Online Appendix for

Private Equity and Financial Stability:

Evidence from Failed-Bank Resolution in the Crisis

Emily Johnston-Ross

FDIC

Song Ma

*Yale University
and NBER*

Manju Puri

*Duke University
and NBER*

Online Appendix A. Sample of Failed Bank Acquisitions and PE Participation

In this appendix, we provide details on the sample construction of failed banks in our main analysis, which focuses on 456 failed bank acquisitions. None of the data processing steps described below change the results of the paper in any meaningful way, either qualitatively or quantitatively.

From 2009 to 2014 (the main dates of our sample, because these are the years in which PE investors acquired failed banks), the cumulative number of failed bank observations is 483. This includes 394 bank failures acquired by banks,[1] 62 bank failures acquired by PE investors,[2] 25 failures that received no winning bid and were thus liquidated by the FDIC, and 2 banks that were temporarily run by the FDIC as bridge banks. The 25 liquidations and 2 bridge banks are excluded from our analysis, leaving 394 + 62 = 456 failed bank acquisitions for our main analysis.

The amount of assets at the failed banks in Figure 1, Panel B shows total assets held at failed banks in the quarter before failure. The sample includes assets at banks that were acquired, liquidated, or temporarily run as a conservatorship or bridge bank. These numbers differ from the total assets *acquired*, depicted in Figure 3, Panel B. Figure 3 only includes assets from banks that were acquired, so it excludes any assets from banks that were liquidated and two bankers' banks that failed and were temporarily run as bridge banks by the FDIC. In addition, acquirers rarely purchase 100% of the assets at the failed bank, so the FDIC retains a large portion overall. Any assets retained by the FDIC in the resolution process are excluded from the measure of assets acquired. This is why the amount of assets at failure and the amount of assets acquired are different between Figure 1, Panel B, and Figure 3, Panel B, in the paper, capturing details of bank failures vs. acquisitions.
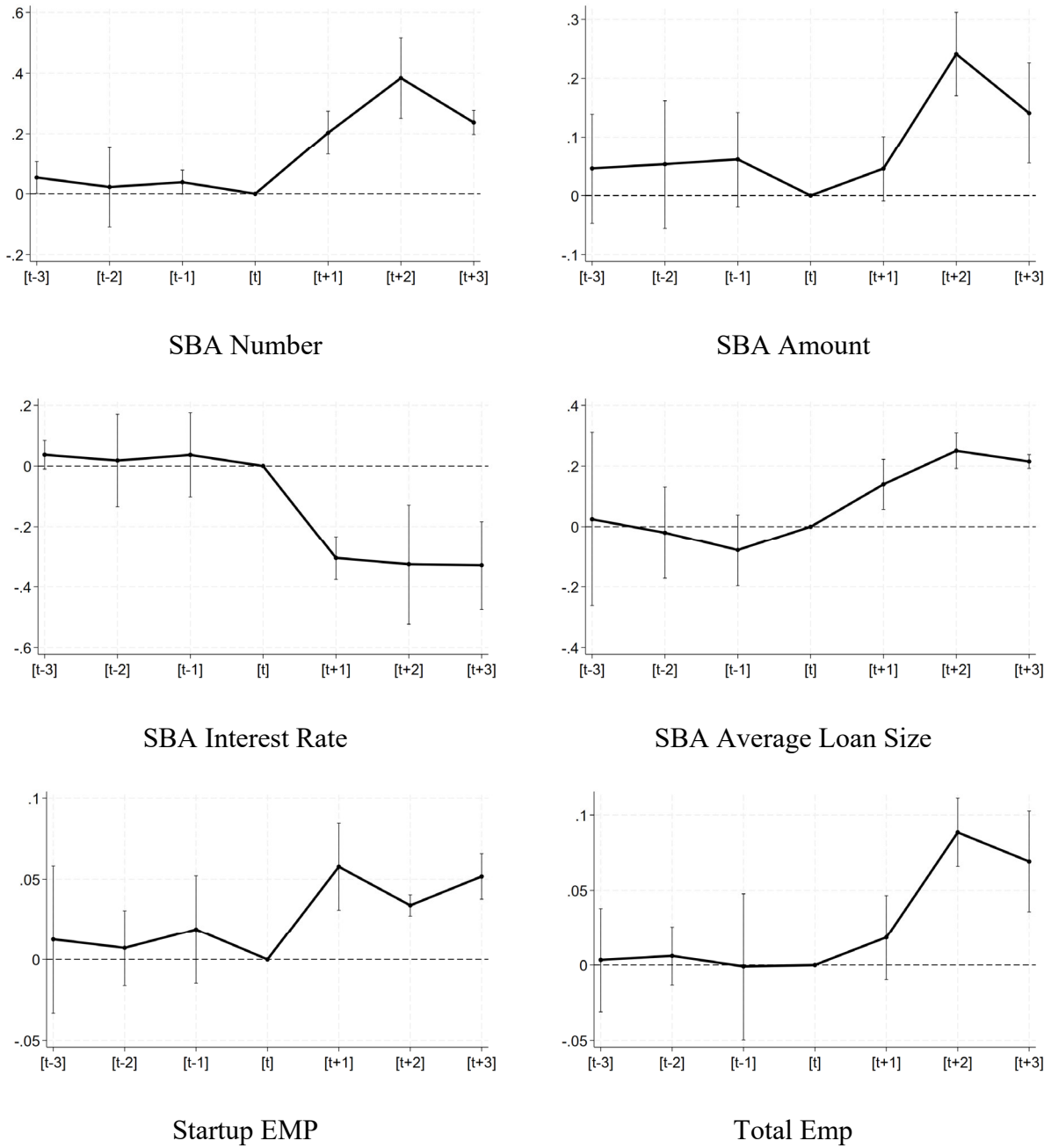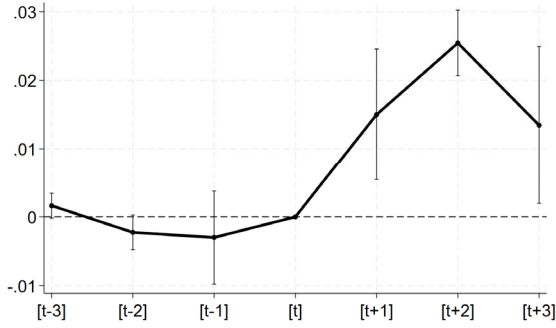
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[1] One bank that failed in 2010 was split between two different acquirers – these are counted as separate observations in our analysis.

