBER)

Rahul S Chauhan
(University of Chicago Booth School of Business)

Raghuram Rajan
(University of Chicago Booth School of Business and NBER)

Sascha Steffen
(Frankfurt School of Finance & Management)

Table of Contents

#	Description	Page
Appendix A		
Figures		
A1	Decomposition of Deposits	1
A2	Uninsured Claims to Potential Liquidity Ratio (Credit Lines + Uninsured Demand and Savings Deposits to Reserves + Eligible Assets)	2
A3	CD spread with Savings, Interest Checking and Money Market Rates	4
A4	CD Rate – Money Market Savings Rate Spread by Maturity	5
A5	Stock Returns against Claims to Liquidity Ratio	6
Tables		
A1	Summary Statistics	7
A2	Deposits on Reserves and Household Financial Assets net of Deposits	10
A3	Table 2 Restricted to 2009 Q3 – 2019 Q2	11
A4	Effect of Reserves on Deposit Quantities - First Stage (Bank-level)	12
A5	Effect of Reserves on Credit Line Originations - First Stage (BHC-level)	13
A6	Effect of Reserves and Deposits on Deposit Rate Spreads: 1st Stage	14
A7	Effect of Reserves on Credit Line Originations – Controlling for firm-demand	15
A8	Deposit Rate Spreads - OLS Regressions	16
A9	Second Stage Results with CD – Non-Money Market Savings Rate Spreads	18
A10	Heterogeneity by Bank-HHI and Equity/Assets Ratio for 12-,18- and 24-month CD – money market rates	20
A11	Loan Quantities - Impact due to Exogenous Increase in Bank Reserves	24
A12	Control Variables and Additional Data Description	25
Appendix B: Alternative Instruments		
B1	Alternative Reserves Instrument 1	26
B2	Alternative Reserves Insturment 2	33
B3	Alternative Deposit Instrument 1	39
B4	Alternative Deposit Instrument 2	42

Appendix A

Figure A1. Decomposition of Deposits

This figure plots the share of total time deposits (of all sizes), money market deposit accounts (MMDA), non-MMDA savings accounts and total demand deposit accounts in total domestic deposits from Call Reports data schedule RC-E. The deposit shares are value-weighted at the quarterly level. The vertical lines correspond to the beginning of the different Federal Reserve QE / QT phases: (1) Nov 2008 (QE I), (2) Nov 2010 (QE II), (3) Nov 2012 (QE III), (4) Oct 2014 (Post-QE III), (5) QT period, (6) Sept 2019 (Pandemic QE).

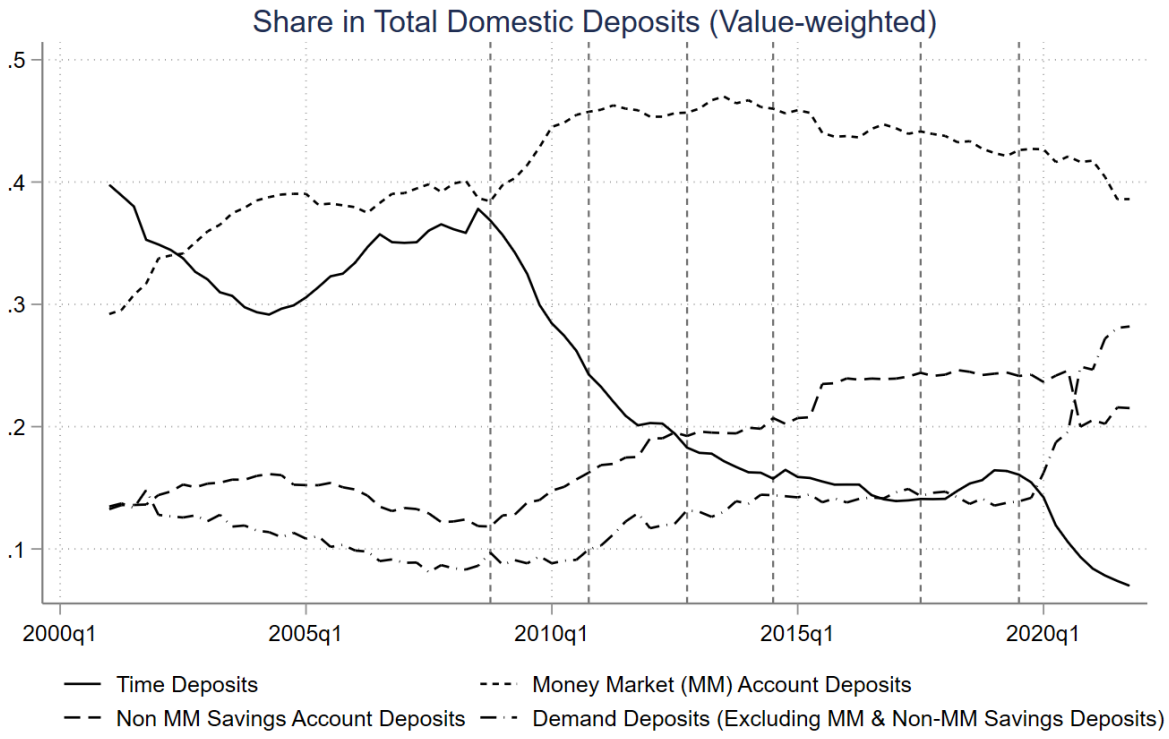
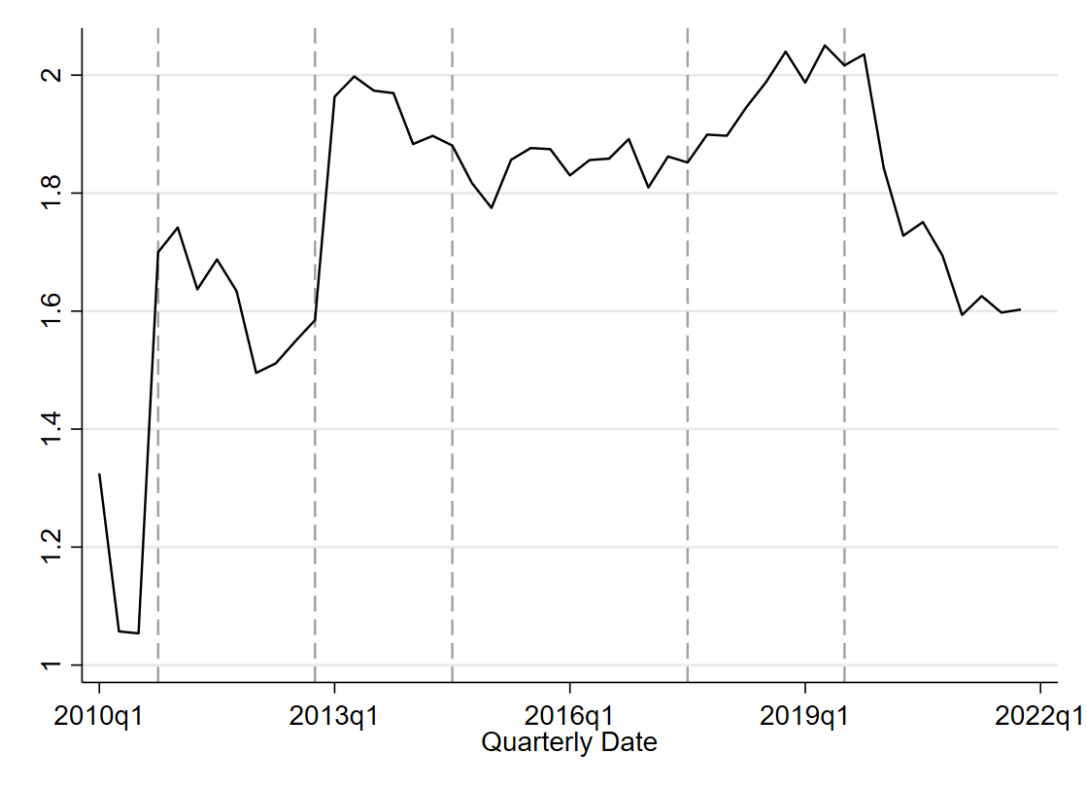


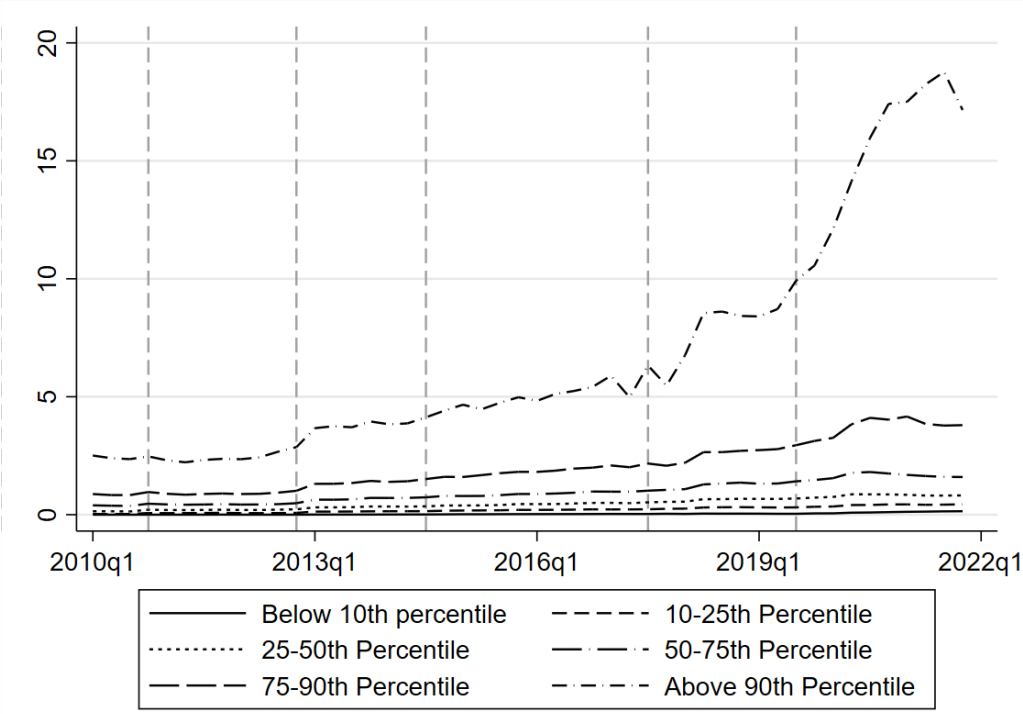
Figure A2: Uninsured Claims to Potential Liquidity Ratio: Credit Lines + Uninsured Demandable Deposits to Reserves + Eligible Assets

This figure plots the time-series of aggregate uninsured demand and savings deposits to reserves and eligible assets ratio as well as its within-sample distribution across bank holding companies over time. Estimation of Insured and Uninsured Domestic Deposits is based on the items in the call report schedule RC-O. Insured deposits are defined as deposits lying below the FDIC deposit insurance thresholds of $100,000 before 2008Q4 and $250,000 after 2008Q4. Uninsured deposits are domestic deposits above the aforementioned deposit insurance thresholds and all foreign deposits. Insured deposits are adjusted for the FDIC Transaction Account Guarantee (TAG) program. The split of Time Deposits into Insured vs. Uninsured Deposits is based on splits of Time Deposits by the aforementioned deposit insurance thresholds in schedule RC-E. Non-time Insured and Uninsured deposits are estimated by taking the difference between Total Insured/Uninsured Deposits and Insured/Uninsured Time Deposits respectively. Non-time Deposits are labelled as Demand + Savings Deposits. Credit Lines refer to Off-Balance Sheet Unused Loans, which is item RCFDJ45 in FDIC's Call Reports. The denominator refers to the sum of Reserves (RCFD0090) and assets that were eligible at any point for quantitative easing transactions from Schedule RC-B of Call Reports (labelled as Eligible Assets for brevity) which is the sum of the banks' holdings of US treasuries, obligations of US Government agencies, securities issued by US States and Political Subdivisions, and agency-backed mortgage-backed securities. Panel A shows the aggregate trends. Panel B plots the within-sample and by-time 10th, 25th, 50th, 75th and 90th percentiles of the demand and savings deposits to reserves and eligible assets ratio. Panel C plots the histogram of the distribution of the ratio by different QE periods. QEI-III refers to the period 2008Q4-2014Q3, Post QE-III period refers to 2014Q4-2017Q3 and the QT period refers to 2017Q4-2019Q3. All data is sourced from FDIC's Call Reports and aggregated at the bank holding company level. The vertical lines correspond to the beginning of the different Federal Reserve QE / QT phases: (1) Nov 2008 (QE I), (2) Nov 2010 (QE II), (3) Nov 2012 (QE III), (4) Oct 2014 (Post-QE III), (5) QT period, (6) Sept 2019 (Pandemic QE).

Panel A: Aggregate Trends



Panel B: Distribution in Percentiles



Panel C: Histogram

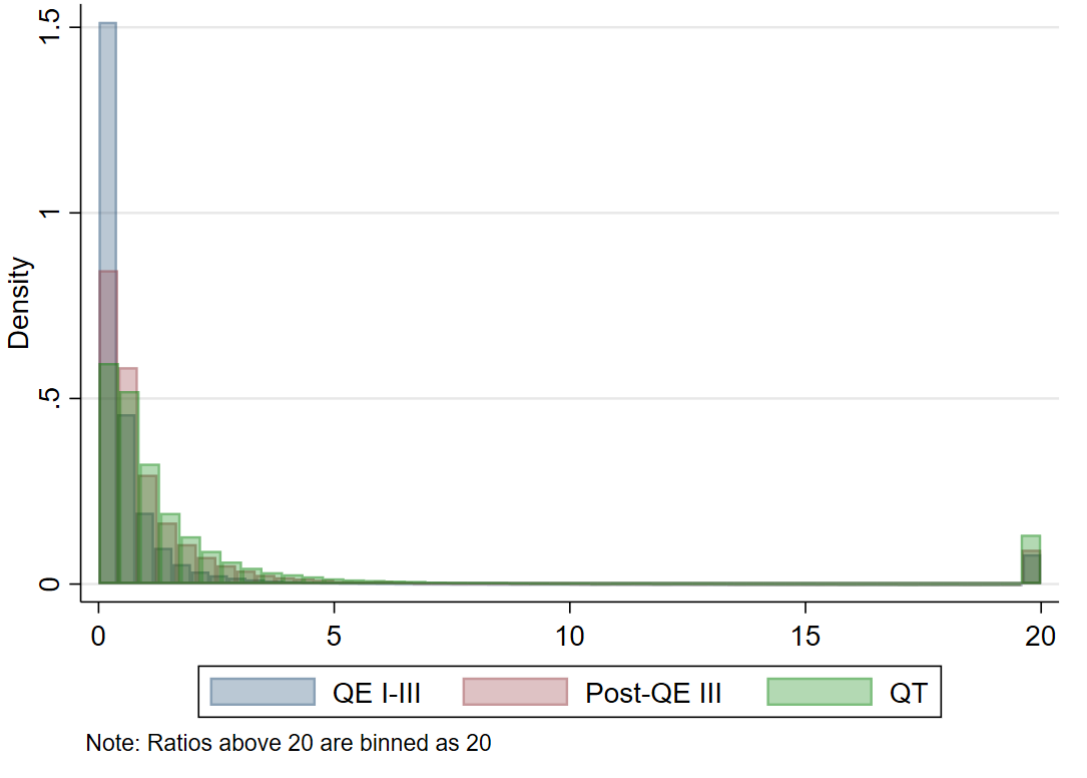


Figure A3: CD spread with Savings, Interest Checking and Money Market Rates

This figure plots the aggregate spread of average bank-level Certificate of Deposit (CD) rates w.r.t. money market account rate, savings account rate and checking account rate respectively at the bank level weighted by bank-quarter level deposits. Bank-quarter level CD rates, money market rates, checking and savings rates are sourced from S&P Global's *RateWatch* deposits dataset. The Effective Federal Funds Rate (EFFR), Target Federal Funds Rate (TFFR) and Interest on Reserves (IOR) are sourced from FRED. The vertical lines correspond to the beginning of the different Federal Reserve QE / QT phases: (1) Nov 2008 (QE I), (2) Nov 2010 (QE II), (3) Nov 2012 (QE III), (4) Oct 2014 (Post-QE III), (5) QT period, (6) Sept 2019 (Pandemic QE).

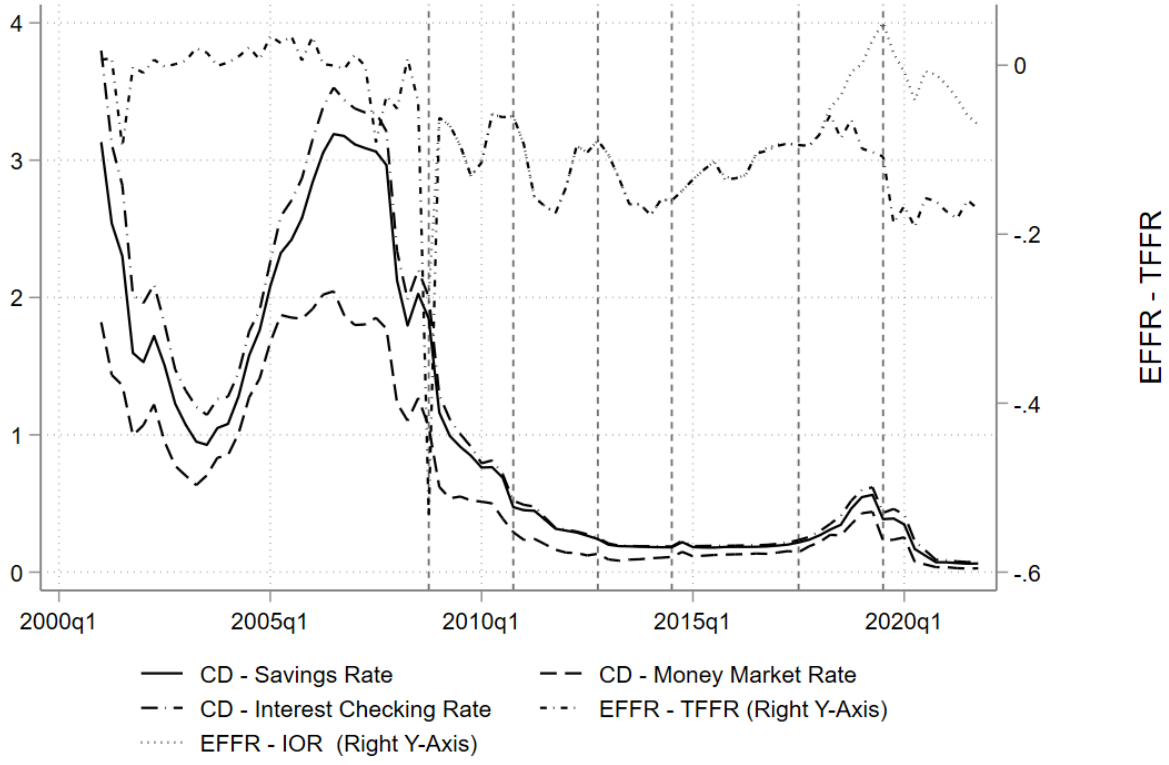


Figure A4. CD Rate – Money Market Savings Rate Spread by Maturity

This figure plots the aggregate spread of CD rates of 3, 12, 18 and 24-month maturities w.r.t. savings rate at the bank level weighted by bank-quarter level deposits. All CD rates and Money Market savings rates are sourced from S&P Global's *RateWatch* deposits dataset. The Effective Federal Funds Rate (EFFR), Target Federal Funds Rate (TFFR) and Interest on Reserves (IOR) are sourced from FRED. The vertical lines correspond to the beginning of the different Federal Reserve QE / QT phases: (1) Nov 2008 (QE I), (2) Nov 2010 (QE II), (3) Nov 2012 (QE III), (4) Oct 2014 (Post-QE III), (5) QT period, (6) Sept 2019 (Pandemic QE).

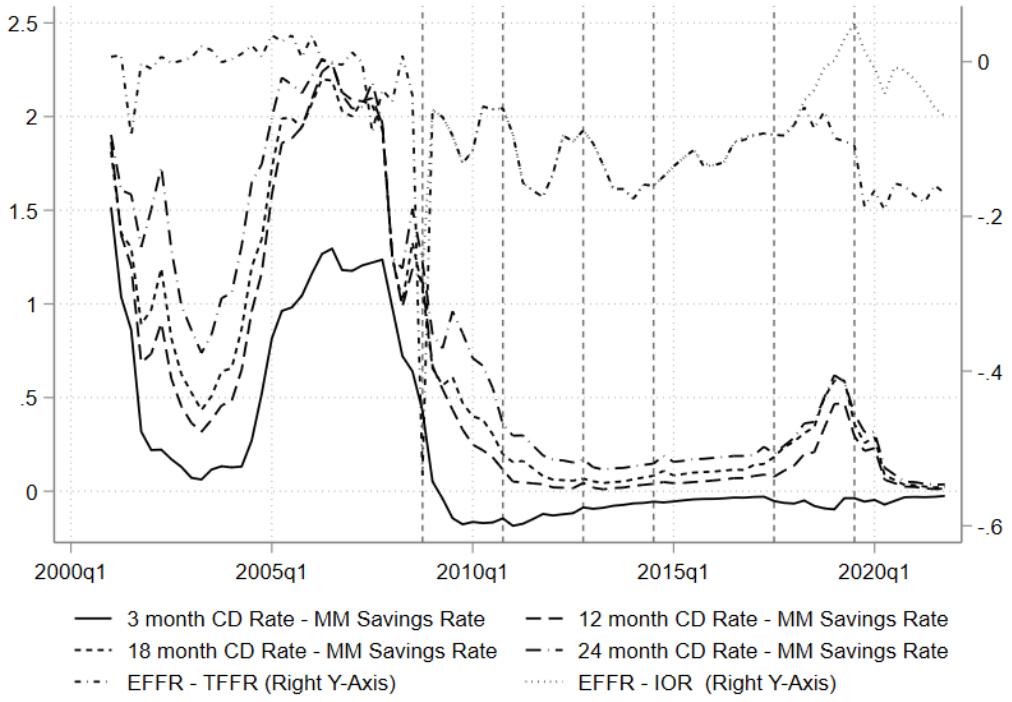
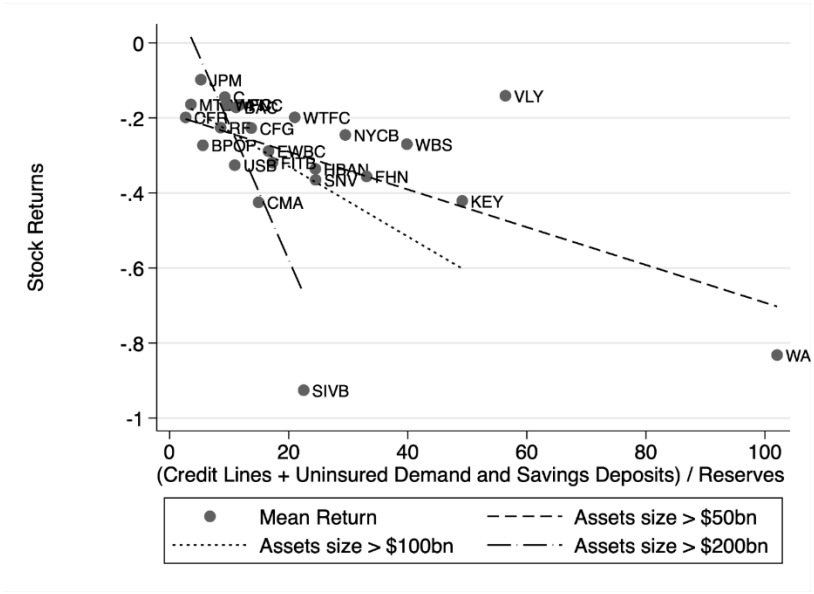


Figure A5: Stock Returns against Claims to Liquidity Ratios

The figure below plots the correlation of bank-level stock returns for the period March 8th to March 17th 2023 against the (Credit Lines + Uninsured Demandable Deposits)/Reserves in 2022Q4 in Panel A and Uninsured Demandable Deposits in Panel B. We plot three different linear fit liens for asset sizes greater than $50 billion, $100 billion and $200 billion

Panel A



Panel B

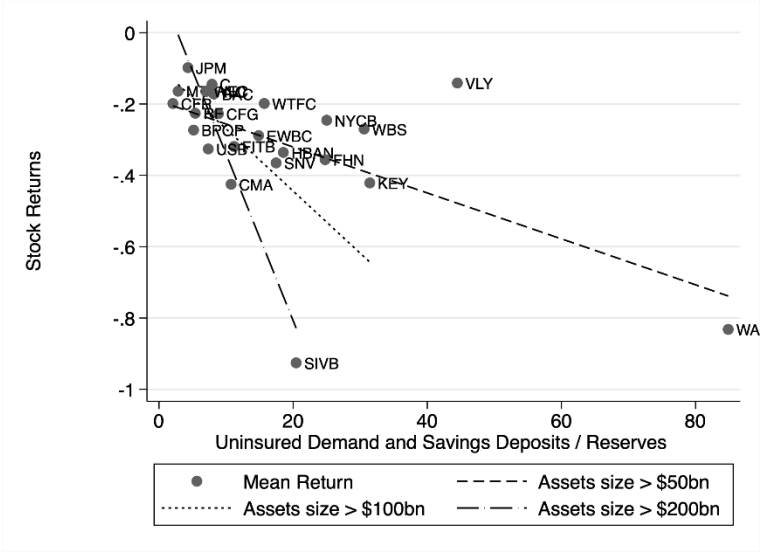


Table A1.1: Summary Statistics

This table shows descriptive statistics for our time-series variables. Demand deposits is the sum of demand and other liquid deposits from the H.6 release. Time deposits is the sum of small- and large-time deposits (H6 and H8 release). All changes are calculated over a 12-month period. Δ Ln(Reserves) is the 12-month Δ the natural logarithm of reserves, and $Ln(Reserves)_{t-12}$ is the 12-month lag of Ln(Reserves). Δ Reserves is the 12-month Δ the level of reserves and $Reserves_{t-12}$ is the corresponding 12-month lagged variable. EFFR-IOR is the Effective Federal Fund Rate (EFFR) minus Interest on Reserves (IOR) on reserves, deposits and credit lines. Ln(Reserves) is the natural logarithm of reserves from the H.6 release, and Ln(Demand Deposits) is the natural logarithm of the sum of demand and other liquid deposits from the H.6 release. Ln(Time Deposits) is the sum of small and large time deposits (H6 and H8 release). Ln(Credit Lines) is the natural logarithm of unused (other) loan commitments from FDIC-insured banks (including corporate credit lines but not credit card commitments). Ln(Usage) is the natural logarithm of quarterly drawn credit lines of U.S. publicly listed firms sourced from Capital IQ.

Panel A: Time Series

	Mean	Median	SD	Min	Max	N
Δ Ln(Deposits)	.0693	.06	.0416	.0224	.203	147
Δ Ln(Demand Deposits)	.0999	.0811	.0616	.0121	.288	147
Δ Ln(Time Deposits)	-.058	-.059	.114	-.337	.162	147
Δ Ln(Credit Lines)	.0563	.0716	.0623	-.118	.214	147
Δ Ln(Reserves)	.135	.0433	.277	-.297	1.21	147
$Ln(Reserves)_{t-12}$	7.5	7.59	.4	5.75	8.08	147
Δ Deposits	803	570	677	170	3023	147
Δ Demand Deposits	995	684	906	136	4050	147
Δ Time Deposits	-136	-127	251	-700	358	147
Δ Credit Lines	159	182	170	-238	731	147
Δ Reserves	254	85.2	564	-592	1641	147
EFFR-IOR	-.0882	-.0943	.0575	-.183	.0725	155
Ln(Reserves)	7.58	7.65	.394	6.55	8.34	155
Ln(Deposits)	9.27	9.28	.241	8.89	9.79	155
Ln(Demand Deposits)	9.14	9.17	.324	8.51	9.81	155
Ln(Time Deposits)	7.71	7.69	.167	7.34	8.12	155
Ln(Credit Lines	7.86	7.9	.227	7.53	8.29	155
Ln(Usage)	20.6	20.5	.464	19.6	21.5	155

Panel B: Bank-level Variables

The table shows summary statistics of bank-level variables constructed from Call Reports and S&P Global's *RateWatch* database. Total Deposits is the sum of Total Domestic and Foreign Deposits held at the depository level (RCON2200+RCFN2200 of Call Reports). Reserves are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090 of Call Reports). ΔLn(Reserves) and ΔLn(Deposits) are the year-on-year change of quarterly levels. 3-, 12- 18- and 24-month Certificate of Deposits (CD) spreads w.r.t Money Market (MM) Savings Deposit Rates are calculated at the bank-quarter level from S&P Global's *RateWatch data.* The reserve instrument i.e. Growth in Aggregate Reserves is the quarter-on-quarter growth in the Reserve Balances of the Federal Reserve Bank. Reserve Share is the ratio of bank-level Reserves to Aggregate Reserves. The County Deposit Growth Instrument is the log of the ratio of contemporary to one-quarter lagged level of total county deposits summed across all the counties the bank has a presence. $\Delta Y_{it}=Y_{it}-Y_{it-4}$.

	Mean	Median	SD	Min	Max	N
Ln(Total Deposits)	13.5	13.2	1.35	0	21.7	138492
Ln(Reserves)	8.83	9.05	2.66	0	20.1	138691
ΔLn(Reserves)	.214	.0898	1.57	-10.5	13.3	121831
ΔLn(Deposits)	.0814	.0551	.231	-10.4	9.84	132449
Ln(Demand + Savings Deposits)	12.9	12.6	1.52	0	21.4	138322
Ln(Time Deposits)	12.3	12.2	1.27	2.94	19.4	137383
ΔLn(Demand + Savings Deposits)	.112	.083	.28	-11.4	10.7	132259
ΔLn(Time Deposits)	.0246	-.00461	.308	-10.1	8.71	131319
Equity Capital/Assets	.107	.0994	.0524	-2.15	.996	138691
Total Assets (1000s)	7617230	657089	7.41e+07	107	3.31e+09	138691
Net Income/Assets	.00172	.00237	.137	-50.8	.87	138610
3-month CD Rate – MM Savings Rate	.204	.00923	.629	-2.99	4.65	93401
12-month CD Rate - MM Savings Rate	.661	.344	.803	-2.21	4.79	99742
18-month CD Rate - MM Savings Rate	.758	.458	.799	-1.64	4.87	83481
24-month CD Rate - MM Savings Rate	.914	.646	.805	-1.64	5	98156
Growth in Agg Reserves (q-o-q) X Average Past 4Q Reserve Share	.0000312	1.05e-08	.00224	-.0108	.447	122471
County Deposit Growth Instrument	.113	.0545	.343	-4.96	5.93	137884

Panel C: Credit Lines Quantities

Bank Balance Sheet Data is sourced from Consolidated Reports of Condition and Income for a Bank with Domestic and Foreign Offices (Call Reports) of the FDIC. *Reserves* are cash and balances from Federal Reserve Banks at the consolidated bank-level (RCFD0090). *Credit lines* are credit line originations from the Refinitiv *LoanConnector* database. Δ*Ln(Credit Lines)* is the Δ the amount of originated credit lines of investment-grade and unrated firms in the U.S. z_{it}^{R} is defined as *Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over past four quarters. Aggregate Reserves* are sourced from *FRED*.

	Mean	Median	SD	Min	Max	N
Δ Ln(Reserves)	.233	.0778	1.34	-9.61	8.94	2353
z_{it}^{R}	.00109	3.03e-07	.016	-.0115	.481	2582
$\text{Ln(Reserves)}_{t-5}$	13.4	13.2	2.68	1.79	20	2336
ΔLn(Credit Lines)	.106	.0617	.862	-4.98	5.78	2828
$\text{Ln(Reserves)}_{t-5}$	13.4	13.2	2.68	1.79	20	2336
Ln(Credit Lines)	9.29	9.59	2.08	1.5	13	2941

Table A2: Deposits on Reserves and Household Financial Assets net of Deposits

This table shows the results of regressing change in Ln(Deposits) and Ln(Demand & Other Liquid Deposits) against Change in Ln(Reserves) and Change in Ln(Household Financial Assets net of Deposits) and Change in IOR to match the specification in LS-VJ (2023) for completeness. All variables are taken from FRED. All changes are calculated over a 12-month period. Δ *Ln(Reserves)* is the 12-month change in the natural logarithm of reserves, and $Ln(Reserves)_{t-12}$ is the 12-month lag of *Ln(Reserves)*. Δ *Reserves* is the 12-month change in the level of reserves and $Reserves_{t-12}$ is the corresponding 12-month lagged variable. Δ *IOR* is the level of Interest on Reserves minus its 12-month lagged value. Standard errors (Newey-West) account for auto-correlation up to 12-months. Standard errors are reported in parentheses. Data ranges from 2009M1 – 2021M11. * p<0.1, ** p<0.05, *** p<0.01

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ΔLn(Deposits)				ΔLn(Demand & Other Liquid Deposits)			
ΔLn(Reserves)	0.0877**	0.0865**	0.0144	0.0123	0.160***	0.161***	0.0784**	0.0793**
	(0.0383)	(0.0385)	(0.0193)	(0.0188)	(0.0394)	(0.0384)	(0.0377)	(0.0363)
ΔLn(Fin Assets - Deposits)	0.160		0.232**		0.157		0.237	
	(0.116)		(0.0916)		(0.147)		(0.148)	
ΔLn(Fin Assets – Insured Deposits)		0.159		0.228***		0.125		0.201
		(0.110)		(0.0791)		(0.148)		(0.145)
ΔIOR			-0.046***	-0.046***			-0.051***	-0.050***
			(0.00803)	(0.00796)			(0.0144)	(0.0142)
Constant	0.0459***	0.0457***	0.0496***	0.0495***	0.0670***	0.0688***	0.0711***	0.0730***
	(0.00870)	(0.00875)	(0.00539)	(0.00514)	(0.0106)	(0.0104)	(0.0109)	(0.0111)
N	146	146	146	146	146	146	146	146
R-Sq	0.457	0.462	0.755	0.763	0.597	0.593	0.764	0.759
Reg-Type	Newey-West	Newey-West	Newey-West	Newey-West	Newey-West	Newey-West	Newey-West	Newey-West
# Lags	12	12	12	12	12	12	12	12

Table A3: Table 2 Restricted to 2009 Q3 – 2019 Q2

This table reports the results from time-series regression of the Effective Federal Fund Rate (EFFR) minus Interest on Reserves (IOR) on reserve, deposits and credit lines restricted to the sample period of 2009 Q3 to 2019 Q2. *Ln(Reserves)* is the natural logarithm of reserves from the H.6 release, *Ln(Demand Deposits)* is the natural logarithm of the sum of demand and other liquid deposits from the H.6 release. *Ln(Time Deposits)* is the sum of small- and large-time deposits (H6 and H8 release). *Ln(Credit Lines)* is the natural logarithm of unused (other) loan commitments from FDIC insured banks (including corporate credit lines but not credit card commitments). *Ln(Usage)* is the natural logarithm of quarterly drawn credit lines of U.S. publicly listed firms sourced from Capital IQ. Panel A reports the regression of EFFR-IOR on levels of reserves, deposits (and its constituents), and credit lines. Standard errors (Newey-West) account for auto-correlation up to 12-months. * p<0.1, ** p<0.05, *** p<0.01

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Δ(EFFR-IOR)				
ΔLn(Reserves)	-0.177***	-0.191***	-0.339***	-0.177***	-0.192***	-0.339***	-0.253***	-0.354***
	(0.0458)	(0.0451)	(0.0634)	(0.0391)	(0.0365)	(0.0630)	(0.0441)	(0.0742)
Δ Ln(Deposits)		0.436			0.450			
		(0.473)			(0.622)			
Δ Ln(Demandable Deposits)			2.650*			2.669*		2.074**
			(1.367)			(1.355)		(0.894)
Δ Ln(Time Deposits)			0.840*			0.835*		0.648**
			(0.426)			(0.444)		(0.297)
Δ Ln(Unused CL)				0.0111	-0.0144	0.0568	-0.0866	-0.0188
				(0.209)	(0.233)	(0.158)	(0.189)	(0.144)
Δ Ln(Usage)							-0.0982*	-0.0660*
							(0.0569)	(0.0381)
Constant	0.0283***	0.00594	-0.145*	0.0277*	0.00601	-0.150*	0.0483**	-0.0963**
	(0.00763)	(0.0260)	(0.0867)	(0.0166)	(0.0258)	(0.0799)	(0.0231)	(0.0457)
N	117	117	117	117	117	117	117	117
R-sq	0.309	0.315	0.486	0.309	0.315	0.488	0.449	0.542
Reg-Type	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Standard-Error	Robust	Robust	Robust	Robust	Robust	Robust	Robust	Robust

Table A4. Effect of Reserves on Deposit Quantities - First Stage (Bank-level)

This table shows the first-stage results of the instrumental variable two-stage least-squares regressions in Table 4. Bank balance sheet data is sourced from Consolidated Reports of Condition and Income for a Bank with Domestic and Foreign Offices (Call Reports) of the FDIC. *Reserves* are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090). The instrument for reserves, z_{it}^{R} is defined as *Growth in Aggregate Reserves* × *Lagged Share in Reserves, averaged over past four quarters. Aggregate Reserves* are sourced from *FRED*. We use $\Delta Ln(Reserves) = Ln(Reserves)_t - Ln(Reserves)_{t-4}$ as the dependent variable. Column (1) represents the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Column (2) represents QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Column (3) represents the QEI-III period: 2008Q4 - 2014Q3. Column (4) shows results for the Post-QE III + QT period 2014Q4 - 2019Q3. All specifications control for lagged Ln(Assets), Net Income/Assets, Equity/Assets, and Primary Dealer Indicator and they contain time-fixed effects. All Cragg-Donald F-statistics are above 10 as per Staiger and Stock (1997). Standard errors are two-way clustered at the bank and time level. * p<0.1, ** p<0.05, *** p<0.01

First Stage: Change in Reserves by Period	(1)	(2)	(3)	(4)
	ΔLn(Reserves)	ΔLn(Reserves)	ΔLn(Reserves)	ΔLn(Reserves)
z_{it}^{R} (=Ln(Reserves$_t$/Reserves$_{t-1}$) × Lagged Share in Agg. Reserves over 4Q)	13.48***	12.54***	12.67***	25.87**
	(0.629)	(0.594)	(0.606)	(12.30)
Ln(Reserves)$_{t-5}$	-0.156***	-0.195***	-0.192***	-0.107***
	(0.00786)	(0.0122)	(0.0131)	(0.00846)
Constant	-0.793***	-0.896***	-1.012***	-0.501***
	(0.114)	(0.213)	(0.259)	(0.0912)
N	115839	51062	43236	30830
R-sq	0.126	0.160	0.161	0.0287
F-stat	10169107.2	578625.9	193052.1	28.30
Time-FE	Y	Y	Y	Y
Bank & Time Clustered FE	Y	Y	Y	Y
Period	Overall: 2001Q1 - 2021Q4	QE I-III + Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE I-III: 2008Q4 - 2014Q3	Post-QE III + QT2014Q4 - 2019Q3

Table A5. Effect of Reserves on Credit Line Originations - First Stage (BHC-level)

This table shows the first stage results of the instrumental variable two-stage least-squares regressions in Table 6. *Reserves* is aggregated to the bank holding company (BHC) level from Call Reports, in particular, cash and balances due from Federal Reserve Banks at the consolidated bank level (RCFD0090). The instrument for reserves, z_{it}^{R} is defined as *Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over past four quarters*. Aggregate Reserves are sourced from FRED. Column (1) represents the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Column (2) represents QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Column (3) represents the QEI-III period: 2008Q4 - 2014Q3. Column (4) shows results for the Post-QE III + QT period: 2014Q4 - 2019Q3. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, and Primary Dealer indicator lagged by one quarter along with bank and time fixed effects. All first-stage Cragg-Donald F-statistics are above the threshold of 10 as per Staiger and Stock (1997) except for column 4. However, since we cluster our standard errors, the regression satisfies the Kleibergen and Paap (2006) test for weak instruments. Standard errors are two-way clustered at the bank and time level. * p<0.1, ** p<0.05, *** p<0.01

	(1) Δ Ln(Reserves)	(2) Δ Ln(Reserves)	(3) Δ Ln(Reserves)	(4) Δ Ln(Reserves)
z_{it}^{R}	6.394***	6.343***	6.398***	21.53
	(0.858)	(0.903)	(1.016)	(25.59)
$\text{Ln(Reserves)}_{t-5}$	-0.195***	-0.245***	-0.242***	-0.122***
	(0.0254)	(0.0415)	(0.0470)	(0.0289)
Constant	-0.880	-1.417	-1.070	-1.459*
	(0.617)	(0.982)	(1.133)	(0.829)
N	2268	911	678	578
R-sq	0.263	0.344	0.347	0.117
Time-FE	Y	Y	Y	Y
Bank & Time Clustered SEs	Y	Y	Y	Y
F	27.16	33.06	27.16	6.826
Period	Overall: 2001Q1 - 2021Q4	QE I-III + Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE I-III: 2008Q4 - 2014Q3	Post-QE III + QT2014Q4 - 2019Q3

Table A6: Effect of Reserves and Deposits on Deposit Rate Spreads: 1st Stage

This table shows the first stage results of the instrumental variable two-stage least-squares regressions in Table 5. Bank Balance Sheet Data is sourced from Consolidated Reports of Condition and Income for a Bank with Domestic and Foreign Offices (Call Reports) of the FDIC. *Reserves* are cash and balances from Federal Reserve Banks at the consolidated bank-level (RCFD0090). *Total Deposits* is the sum of deposits held in domestic and foreign offices (RCON2200 + RCFN2200). The instrument for deposits, z^{D}_{it} (henceforth, *Deposit Growth Instrument)* is *the deposit growth rates of the counties the bank has a presence in, weighted by their relative deposit size last period.* Data for branch-level deposits are from FDIC's Summary of Deposits. The instrument for reserves z^{R}_{it} is defined as *Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over past four quarters. Aggregate Reserves* are sourced from *FRED*. Columns (1) & (5) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) & (6) represent QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Columns (3) & (7) represent the QEI-III period: 2008Q4 - 2014Q3. Columns (4) & (8) show results for the Post-QE III + QT period 2014Q4 - 2019Q3. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer and indicator lagged by one quarter along with bank and time fixed effects. All Cragg-Donald F-statistics are above 10 as per Staiger and Stock (1997). Standard errors are two-way clustered at the bank and time level. * p<0.1, ** p<0.05, *** p<0.01

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ln(Total Deposits)				Ln(Reserves)			
z^{R}_{it}	-0.443	-0.550*	-0.505*	-0.794	10.85***	9.125***	8.283***	28.49***
	(0.382)	(0.283)	(0.279)	(1.204)	(1.513)	(1.424)	(1.359)	(7.038)
z^{D}_{it}	0.0193***	0.0134***	0.0159***	0.0118***	0.0601***	0.0119	0.0328	0.0476**
	(0.00312)	(0.00335)	(0.00368)	(0.00289)	(0.0205)	(0.0342)	(0.0348)	(0.0235)
Constant	0.429**	0.794***	1.375***	0.857	-1.340**	-0.732	2.874*	-2.949**
	(0.204)	(0.130)	(0.244)	(0.796)	(0.601)	(1.081)	(1.678)	(1.250)
N	118696	51738	43767	31984	116058	51104	43289	30720
R-sq	0.987	0.992	0.991	0.995	0.767	0.775	0.762	0.847
F-stat	829.6	1613.6	568.7	179.9	258.1	51.73	19.26	23.16
Bank & Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered FE	Y	Y	Y	Y	Y	Y	Y	Y
Period	Overall: 2001Q1 - 2021Q4	QE I-III + Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE I-III: 2008Q4 - 2014Q3	Post-QE III + QT2014Q4 - 2019Q3	Overall: 2001Q1 - 2021Q4	QE I-III + Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE I-III: 2008Q4 - 2014Q3	Post-QE III + QT2014Q4 - 2019Q3

Table A7: Effect of Reserves on Credit Line Originations – Controlling for firm-demand

The table shows OLS and the second-stage of 2SLS IV regressions of the change in the amount of originated credit lines Δ*Ln(Credit Lines)*) of IG-rated and Non-IG rated firms in the U.S. as the dependent variable against change in bank's reserve holdings aggregated to the BHC level. The results show us the Khwaja-Mian (2008) within firm-estimation controlling for firm-demand. Reserve data is sourced from FDIC's Call Reports, credit line originations from the Refinitiv *LoanConnector* database. *Reserves* are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090). Change is the contemporary level minus the deposit level lagged by 4 quarters. Columns (1) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) represent QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Columns (3) represent the QEI-III period: 2008Q4 - 2014Q3. Columns (4) show results for the Post-QE III + QT period: 2014Q4 - 2019Q3. We report the second stage where Δ *Ln(Reserves)* is instrumented by *Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over previous 4 quarters* (z^R_{it}). All specifications control for Time-FE, lagged Ln(assets), Equity-Capital Ratio, Net Income/Assets, indicator for Primary Dealers and Ln(Reserves) lagged by five quarters. The table uses firm cluster x time FE and firm-cluster x bank FE. A firm cluster is defined as one digit SIC code and rating category level (investment grade, non-investment grade and unrated) Standard errors are clustered at the time level. * p<0.1, ** p<0.05, *** p<0.01

	(1)	(2)	(3)	(4)
			ΔLn(Credit Lines)	
ΔLn(Reserves)	0.357***	0.195***	0.155**	0.223
	(0.116)	(0.0698)	(0.0632)	(0.325)
N	7905	3044	2289	2424
Firm Cluster x Time	Y	Y	Y	Y
Firm Cluster x Bank	Y	Y	Y	Y
Time Cluster SE	Y	Y	Y	Y
Controls	Y	Y	Y	Y
Period	Overall: 2001 Q1 - 2021 Q4	QE I-III + Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE I-III: 2008Q4 - 2014Q3	Post-QE III + QT: 2014Q4-2019Q3

Table A8: Deposit Rate Spreads - OLS Regressions

The table shows OLS regressions of *3, 12, 18 and 24-month CD – Money Market (MM) savings rate spread* against bank-level *Ln(Total Deposits)* and *Ln(Reserves).* CD and MM savings rates are sourced from *S&P Global's RateWatch* deposit data. Bank-level variables are sourced from *FDIC's Call Reports* data. *Reserves* are cash and balances due from Federal Reserve Banks at the consolidated bank level (RCFD0090). *Total Deposits* is the sum of deposits held in domestic and foreign offices (RCON2200 + RCFN2200. Panel A shows the results for the overall period. Panel B shows the results QE I-III+ Pandemic QE periods. Panels C and D shows results for QE I-III and Post-QE-III+QT periods respectively. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter along with bank and time fixed effects. Standard errors are two-way clustered at the bank and time level. The sample period is 2001 Q1 – 2021 Q4. * p<0.1, ** p<0.05, *** p<0.01

Panel A	(1) 3-month CD Rate – MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	0.00684	0.0457	0.0230	0.0257
	(0.0389)	(0.0384)	(0.0426)	(0.0413)
Ln(Reserves)	-0.000562	0.00318	0.00255	0.00473*
	(0.00241)	(0.00239)	(0.00265)	(0.00252)
Constant	0.299	0.541**	0.761**	0.963***
	(0.251)	(0.268)	(0.290)	(0.273)
N	92684	98993	82810	97417
R-sq	0.610	0.766	0.752	0.759
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SEs	Y	Y	Y	Y
Reg Type	OLS	OLS	OLS	OLS
Period	Overall: 2001Q1 - 2021Q4			
Panel B	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	0.0474	0.0837***	0.0770**	0.0567*
	(0.0291)	(0.0287)	(0.0306)	(0.0284)
Ln(Reserves)	-0.00127	-0.00124	-0.000206	0.000411
	(0.00158)	(0.00167)	(0.00171)	(0.00182)
Constant	-0.0194	-0.00843	0.243	0.478*
	(0.247)	(0.238)	(0.257)	(0.246)
N	41419	44334	36772	43630
R-sq	0.596	0.747	0.761	0.782
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	2008Q4 - 2014Q3 & 2019Q4 - 2021Q4			

Panel C	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	0.0420	0.109***	0.0913**	0.0664**
	(0.0339)	(0.0317)	(0.0340)	(0.0313)
Ln(Reserves)	-0.00138	-0.00164	-0.000867	0.000355
	(0.00161)	(0.00156)	(0.00170)	(0.00179)
Constant	0.216	-0.308	0.0269	0.327
	(0.354)	(0.348)	(0.387)	(0.370)
N	36558	38966	32236	38295
R-sq	0.634	0.776	0.785	0.797
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	2008Q4 - 2014Q3			
Panel D	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	-0.0633**	-0.0721*	-0.102**	-0.110**
	(0.0274)	(0.0415)	(0.0467)	(0.0442)
Ln(Reserves)	0.00213	0.00834**	0.00736**	0.00626**
	(0.00200)	(0.00306)	(0.00314)	(0.00292)
Constant	0.434	0.314	0.777	1.316*
	(0.394)	(0.618)	(0.741)	(0.703)
N	23341	25428	21148	25069
R-sq	0.586	0.673	0.680	0.699
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	2014Q4 - 2019Q3	2014Q4 - 2019Q3	2014Q4 - 2019Q3	2014Q4 - 2019Q3

Table A9: Second Stage Results with CD – Non-Money Market Rate Spreads

The table shows the 2nd stage of 2SLS IV regressions of *3, 12, 18 and 24-month CD – Non-Money Market (MM) Savings Rate spread* against bank-level *Ln(Total Deposits)* and *Ln(Reserves).* CD and Non-MM savings rates are sourced from *S&P Global's RateWatch* deposit data. Bank-level variables are sourced from *FDIC's Call Reports* data. *Reserves* are cash and balances due from Federal Reserve Banks at the consolidated bank level (RCFD0090). *Total Deposits* is the sum total of deposits held in domestic and foreign offices (RCON2200 + RCFN2200). Panel A shows the OLS regression. Panel B shows the IV regression with *Ln(Total Deposits)* instrumented with the *County Deposit Growth Instrument* (z^D_{it}) and *Ln(Reserves)* instrumented with as *Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over previous 4 quarters*. Aggregate Reserves is taken from FRED. Panel A shows the second stage results for the Overall and QE I-III+ Pandemic QE periods. Panel B shows results for QE I-III and Post-QE-III+QT periods. All specifications control for Ln(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter along with bank and time fixed effects. Standard errors are two-way clustered at the bank and time level. The sample period is 2001 Q1 – 2021 Q4. * p<0.1, ** p<0.05, *** p<0.01

Panel A: Overall and QE-I-III + Pandemic QE periods

	(1) 3-month CD Rate - Non-MM Savings Rate	(2) 12-month CD Rate - Non-MM Savings Rate	(3) 18-month CD Rate - Non-MM Savings Rate	(4) 24-month CD Rate - Non-MM Savings Rate
Ln(Total Deposits)	0.107	0.171	0.482*	0.204
	(0.263)	(0.240)	(0.288)	(0.247)
Ln(Reserves)	-0.131***	-0.0585	-0.230***	-0.119***
	(0.0370)	(0.0599)	(0.0383)	(0.0300)
N	84006	89703	75179	88356
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4			

	(1) 3-month CD Rate - Non-MM Savings Rate	(2) 12-month CD Rate - Non-MM Savings Rate	(3) 18-month CD Rate - Non-MM Savings Rate	(4) 24-month CD Rate - Non-MM Savings Rate
Ln(Total Deposits)	0.116	0.308	0.238	0.287
	(0.330)	(0.251)	(0.444)	(0.288)
Ln(Reserves)	-0.165***	-0.0679**	-0.233**	-0.127**
	(0.0409)	(0.0258)	(0.105)	(0.0541)
N	39347	42084	34972	41432
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4			

Panel B: QE I-III and Post-QE III+QT Periods

	(1) 3-month CD Rate - Non-MM Savings Rate	(2) 12-month CD Rate - Non-MM Savings Rate	(3) 18-month CD Rate - Non-MM Savings Rate	(4) 24-month CD Rate - Non-MM Savings Rate
Ln(Total Deposits)	0.319	0.412**	0.450	0.402*
	(0.255)	(0.186)	(0.323)	(0.221)
Ln(Reserves)	-0.177***	-0.0689**	-0.244**	-0.134**
	(0.0392)	(0.0309)	(0.105)	(0.0521)
N	34578	36818	30526	36200
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	QE-I-III :2008Q4 - 2014Q3			

	(1) 3-month CD Rate - Non-MM Savings Rate	(2) 12-month CD Rate - Non-MM Savings Rate	(3) 18-month CD Rate - Non-MM Savings Rate	(4) 24-month CD Rate - Non-MM Savings Rate
Ln(Total Deposits)	-0.642	-0.146	0.378	-0.746
	(1.107)	(1.492)	(1.129)	(1.528)
Ln(Reserves)	0.442	0.0302	-0.242	0.304
	(0.424)	(0.706)	(0.526)	(0.698)
N	21426	23331	19429	23039
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Post-QE-III + QT: 2014Q4 - 2019Q3			

Table A10: Heterogeneity tables of 12-, 18- and 24-Month CD – Money Market Deposit Rates

The table shows the second-stage of 2SLS IV regressions of *12, 18 and 24-month CD – Money Market Rates* as the dependent variables against Δ*Ln(Reserves)* split into subsamples of above and below median Bank-HHI, lagged by one quarter. Bank balance sheet data is from *FDIC's Call Reports*. *Reserves* are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090). 12-, 18- and 24-month CD spreads w.r.t Money Market Rate from *S&P's RateWatch data* as the dependent variable. $\Delta Y = Y_t - Y_{t-4}$. *Bank HHI* is the Herfindahl-Hirschman Index of Deposits at the county-level aggregated to the bank-level using the banks' deposits in the counties it's present as the weights using *FDIC Summary of Deposits data*. We take the average HHI for each bank in our sample between 2001-2021 and split them between above and below median HHI groups. All specifications control for Time-FE, lagged Ln(assets), Equity-Capital Ratio, Net Income/Assets, indicator for Primary Dealers and Ln(Reserves) lagged by five quarters. All panels control for Ln(Total Deposits) and Bank-FE. Columns (1) and (5) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) and (6) represent QE I-III + Pandemic QE of 2008Q4 – 2014Q3 & 2019Q4-2021Q4. Columns (3) and (7) represent the QEI-III period: 2008Q4 – 2014Q3. Columns (4) and (8) show results for the Post-QE III + QT period 2014Q4 – 2019Q3. In all second-stage regressions, Δ*Ln(Reserves)* is instrumented by the reserve instrument (z^R_{it}): *Growth in Aggregate Reserves × Average Lagged Share in Reserves over the previous 4 quarters.* In Panels A.3-A.6, *Ln(Total Deposits)* is instrumented with the *Deposit Growth Instrument* (z^D_{it}) Standard errors are two-way clustered at the bank and time level. * p<0.1, ** p<0.05, *** p<0.01

Panel A: Heterogeneity by Bank-HHI

Panel A.1	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	12-month CD Rate - Money Market AC Rate							
	Above Median HHI				Below Median HHI			
Ln(Reserves)	-0.0530	-0.0461	-0.0461	-0.166	0.0261	0.0410	-0.00621	-1.942
	(0.0689)	(0.0418)	(0.0450)	(0.384)	(0.0341)	(0.0378)	(0.0390)	(3.837)
Ln(Total Deposits)	0.366	0.811	0.809	0.171	0.0107	-0.644	0.121	4.777
	(0.564)	(0.580)	(0.519)	(2.058)	(0.764)	(0.739)	(0.749)	(10.39)
N	44439	20729	18086	11831	45264	21355	18732	11500
Bankd and Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y	Y	Y	Y	Y
Period	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT

Panel A.2	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	18-month CD Rate - Money Market AC Rate							
	Above Median HHI				Below Median HHI			
Ln(Reserves)	-0.237***	-0.293*	-0.297**	-0.249	-0.00227	0.0253	-0.0313	-0.217
	(0.0329)	(0.146)	(0.140)	(0.350)	(0.0329)	(0.0460)	(0.0406)	(1.128)
Ln(Total Deposits)	1.330*	0.190	0.673	0.259	-0.320	-0.358	0.390	5.362
	(0.715)	(1.229)	(0.956)	(1.276)	(0.726)	(0.705)	(0.612)	(8.398)
N	37283	17224	15022	9828	37896	17748	15504	9601
Bank & Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y	Y	Y	Y	Y
Period	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT

Panel A.3	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	24-month CD Rate - Money Market AC Rate							
	Above Median HHI				Below Median HHI			
Ln(Reserves)	-0.118***	-0.130	-0.137*	-0.0499	-0.00358	0.0174	-0.0430	-2.166
	(0.0307)	(0.0792)	(0.0734)	(0.338)	(0.0340)	(0.0404)	(0.0393)	(4.128)
Ln(Total Deposits)	0.444	0.629	0.689	0.115	-0.0878	-0.504	0.365	4.595
	(0.566)	(0.656)	(0.578)	(1.726)	(0.777)	(0.767)	(0.788)	(11.05)
N	43866	20438	17819	11694	44490	20994	18381	11345
Bank & Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y	Y	Y	Y	Y
Period	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT

Panel B: Heterogeneity by Bank Capitalization

The table shows the second-stage of 2SLS IV regressions of *12, 18 and 24-month CD – Money Market Rates* as the dependent variable against Δ*Ln(Reserves)* split into subsamples of above and below median Equity/Assets ratio, lagged by one quarter. Bank balance sheet data is from *FDIC's Call Reports*. *Reserves* are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090). 12-, 18- and 24-month CD spreads w.r.t Money Market Rate from *S&P's RateWatch data* as the dependent variable. $\Delta Y = Y_t - Y_{t-4}$. Equity/Assets ratio is the ratio of items RCFD3210 – Total Bank Equity and RCFD2170 – Total Bank Assets. All specifications control for Time-FE, lagged Ln(assets), Equity-Capital Ratio, Net Income/Assets, indicator for Primary Dealers and Ln(Reserves) lagged by five quarters. Panels A.3-A.8 control for Ln(Total Deposits) and Bank-FE. Columns (1) and (5) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) and (6) represent QE I-III + Pandemic QE of 2008Q4 – 2014Q3 & 2019Q4-2021Q4. Columns (3) and (7) represent the QEI-III period: 2008Q4 – 2014Q3. Columns (4) and (8) show results for the Post-QE III + QT period 2014Q4 – 2019Q3. In all second-stage regressions, Δ*Ln(Reserves)* is instrumented by the reserve instrument (z^R_{it}): *Growth in Aggregate Reserves × Average Lagged Share in Reserves over the previous 4 quarters.* In Panels B.3-B.6, *Ln(Total Deposits)* is instrumented with the *Deposit Growth Instrument* (z^D_{it}) Standard errors are two-way clustered at the bank and time level. * p<0.1, ** p<0.05, *** p<0.01

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel B.1	12-month CD Rate - Money Market AC Rate							
	Above Median Equity/Assets				Below Median Equity/Assets			
Ln(Reserves)	0.0124	0.0204	0.0300	11.96	-0.0305	-0.160***	-0.113***	-0.663*
	(0.0566)	(0.0572)	(0.0670)	(121.4)	(0.0814)	(0.0466)	(0.0346)	(0.332)
Ln(Total Deposits)	0.279	0.444	0.338	-25.16	0.0231	0.565	1.148*	2.032
	(0.642)	(0.570)	(0.597)	(263.7)	(0.688)	(0.779)	(0.649)	(2.181)
N	37041	18044	15761	10203	52504	23864	20894	12975
Bank & Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y	Y	Y	Y	Y
Period	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT

Panel B.2	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	18-month CD Rate - Money Market AC Rate							
	Above Median Equity/Assets				Below Median Equity/Assets			
Ln(Reserves)	-0.0624	-0.0261	-0.0168	0.138	-0.196***	-0.304	-0.184	-0.515
	(0.0595)	(0.0455)	(0.0543)	(2.884)	(0.0235)	(0.244)	(0.192)	(0.368)
Ln(Total Deposits)	0.145	0.107	0.189	-1.217	0.581	-0.0922	0.652	1.516
	(0.737)	(0.501)	(0.519)	(6.013)	(0.725)	(1.646)	(0.908)	(1.643)
N	30833	14903	12987	8557	44185	19903	17387	10740
Bank & Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y	Y	Y	Y	Y
Period	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT
Panel B.3	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	24-month CD Rate - Money Market AC Rate							
	Above Median Equity/Assets				Below Median Equity/Assets			
Ln(Reserves)	0.0539	0.0585	0.0746	15.97	-0.111**	-0.165	-0.121	-0.342
	(0.0534)	(0.0463)	(0.0559)	(230.3)	(0.0501)	(0.120)	(0.115)	(0.222)
Ln(Total Deposits)	-0.0859	-0.117	-0.295	-38.85	0.213	0.665	1.222*	1.039
	(0.703)	(0.606)	(0.686)	(562.9)	(0.721)	(0.840)	(0.669)	(1.158)
N	36258	17653	15384	10026	51939	23605	20656	12862
Bank & Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y	Y	Y	Y	Y
Period	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT	Overall	QE I-III+Pandemic QE	QE I-III	Post-QE III+QT

Table A11: Loan Quantities - Impact due to Exogenous Increase in Bank Reserves

The table represents the second-stage results of loan quantities regression The reserve instrument used here is *Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over previous 4 quarters*. Total Loans is the sum of Loans and leases held for sale and loans and leases net of unearned income (RCFD5369+RCFDB528 of Call Reports). Reserves are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090 of Call Reports). Aggregate Reserves is taken from FRED. $\Delta Y_{it}=Y_{it}-Y_{it-4}$. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter. All regressions contain Quarter Time-Fixed Effects. Standard errors are two-way clustered at the bank and quarter level. Columns (1) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) represent QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Columns (3) represent the QEI-III period: 2008Q4 - 2014Q3. Columns (4) show results for the Post-QE III + QT period 2014Q4 - 2019Q * p<0.1, ** p<0.05, *** p<0.01

	(1)	(2)	(3)	(4)
	ΔLn(Total Loans)	ΔLn(Total Loans)	ΔLn(Total Loans)	ΔLn(Total Loans)
ΔLn(Reserves)	-0.0944***	-0.102***	-0.102***	0.455
	(0.0211)	(0.0224)	(0.0201)	(0.448)
$Ln(Reserves)_{t-5}$	-0.0202***	-0.0255***	-0.0249***	0.0443
	(0.00351)	(0.00457)	(0.00425)	(0.0468)
N	115350	50834	43071	30701
Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE-I-III :2008Q4 - 2014Q3	Post-QE-III + QT: 2014Q4 - 2019Q3

Table A12: Control Variable Definitions for Table 8

Variable name	Definition	Source
Consumer Loans / Assets	Consumer loans (%Assets)	Call Reports
Credit Card Commitments / Assets	Unused credit card commitments (%Assets)	Call Reports
Current Primary Dealer Indicator	Indicator = 1 if bank is current primary dealer bank (https://www.newyorkfed.org/markets/primarydealers#primary-dealers)	NY Fed
Deposits / Assets	Deposits (%Assets)	Call Reports
Deposits / Loans	Deposits (%Loans)	Call Reports
Derivatives / Assets	Interest rate, exchange rate and credit derivatives (% Assets)	Call Reports
Distance-to-Default	Mean(ROA+CAR)/volatility(ROA) where CAR is the capital-to-asset ratio and ROA is return on assets	Call Reports
Equity Beta	Equity Beta is constructed relative to the S&P 500 using daily stock returns over the 2019 period and multiplied with the realized excess return of the S&P 500 over the 1/1/2020 – 3/23/2020 period. S&P 500 returns are (daily) excess return of the S&P 500 index; log excess returns are calculated as the $\log(1 + r - r_f)$, where r is the simple daily return (based on the daily closing price, adjusted for total return factor and daily adjustment factor), and r_f is the 1-month daily Treasury-bill rate	CRSP
Equity Ratio	Equity (%Assets)	Call Reports
Idiosyncratic Volatility	Annualized standard deviation of the residuals from the market model	CRSP
Income Diversity	1 minus the absolute value of the ratio of the difference between net interest income and other operating income to total operating income	Call Reports
Loans / Assets	Total loans (%Assets)	Call Reports
Log(Assets)	Natural log of Assets	Call Reports
MV	Market value of equity (12/31/2019)	Vlab
Non-Interest Income	Non-interest-income (%Operating revenues)	Call Reports
NPL / Loans	Non-performing loans (%Loans)	Call Reports
Real Estate Beta	Slope of the regression of weekly excess stock returns on the Fama and French real estate industry excess return in a regression that controls for the MSCI World excess return	CRSP
ROA	Return on assets: Net Income / Assets	Call Reports
SRISK	Bank capital shortfall in a systemic crisis as in Acharya *et al.* (2012)	Vlab
SRISK/Assets	Bank capital shortfall in a systemic crisis as in Acharya *et al.* (2012) scaled by total assets	Vlab and Call Reports

Additional Data Description

We obtain data on the origination of credit lines by U.S. non-financial firms from *Refinitiv LoanConnector*. We rely on syndicated credit line data to get directly at their originations. While the Call Reports data provide outstanding credit lines (to both corporations and individuals) for a bank, time-series variation in this variable includes both the origination of new credit lines as well as the expiry of existing credit lines. Furthermore, since we also analyze fees on credit lines at the time of origination, focusing on syndicated credit lines maintains consistency of datasets across different parts of our analysis.

Much of our other data, however, are defined at the bank level. Using a link-table of parent-offspring relationships provided by the Federal Reserve Bank, we link each commercial bank in each quarter to its respective BHC. We then aggregate data from the commercial bank level to the BHC.

Appendix B: Alternative Instruments

Alternative Reserves Instrument-1

One alternative instrument is to multiply the log growth in aggregate reserves over the year (instead of the quarter) by the lagged reserve share. It has similar effects (see Online Appendix Table A4). The previous quarter's change in reserves, i.e., aggregate quarterly reserve growth times lagged share, is likely to be more exogenous than the aggregate reserve growth over the previous year, in that banks are less likely to have fully optimized individual balance sheets in response to the change within a quarter.

$$z_{it}^{Ralt1} = Ln\left(\frac{Aggregate\ Reserves_t}{Aggregate\ Reserves_{t-4}}\right) \times Reserve\ Share_{t-1}$$

Table B1.1: Deposit & Credit Line Quantities with Alternative Reserves Instrument 1

The table represents the first-stage and second-stage results of deposit quantities using an alternative reserves instrument. The reserve instrument used here is Ln(Aggregate Reserves $_t$/Aggregate Reserves $_{t-4}$) x Reserve Share $_{t-1}$ *($z^{Ralt1}{}_{it}$)*. Total Deposits is the sum of Total Domestic and Foreign Deposits held at the depository level (RCON2200+RCFN2200 of Call Reports). Reserves are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090 of Call Reports). Aggregate Reserves is taken from FRED. Panel A reports the 1st Stage of the endogenous regressor ΔLn(Reserves) and the 2nd Stage with ΔLn(Total Deposits). Panel B reports the 2nd Stage with ΔLn(*Demand and Savings deposits*)(RCON2210+RCON6810+RCON0352 of Call Reports) and ΔLn(*Time Deposits)* (RCON6648 + RCONJ473 + RCONJ474) or (RCON6648+RCON2604) $\Delta Y_{it}=Y_{it}-Y_{it-4}$. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter along with bank and time fixed effects. Standard errors are two-way clustered at the bank and quarter level. Columns (1) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) represent QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Columns (3) represent the QEI-III period: 2008Q4 - 2014Q3. Columns (4) show results for the Post-QE III + QT period 2014Q4 – 2019. All first-stage regressions have a Cragg-Donald F-statistic above 10, which satisfies the weak instrument test as per Staiger and Stock (1997) * p<0.1, ** p<0.05, *** p<0.01

Panel A: 1st Stage

1st Stage	(1) ΔLn(Reserves)	(2) ΔLn(Reserves)	(3) ΔLn(Reserves)	(4) ΔLn(Reserves)
$z^{Ralt1}{}_{it}$ (=Ln(Aggregate Reserves $_t$/Aggregate Reserves $_{t-4}$) x Reserve Share $_{t-1}$)	4.216***	3.930***	3.911***	15.00**
	(0.694)	(0.836)	(0.603)	(5.929)
Ln(Reserves)$_{t-5}$	-0.156***	-0.195***	-0.192***	-0.107***
	(0.00786)	(0.00723)	(0.0131)	(0.00845)
Constant	1.100***	1.616***	1.563***	0.734***
	(0.0522)	(0.0582)	(0.0871)	(0.0574)
N	115886	51082	43251	30842
F-stat	90.94	138.0	51.59	30.32
R-Sq	0.127	0.161	0.161	0.0288
Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE-I-III :2008Q4 - 2014Q3	Post-QE-III + QT: 2014Q4 - 2019Q3

Panel B: 2nd Stage Results with Demand+Savings & Time Deposits

Panel B.1	(1) ΔLn(Demand + Savings Deposits)	(2) ΔLn(Demand + Savings Deposits)	(3) ΔLn(Demand + Savings Deposits)	(4) ΔLn(Demand + Savings Deposits)
ΔLn(Reserves)	0.126***	0.116**	0.110**	0.340
	(0.0320)	(0.0428)	(0.0464)	(0.309)
$Ln(Reserves)_{t-5}$	0.0146***	0.0162*	0.0140	0.0311
	(0.00521)	(0.00906)	(0.00971)	(0.0323)
N	115580	50941	43145	30782
Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE-I-III :2008Q4 - 2014Q3	Post-QE-III + QT: 2014Q4 - 2019Q3

Panel B.2	(1) ΔLn(Time Deposits)	(2) ΔLn(Time Deposits)	(3) ΔLn(Time Deposits)	(4) ΔLn(Time Deposits)
ΔLn(Reserves)	-0.126**	-0.108*	-0.120**	1.004
	(0.0489)	(0.0561)	(0.0549)	(0.612)
$Ln(Reserves)_{t-5}$	-0.0281***	-0.0326***	-0.0350***	0.0985
	(0.00785)	(0.0115)	(0.0112)	(0.0645)
N	114734	50573	42868	30563
Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE-I-III :2008Q4 - 2014Q3	Post-QE-III + QT: 2014Q4 - 2019Q3

Panel C: 1st Stage Credit Line Results

This table shows the first stage results of the instrumental variable two-stage least-squares regressions in Panel D. *Reserves* is aggregated to the bank holding company (BHC) level from Call Reports, in particular, as. cash and balances due from Federal Reserve Banks at the consolidated bank level (RCFD0090). The instrument for reserves is defined as Ln(Aggregate Reserves $_t$/Aggregate Reserves $_{t-4}$) x Reserve Share $_{t-1)}$. Aggregate Reserves are sourced from FRED. Column (1) represents the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Column (2) represents QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Column (3) represents the QEI-III period: 2008Q4 - 2014Q3. Column (4) shows results for the Post-QE III + QT period: 2014Q4 - 2019Q3. All specifications contain time fixed effects. All first-stage regressions have a Cragg-Donald F-statistic above 10, which satisfies the weak instrument test as per Staiger and Stock (1997) except column (4). Standard errors are two-way clustered at the bank and time level. * p<0.1, ** p<0.05, *** p<0.01

	(1) Δ Ln(Reserves)	(2) Δ Ln(Reserves)	(3) Δ Ln(Reserves)	(4) Δ Ln(Reserves)
$z^{Rall}{}_{it}$ (=Ln(Aggregate Reserves $_t$/Aggregate Reserves $_{t-4}$) x Reserve Share $_{t-1)}$	$2.06\times10^{-6***}$	$2.03\times10^{-6***}$	$1.68\times10^{-6***}$	$2.55\times10^{-6***}$
	(0.337×10^{-6})	(0.326×10^{-6})	(0.371×10^{-6})	(8.52×10^{-6})
Ln(Reserves)$_{t-5}$	-0.189***	-0.234***	-0.434***	-0.117***
	(0.0220)	(0.0351)	(0.0573)	(0.0282)
Constant	-0.777	-1.236	8.155	-1.502*
	(0.657)	(1.159)	(11.41)	(0.769)
N	2239	895	668	572
R-sq	0.267	0.354	0.422	0.125
Time-FE	Y	Y	Y	Y
Bank & Time Clustered SEs	Y	Y	Y	Y
F	17.16	11.43	45.15	4.652
Period	Overall: 2001Q1 - 2021Q4	QE I-III + Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE I-III: 2008Q4 - 2014Q3	Post-QE III + QT2014Q4 - 2019Q3

Panel D: 2nd Stage Results with Ln(Credit Lines) as the 2nd Stage Dependent Variable

The table shows OLS and the second-stage of 2SLS IV regressions of the Δ the amount of originated credit lines ΔLn(Credit Lines)) of investment-grade and unrated firms in the U.S. as the dependent variable against Δ bank's reserve holdings aggregated to the BHC level. Reserve data is sourced from FDIC's Call Reports, credit line originations from the Refinitiv *LoanConnector* database. Reserves are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090). Change is the contemporary level minus the deposit level lagged by 4 quarters. All specifications control for time-FE. Columns (1) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) represent QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Columns (3) represent the QEI-III period: 2008Q4 - 2014Q3. Columns (4) show results for the Post-QE III + QT period: 2014Q4 - 2019Q3. We report the second stage where Δ Ln(Reserves) is instrumented by Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over previous 4 quarters (z^R_{it}) Standard errors are two-way clustered at the bank and time or at the time level (second stage). Newey West SEs correcting for autocorrelation up to four quarters are also reported in Panel A. * p<0.1, ** p<0.05, *** p<0.01

	(1)	(2)	(3)	(4)
	Δ	Δ	Δ	Δ
	Ln(Credit Lines)	Ln(Credit Lines)	Ln(Credit Lines)	Ln(Credit Lines)
Δ Ln(Reserves)	0.0590*	0.0628*	0.0632*	-0.382
	(0.0344)	(0.0353)	(0.0351)	(0.392)
$Ln(Reserves)_{t-5}$	-0.00784	-0.00422	-0.00416	-0.0262
	(0.00913)	(0.0134)	(0.0135)	(0.0311)
N	2235	894	669	570
Time-FE	Y	Y	Y	Y
Bank & Time Clustered SEs	Y	Y	Y	Y
Reg Type	IV	IV	IV	IV
Period	Overall: 2001Q1 - 2021Q4	QE I-III + Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE I-III: 2008Q4 - 2014Q3	Post-QE III + QT2014Q4 - 2019Q3

Table B1.2: 1st Stage for Deposit Rate Spread Regressions with Alternative Reserves Instrument 1

The table represents the first-stage regressions in the 2SLS IV regression of Deposit Spreads with the Reserve Instrument replaced with the alternative reserve *instrument - Ln(Aggregate Reserves $_t$/Aggregate Reserves $_{t-4}$) x Reserve Share $_{t-1}$ (z^{Ralt}_{it}). Total Deposits* is the sum of Total Domestic and Foreign Deposits held at the depository level (RCON2200+RCFN2200 of Call Reports). *Reserve*s are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090 of Call Reports). *Aggregate Reserves* is taken from FRED. The *County Deposit Growth Instrument (z^{D}_{it})* is the log of the ratio of contemporary to one-quarter lagged level of total county deposits summed across all the counties the bank has a presence. Columns (1) & (5) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) & (6) represent QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Columns (3) & (7) represent the QEI-III period: 2008Q4 - 2014Q3. Columns (4) & (8) show results for the Post-QE III + QT period 2014Q4 - 2019Q3. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter along with bank and time fixed effects. All first-stage regressions have a Cragg-Donald F-statistic above 10, which satisfies the weak instrument test as per Staiger and Stock (1997). Standard errors are two-way clustered at the bank and time level. * p<0.1, ** p<0.05, *** p<0.01

	(1) Ln(Total Deposits)	(2) Ln(Total Deposits)	(3) Ln(Total Deposits)	(4) Ln(Total Deposits)	(5) Ln(Reserves)	(6) Ln(Reserves)	(7) Ln(Reserves)	(8) Ln(Reserves)
Ln(Aggregate Reserves $_t$/Aggregate Reserves $_{t-4}$) x Reserve Share $_{t-1}$	-0.147***	-0.160***	-0.157***	6.837	3.222***	2.451***	2.205***	26.79***
	(0.0453)	(0.0490)	(0.0473)	(6.696)	(0.891)	(0.547)	(0.453)	(8.029)
County Deposit Growth Instrument	0.0174***	0.0162***	0.0214***	0.00617	0.0189	-0.00350	0.0221	0.0470*
	(0.00376)	(0.00567)	(0.00634)	(0.00638)	(0.0212)	(0.0356)	(0.0327)	(0.0258)
Constant	0.501**	1.032***	1.975***	1.156	-1.372*	-0.421	2.926	-2.457*
	(0.200)	(0.349)	(0.471)	(0.712)	(0.816)	(1.180)	(1.730)	(1.266)
N	148542	61253	52728	37355	132517	56086	48029	32177
R-sq	0.934	0.957	0.965	0.988	0.721	0.762	0.755	0.843
F-stat	774.9	367.8	263.5	99.17	31.55	17.80	11.97	25.01
Bank & Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE-I-III :2008Q4 - 2014Q3	Post-QE-III + QT: 2014Q4 - 2019Q3	Overall: 2001Q1-2021Q4	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE-I-III :2008Q4 - 2014Q3	Post-QE-III + QT: 2014Q4 - 2019Q3

Table B1.3: **Deposit Spread & Credit Line Costs: 2nd Stage with Alt. Reserves Instrument 1**

The table shows 2nd stage of 2SLS IV regressions of *3, 12, 18 and 24-month CD – Money Market (MM) Savings spread* against bank-level *Ln(Total Deposits)* and *Ln(Reserves).* CD and MM Savings rates are sourced from *S&P Global's RateWatch* deposit data. Bank-level variables are sourced from *FDIC's Call Reports* data. *Reserves* are cash and balances due from Federal Reserve Banks at the consolidated bank level (RCFD0090). *Total Deposits* are the sum total of deposits held in domestic and foreign offices (RCON2200 + RCFN2200). Panel A shows the OLS regression. Panel B shows the IV regression with *Ln(Total Deposits)* instrumented with the *County Deposit Growth Instrument* (z^{D}_{it}) and *Ln(Reserves)* instrumented with Ln(Aggregate Reserves $_{t}$/Aggregate Reserves $_{t-4}$) x Reserve Share $_{t-1}$ (z^{Ralt}_{it}). Panel A shows the second stage results for the Overall and QE I-III+ Pandemic QE periods. Panel B shows results for QE I-III and Post-QE-III+QT periods. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter along with bank and time fixed effects. Standard errors are two-way clustered at the bank and time level. The sample period is 2001 Q1 – 2021 Q4. * p<0.1, ** p<0.05, *** p<0.01

Panel A: Overall and QE-I-III + Pandemic QE periods

	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	0.411	0.625	1.082**	0.486
	(0.518)	(0.489)	(0.504)	(0.489)
Ln(Reserves)	-0.159***	-0.0567	-0.186***	-0.102**
	(0.0495)	(0.0898)	(0.0354)	(0.0409)
N	89970	96044	80409	94545
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4			
	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	0.302	0.694	0.519	0.389
	(0.593)	(0.451)	(0.667)	(0.467)
Ln(Reserves)	-0.204***	-0.0607	-0.216	-0.0997
	(0.0697)	(0.0491)	(0.131)	(0.0728)
N	40859	43728	36277	43037
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4			

Panel B: QE-I-III and Post-QE-III+QT periods

	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	0.930*	1.074**	1.052*	0.796*
	(0.525)	(0.465)	(0.598)	(0.463)
Ln(Reserves)	-0.205***	-0.0575	-0.218*	-0.101
	(0.0596)	(0.0561)	(0.118)	(0.0648)
N	36588	39020	32282	38346
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	QE-I-III :2008Q4 - 2014Q3			

	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	-0.332	-0.347	0.232	-0.825
	(0.876)	(1.739)	(1.475)	(1.607)
Ln(Reserves)	0.248	0.00351	-0.155	0.138
	(0.167)	(0.437)	(0.420)	(0.402)
N	22524	24558	20454	24230
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Post-QE-III + QT: 2014Q4 - 2019Q3			

B2: Alternative Reserves Instrument 2

Yet another instrument that can be considered is the log growth in aggregate reserves multiplied by the bank's lagged share of "eligible" securities, where "eligible" refers to collateral that can be tendered to the Fed in exchange for reserves, averaged over previous four quarters. While this instrument leads to similar results for deposit quantities, in line with the theory of Acharya and Rajan (2021) it does not lead to lower term deposit spreads (see Online Appendix Table A6). A possible explanation is that more eligible securities can lead to a greater acquisition of reserves, but it also implies a higher stock of longer-term fixed-income securities which the bank will seek to maturity-match with longer-term deposits, confounding the maturity-shortening effect of reserves.

$$z_{it}^{Ralt2} = Ln\left(\frac{Aggregate\ Reserves_t}{Aggregate\ Reserves_{t-1}}\right) \times Average\ share\ of\ Eligible\ Assets\ over\ past\ four\ quarters$$

Table B2.1: Alternative Reserves Instrument 2

The table represents the first-stage and second-stage results of deposit quantities and spreads using an alternative reserves instrument. The reserve instrument used here is Ln(Aggregate Reserves $_t$/Aggregate Reserves $_{t-4}$) x Lagged Average Eligible Securities Share over previous four quarter ($z^{Ral2t}{}_{it}$). Eligible Securities is the sum of US Treasuries and Agency MBS securities reported in Schedule RC-B of FDIC Call Reports. Deposits is the sum of Total Domestic and Foreign Deposits held at the depository level (RCON2200+RCFN2200 of Call Reports). Reserves are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090 of Call Reports). Aggregate Reserves is taken from FRED. Panel A reports the 1st Stage of the endogenous regressor ΔLn(Reserves) with the instrument $z^{Ral2t}{}_{it}$. Panel B shows the 1st stage results with deposit and reserve instrument. Panel C.1 shows the 2nd Stage with ΔLn(Total Deposits). Panel C.2 and C.3 report the 2nd Stage with ΔLn(*Demand and Savings deposits*) (RCON2210+RCON6810+RCON0352 of Call Reports) and ΔLn(*Time Deposits)* (RCON6648 + RCONJ473 + RCONJ474) or (RCON6648+RCON2604). Panel D shows the 2nd stage results for the CD-Savings Rate Spreads. $\Delta Y_{it}=Y_{it}-Y_{it-4}$. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter. The deposit quantity regressions contain time fixed effects, and the deposit rate regressions contain bank and time fixed effects. Standard errors are two-way clustered at the bank and quarter level. Columns (1) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) represent QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Columns (3) represent the QEI-III period: 2008Q4 - 2014Q3. Columns (4) show results for the Post-QE III + QT period 2014Q4 - 2019Q. All first-stage regressions have a Cragg-Donald F-statistic above 10, which satisfies the weak instrument test as per Staiger and Stock (1997). * p<0.1, ** p<0.05, *** p<0.01

Panel A: 1st Stage with Changes in Reserve Quantities

	(1) Δ Ln(Reserves)	(2) Δ Ln(Reserves)	(3) Δ Ln(Reserves)	(4) Δ Ln(Reserves)
z^{Ralt2}_{it} = Growth in Agg. Reserves # Past 4Q Treasury & Guaranteed Securities share	18.92***	17.24***	18.55***	19.31
	(1.548)	(2.203)	(0.615)	(12.06)
L5.Ln(Reserves)	-0.156***	-0.195***	-0.192***	-0.107***
	(0.00783)	(0.0122)	(0.0131)	(0.00801)
Constant	-0.771***	-0.865***	-0.975***	-0.498***
	(0.109)	(0.206)	(0.249)	(0.0890)
N	117384	51089	43255	32320
R-sq	0.126	0.161	0.161	0.0286
F-stat	157.9	77.30	6496.3	30.73
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered FE	Y	Y	Y	Y
Reg	OLS	OLS	OLS	OLS
Period	Overall: 2001 Q1 - 2021 Q1	QE I-III + Pandemic QE: 2008 Q4-2014 Q4 & 2019 Q4 - 2021Q4	QE I-III: 2008 Q4-2014	Post QE-III+QT

Panel B: 1st Stage with Deposit and Reserves Instrument

	(1) Ln(Reserves)	(2) Ln(Reserves)	(3) Ln(Reserves)	(4) Ln(Reserves)	(5) Ln(Total Deposits)	(6) Ln(Total Deposits)	(7) Ln(Total Deposits)	(8) Ln(Total Deposits)
Growth in Agg. Reserves # Past 4Q Treasury & Guaranteed Securities share	14.70***	10.76***	10.64***	23.89	-0.414***	-0.795***	-0.524***	6.141
	(1.328)	(1.474)	(1.314)	(17.10)	(0.147)	(0.250)	(0.156)	(6.582)
Deposit Bartik Instrument	0.0175	-0.00313	0.0212	0.0513**	0.0195***	0.0141***	0.0167***	0.0135***
	(0.0218)	(0.0354)	(0.0328)	(0.0243)	(0.00218)	(0.00343)	(0.00323)	(0.00419)
Constant	-1.222	0.165	3.752**	-2.651**	0.518***	0.592***	1.295***	0.687
	(0.809)	(1.165)	(1.580)	(1.192)	(0.0923)	(0.143)	(0.163)	(0.446)
N	131950	56016	47919	34009	537940	209697	164822	116215
R-sq	0.728	0.765	0.755	0.842	0.988	0.990	0.990	0.996
F-stat	55.79	25.07	16.37	32.98	3358.4	1541.1	860.9	218.1
Bank & Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered FE	Y	Y	Y	Y	Y	Y	Y	Y
Reg	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Period	Overall: 2001 Q1 - 2021 Q1	QE I-III + Pandemic QE: 2008 Q4-2014 Q4 & 2019 Q4 - 2021Q4	QE I-III: 2008 Q4-2014	Post QE-III+QT	Overall: 2001 Q1 - 2021 Q1	QE I-III + Pandemic QE: 2008 Q4-2014 Q4 & 2019 Q4 - 2021Q4	QE I-III: 2008 Q4-2014	Post QE-III+QT

Panel C.1: 2nd Stage with Demand + Savings Deposits

	(1) Δ Ln(Demand + Savings Deposits)	(2) Δ Ln(Demand + Savings Deposits)	(3) Δ Ln(Demand + Savings Deposits)	(4) Δ Ln(Demand + Savings Deposits)
ΔLn(Reserves)	0.0673***	0.0464	0.0454*	0.984
	(0.0126)	(0.0316)	(0.0235)	(0.652)
$Ln(Reserves)_{t-5}$	0.00539**	0.00256	0.00147	0.101
	(0.00260)	(0.00738)	(0.00601)	(0.0678)
N	117076	50948	43149	32258
Time-FE	Y	Y	Y	Y
Bank & Time Clustered FE	Y	Y	Y	Y
Reg	IV	IV	IV	IV
Period	Overall: 2001 Q1 - 2021 Q1	QE I-III + Pandemic QE: 2008 Q4-2014 Q4 & 2019 Q4 - 2021Q4	QE I-III: 2008 Q4-2014	Post QE-III+QT

Panel C.2: 2nd Stage with Time Deposits

	(1) Δ Ln(Time Deposits)	(2) Δ Ln(Time Deposits)	(3) Δ Ln(Time Deposits)	(4) Δ Ln(Time Deposits)
Δ Ln(Reserves)	-0.152***	-0.128**	-0.132***	1.139
	(0.0539)	(0.0529)	(0.0343)	(0.750)
$Ln(Reserves)_{t-5}$	-0.0321***	-0.0365***	-0.0373***	0.113
	(0.00877)	(0.0111)	(0.00761)	(0.0778)
N	116227	50579	42872	32037
Time-FE	Y	Y	Y	Y
Bank & Time Clustered FE	Y	Y	Y	Y
Reg	IV	IV	IV	IV
Period	Overall: 2001 Q1 - 2021 Q1	QE I-III + Pandemic QE: 2008 Q4-2014 Q4 & 2019 Q4 - 2021Q4	QE I-III: 2008 Q4-2014	Post QE-III+QT

Panel D.1: 2nd Stage with Deposit Rate Spreads – Overall Period

	(1) 3-month CD Rate – MM Savings Rate	(2) 12-month CD Rate – MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	0.0584	0.306	0.694	0.312
	(0.435)	(0.393)	(0.447)	(0.437)
Ln(Reserves)	-0.0588	0.00283	-0.123**	-0.0832
	(0.0490)	(0.0473)	(0.0475)	(0.0508)
N	90659	96867	80975	95326
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered FE	Y	Y	Y	Y
Reg	IV	IV	IV	IV
Period	Overall: 2001 Q1 - 2021 Q1	Overall: 2001 Q1 - 2021 Q1	Overall: 2001 Q1 - 2021 Q1	Overall: 2001 Q1 - 2021 Q1

Panel D.2: 2nd Stage with Deposit Rate Spreads – QE I-III + Pandemic QE

	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	-0.107	0.556	0.392	0.362
	(0.494)	(0.508)	(0.514)	(0.464)
Ln(Reserves)	-0.0307	0.0565*	-0.0832	-0.0447
	(0.0320)	(0.0295)	(0.0514)	(0.0362)
N	41259	44151	36615	43447
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered FE	Y	Y	Y	Y
Reg	IV	IV	IV	IV
Period	QE I-III + Pandemic QE: 2008 Q4-2014 Q4 & 2019 Q4 - 2021Q4	QE I-III + Pandemic QE: 2008 Q4-2014 Q4 & 2019 Q4 - 2021Q4	QE I-III + Pandemic QE: 2008 Q4-2014 Q4 & 2019 Q4 - 2021Q4	QE I-III + Pandemic QE: 2008 Q4-2014 Q4 & 2019 Q4 - 2021Q4

Panel D.3: 2nd Stage with Deposit Rate Spreads – QE I-III periods

	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	0.375	0.811	0.829*	0.772
	(0.467)	(0.490)	(0.480)	(0.480)
Ln(Reserves)	-0.0467	0.0365	-0.114**	-0.0766**
	(0.0300)	(0.0273)	(0.0479)	(0.0351)
N	36404	38789	32085	38118
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered FE	Y	Y	Y	Y
Reg	IV	IV	IV	IV
Period	QE I-III: 2008 Q4-2014	QE I-III: 2008 Q4-2014	QE I-III: 2008 Q4-2014	QE I-III: 2008 Q4-2014

Panel D.4: 2nd with Deposit Rate Spreads – Post QE-III+QT periods

	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	-0.515	-1.230	-0.160	-1.659
	(0.862)	(1.586)	(1.238)	(1.657)
Ln(Reserves)	0.256	0.264	-0.0291	0.424
	(0.181)	(0.406)	(0.415)	(0.389)
N	23270	25351	21080	24993
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered FE	Y	Y	Y	Y
Reg	IV	IV	IV	IV
Period	Post QE-III+QT	Post QE-III+QT	Post QE-III+QT	Post QE-III+QT

Alternative Deposit Instruments

Table B3.1: Alternative Deposit Instruments – Senior Share Instrument

The table represents the first-stage regressions in the 2SLS IV regression of Deposit Spreads with the Deposit Instrument replaced with the Senior Share Instrument defined as $z_{it}^{Dss} = ln\left(\frac{\sum_{c \in C_{it}} Senior\ Share_{ct} \times County\ Deposits_{ct}}{\sum_{c \in C_{it-1}} County\ Deposits_{ct-1}}\right), where\ C_{it}\ is\ the\ set\ of\ all\ counties\ where\ the\ bank\ i\ has\ presence.$ Senior Share is share of county population above 65 years of age from Census Bureau data. County-level deposits are estimated from FDIC's Summary of Deposits. Becker (2007) uses senior share at the county level to describe growth in county-level deposits. Total Deposits is the sum of Total Domestic and Foreign Deposits held at the depository level (RCON2200+RCFN2200 of Call Reports). Reserves are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090 of Call Reports). Reserves instrument is defined as *Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over previous 4 quarters.* Aggregate Reserves is taken from FRED. Columns (1) & (5) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) & (6) represent QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Columns (3) & (7) represent the QEI-III period: 2008Q4 - 2014Q3. Columns (4) & (8) show results for the Post-QE III + QT period 2014Q4 - 2019Q3. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter along with bank and time fixed effects. All first-stage regressions have a Cragg-Donald F-statistic above 10, which satisfies the weak instrument test as per Staiger and Stock (1997). Standard errors are two-way clustered at the bank and time level. * p<0.1, ** p<0.05, *** p<0.01

	(1) Ln(Total Deposits)	(2) Ln(Total Deposits)	(3) Ln(Total Deposits)	(4) Ln(Total Deposits)	(5) Ln(Reserves)	(6) Ln(Reserves)	(7) Ln(Reserves)	(8) Ln(Reserves)
Growth in Agg Reserves (qoq) X Average Past 4Q Reserve Share	-0.422*	-0.494**	-0.411**	5.690	10.68***	8.798***	8.085***	30.06
	(0.220)	(0.217)	(0.180)	(6.624)	(1.214)	(0.767)	(0.708)	(18.38)
Senior Share Instrument	0.0174***	0.0147**	0.0209***	0.00651	0.0307	-0.0195	0.0182	0.0417
	(0.00437)	(0.00578)	(0.00644)	(0.00728)	(0.0249)	(0.0394)	(0.0345)	(0.0285)
Constant	0.527**	1.100***	2.298***	1.199	-1.501*	-0.635	3.120	-2.762*
	(0.234)	(0.375)	(0.455)	(0.783)	(0.887)	(1.249)	(1.836)	(1.331)
N	133401	57788	49450	34572	121355	53196	45293	31245
R-sq	0.973	0.977	0.975	0.994	0.731	0.766	0.756	0.844
F-stat	622.0	306.5	159.8	82.42	40.76	49.73	60.82	21.70
Bank & Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE-I-III :2008Q4 - 2014Q3	Post-QE-III + QT: 2014Q4 - 2019Q3	Overall: 2001Q1-2021Q4	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE-I-III :2008Q4 - 2014Q3	Post-QE-III + QT: 2014Q4 - 2019Q3

Table B3.2: Deposit Spread 2nd Stage Results with Senior Share Instrument

The table shows 2nd stage of 2SLS IV regressions of *3, 12, 18 and 24-month CD – Money Market (MM) Savings spread* against bank-level *Ln(Total Deposits)* and *Ln(Reserves).* CD and MM Savings rates are sourced from *S&P Global's RateWatch* deposit data. Bank-level variables are sourced from *FDIC's Call Reports* data. *Reserves* are cash and balances due from Federal Reserve Banks at the consolidated bank level (RCFD0090). *Total Deposits* are the sum total of deposits held in domestic and foreign offices (RCON2200 + RCFN2200). Panel A shows the OLS regression. Panel B shows the IV regression with *Ln(Total Deposits)* instrumented with the *Senior Share Instrument* (z^{Dss}_{it}) and *Ln(Reserves)* instrumented with as *Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over previous 4 quarters*. Aggregate Reserves is taken from FRED. Panel A shows the second stage results for the Overall and QE I-III+ Pandemic QE periods. Panel B shows results for QE I-III and Post-QE-III+QT periods. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter along with bank and time fixed effects. Standard errors are two-way clustered at the bank and time level. The sample period is 2001 Q1 – 2021 Q4. * p<0.1, ** p<0.05, *** p<0.01

Panel A: Overall and QE-I-III + Pandemic QE periods

	(1) 3-month CD Rate – MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	0.613	0.618	1.371**	0.603
	(0.580)	(0.544)	(0.626)	(0.552)
Ln(Reserves)	-0.129***	-0.0432	-0.203***	-0.105***
	(0.0331)	(0.0593)	(0.0279)	(0.0263)
N	83926	89623	75105	88276
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4			
	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	-0.0597	0.309	-0.115	0.174
	(0.645)	(0.455)	(0.895)	(0.530)
Ln(Reserves)	-0.179***	-0.0591*	-0.256*	-0.128**
	(0.0499)	(0.0317)	(0.127)	(0.0622)
N	39304	42041	34930	41389
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4			

Panel B: QE-I-III and Post-QE-III+QT periods

	(1)	(2)	(3)	(4)
	3-month CD Rate - MM Savings Rate	12-month CD Rate - MM Savings Rate	18-month CD Rate - MM Savings Rate	24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	0.598	0.649	0.611	0.572
	(0.513)	(0.415)	(0.687)	(0.462)
Ln(Reserves)	-0.177***	-0.0525	-0.250**	-0.128**
	(0.0402)	(0.0328)	(0.116)	(0.0553)
N	34542	36782	30491	36164
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	QE-I-III :2008Q4 - 2014Q3			
	(1)	(2)	(3)	(4)
	3-month CD Rate - MM Savings Rate	12-month CD Rate - MM Savings Rate	18-month CD Rate - MM Savings Rate	24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	-0.579	-0.223	0.465	-0.769
	(1.583)	(1.822)	(1.551)	(1.781)
Ln(Reserves)	0.480	0.0118	-0.254	0.226
	(0.359)	(0.640)	(0.508)	(0.598)
N	21417	23322	19423	23030
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Post-QE-III + QT: 2014Q4 - 2019Q3			

Table B4.1: **Alternative Deposit Instruments – Small Business Administration (SBA) Disaster Assistance Instrument**

The table represents the first-stage regressions in the 2SLS IV regression of Deposit Spreads with the Deposit Instrument replaced with the SBA Disaster Assistance Instrument defined as $z_{it}^{Dsba} = \ln\left(\sum_{z\in Z_{it}} Loss_{zt} \times \frac{Bank\ Zip\ Share_{izt_0}}{\sum_{z\in Z_{it}} Bank\ Zip\ Share_{izt_0}}\right)$, where Z_{it} is the set of all zips bank i has a presence in and t_0 is the earliest year of bank's presence in the zip in the Summary of Deposit sample starting 2000q1. *Loss* is the zip-level perceived loss for which SBA disaster assistance is requested. Bank Zip Share is the ratio of bank i's deposits in zip z to the Total Deposits of the bank. Total Deposits is the sum of Total Domestic and Foreign Deposits held at the depository level (RCON2200+RCFN2200 of Call Reports). Reserves are cash and balances due from Federal Reserve Banks at the consolidated bank-level (RCFD0090 of Call Reports). Reserves instrument is defined as *Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over previous 4 quarters.* Aggregate Reserves is taken from FRED. Columns (1) & (5) represent the regressions on the overall sample ranging 2001 Q1 – 2021 Q4. Columns (2) & (6) represent QE I-III + Pandemic QE of 2008Q4 - 2014Q3 & 2019Q4-2021Q4. Columns (3) & (7) represent the QEI-III period: 2008Q4 - 2014Q3. Columns (4) & (8) show results for the Post-QE III + QT period 2014Q4 - 2019Q3. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter along with bank and time fixed effects. Standard errors are two-way clustered at the bank and time level. * p<0.1, ** p<0.05, ***

	(1) Ln(Total Deposits)	(2) Ln(Total Deposits)	(3) Ln(Total Deposits)	(4) Ln(Total Deposits)	(5) Ln(Reserves)	(6) Ln(Reserves)	(7) Ln(Reserves)	(8) Ln(Reserves)
Growth in Agg Reserves (qoq) X Average Past 4Q Reserve Share	-0.420*	-0.492**	-0.411**	5.591	10.69***	8.794***	8.080***	29.68
	(0.221)	(0.219)	(0.183)	(6.634)	(1.220)	(0.780)	(0.718)	(18.47)
SBA Disaster Assistance Instrument	0.000354*	0.000572*	0.000578*	0.000300	0.000339	-0.00350	-0.00116	-0.00345
	(0.000206)	(0.000293)	(0.000286)	(0.000254)	(0.00191)	(0.00253)	(0.00262)	(0.00202)
Constant	0.529**	1.104***	2.263***	1.180	-1.479*	-0.608	3.085	-2.920**
	(0.231)	(0.371)	(0.445)	(0.782)	(0.886)	(1.232)	(1.819)	(1.314)
N	134028	57998	49628	34683	121876	53388	45453	31355
R-sq	0.973	0.977	0.976	0.994	0.732	0.767	0.757	0.845
F-stat	729.2	367.1	133.1	91.87	39.11	50.26	72.54	20.32
Bank & Time-FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE-I-III :2008Q4 - 2014Q3	Post-QE-III + QT: 2014Q4 - 2019Q3	Overall: 2001Q1-2021Q4	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4	QE-I-III :2008Q4 - 2014Q3	Post-QE-III + QT: 2014Q4 - 2019Q3

p<0.01

Table B4.2: 2nd Stage Results Alternative Deposit Instruments – SBA Disaster Assistance

The table shows 2nd stage of 2SLS IV regressions of *3, 12, 18 and 24-month CD – Money Market (MM) Savings spread* against bank-level *Ln(Total Deposits)* and *Ln(Reserves).* CD and MM Savings rates are sourced from *S&P Global's RateWatch* deposit data. Bank-level variables are sourced from *FDIC's Call Reports* data. *Reserves* are cash and balances due from Federal Reserve Banks at the consolidated bank level (RCFD0090). *Total Deposits* are the sum total of deposits held in domestic and foreign offices (RCON2200 + RCFN2200). Panel A shows the OLS regression. Panel B shows the IV regression with *Ln(Total Deposits)* instrumented with the *SBA Disaster Assistance Instrument* (z^{Dsba}_{it}) and *Ln(Reserves)* instrumented with as *Growth in Aggregate Reserves × Lagged Share in Reserves, averaged over previous 4 quarters*. Aggregate Reserves is taken from FRED. Panel A shows the second stage results for the Overall and QE I-III+ Pandemic QE periods. Panel B shows results for QE I-III and Post-QE-III+QT periods. All specifications control for Log(Assets), Net Income/Assets, Equity/Assets, Primary Dealer indicator lagged by one quarter along with bank and time fixed effects. Standard errors are two-way clustered at the bank and time level. The sample period is 2001 Q1 – 2021 Q4. * p<0.1, ** p<0.05, *** p<0.01

Panel A: Overall and QE-I-III + Pandemic QE periods

	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	-0.653	-1.088	-1.203	-1.183
	(1.780)	(1.863)	(2.311)	(1.909)
Ln(Reserves)	-0.142***	-0.0610	-0.232***	-0.125***
	(0.0358)	(0.0439)	(0.0617)	(0.0277)
N	84015	89712	75186	88365
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Overall: 2001Q1-2021Q4			

	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	-1.778	-0.304	-1.761	-0.288
	(2.404)	(1.552)	(2.511)	(1.658)
Ln(Reserves)	-0.232**	-0.0785	-0.308*	-0.143
	(0.106)	(0.0568)	(0.173)	(0.0885)
N	39351	42088	34975	41436
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	QE-I-III+ Pandemic QE: 2008Q4 - 2014Q3 & 2019Q4 - 2021Q4			

	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	-0.786	0.861	0.446	0.867
	(2.367)	(1.694)	(2.173)	(1.785)
Ln(Reserves)	-0.213**	-0.0474	-0.255*	-0.121*
	(0.0854)	(0.0493)	(0.128)	(0.0686)
N	34582	36822	30529	36204
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	QE-I-III :2008Q4 - 2014Q3			

	(1) 3-month CD Rate - MM Savings Rate	(2) 12-month CD Rate - MM Savings Rate	(3) 18-month CD Rate - MM Savings Rate	(4) 24-month CD Rate - MM Savings Rate
Ln(Total Deposits)	3.188	-3.174	-6.859	-1.246
	(8.675)	(7.409)	(9.620)	(6.655)
Ln(Reserves)	0.422	0.0673	-0.145	0.235
	(0.361)	(0.455)	(0.400)	(0.450)
N	21426	23331	19429	23039
Bank & Time-FE	Y	Y	Y	Y
Bank & Time Clustered SE	Y	Y	Y	Y
Period	Post-QE III + QT: 2014Q3 – 2019Q3			

References

Becker, Bo. "Geographical segmentation of US capital markets." Journal of Financial economics 85, no. 1 (2007): 151-178.

Elliot, G., and M. Jansson (2003) “Testing for unit roots with stationary covariates”, Journal of Econometrics, 2003, vol. 115, issue 1, 75-89
Kleibergen, F. and Paap, R. 2006. Generalized Reduced Rank Tests Using the Singular Value Decomposition. Journal of Econometrics, Vol. 133, pp. 97-126.

Lopez-Salido, David, and Annette Vissing-Jorgensen. "Reserve Demand, Interest Rate Control, and Quantitative Tightening." Interest Rate Control, and Quantitative Tightening (February 27, 2023) (2023).

Staiger, Douglas, and James H. Stock. "Instrumental Variables Regression with Weak Instruments." Econometrica: Journal of the Econometric Society (1997): 557-586.

Stock, James, and Motohiro Yogo. "Asymptotic distributions of instrumental variables statistics with many instruments." Identification and inference for econometric models: Essays in honor of Thomas Rothenberg 6 (2005): 109-120.