[2] One bank failed in 2008 but was run by the FDIC as a conservatorship before being acquired in 2009 by a PE entity.
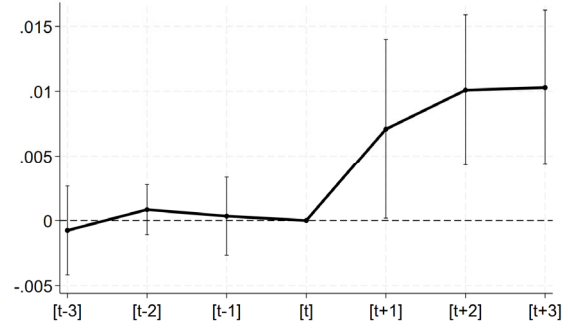
Figure A1. Real County-Level Economic Outcomes around Failed-Bank Acquisitions

SBA Number

SBA Amount

SBA Interest Rate

SBA Average Loan Size

Startup EMP

Total Emp

Total Income   Per Capita Income

This figure presents the dynamics in real economic activities in the years around failed-bank acquisitions. We employ the quasi-random sample as in Tables VIII and IX of the paper and use the outcome variables defined therein. The unit of observation is at the bank(i)-year(t) level. The coefficients and 95% confidence intervals are estimated from the following specification:

$$Outcome_{i,t} = \sum_{k=-3 \, to \, 3} \lambda_k \, d[t+k]_{i,t} + \sum_{k=-3 \, to \, 3} \beta_k \, d[t+k]_{i,t} \times I(PEAcquired) + FE + \varepsilon.$$

The dummy variable d[t + k] is equal to one if the observation is k years from failure/acquisition, and zero otherwise. We plot the β_k coefficients, which are the estimates representing the differences in trends in economic activities between the PE-acquired and bank-acquired failed banks in our quasi-random sample. Fixed effects and standard errors follow those in Tables VIII and IX of the paper.

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Table AI. Bank Failures and PE Participation in Resolutions

This table shows the number and size of failed bank acquisitions by year. Column (1) is the year in which the acquisition occurred. Column (2) is the total number of failed bank acquisitions in a given year. Column (3) is the total amount of failed bank assets in millions acquired in a given year from internal resolution data at the FDIC. Column (4) is the number of failed banks acquired by PE in a given year. Column (5) is the percentage of failed bank acquisitions by PE in a given year relative to the total failed bank acquisitions that year. Column (6) is the total assets in millions passed to the acquiring banks in a given year from internal FDIC resolutions data. Column (7) is the percentage of assets acquired by PE in a given year relative to total assets acquired in that year. Column (8) is the number of failed banks acquired by banks in a given year. Column (9) is the percentage of failed bank acquisitions by banks in a given year relative to the total failed bank acquisitions that year. Column (10) is the total assets passed to the bank acquirers in a given year from internal FDIC resolutions data. Column (11) is the percentage of assets acquired by banks in a given year relative to total assets acquired in that year.

| Year | Total failed bank acquisitions | | Failed banks acquired by PE | | | | Failed banks acquired by other banks | | | |
	Number	Total assets ($Million)	Number	%	Total assets ($Million)	%	Number	%	Total assets ($Million)	%
2009	129	151,605	11	8.53%	38,181	25.18%	118	91.47%	113,423	74.82%
2010	149	79,620	22	14.67%	15,847	19.90%	127	85.33%	63,774	80.10%
2011	90	31,888	20	22.22%	10,240	32.11%	70	77.78%	21,648	67.89%
2012	47	8,723	5	10.64%	1,149	13.17%	42	89.36%	7,574	86.83%
2013	23	4,794	2	8.70%	363	7.57%	21	91.30%	4,431	93.43%
2014	18	2,173	2	11.11%	210	9.68%	16	88.89%	1,963	90.32%
Overall	456	278,803	62	13%	65,990	24 %	394	87%	212,813	76 %

Table AII. Summary Statistics of the Failed Banks

This table presents summary statistics for failed bank acquisitions by PE and other banks between 2009 and 2014. *Asset size* is the amount of assets at the failed bank in millions. *% Tier 1 risk-based capital* is the Tier 1 risk-based capital divided by adjusted average assets, as a percentage. *Liquidity ratio* is the sum of cash, fed funds sold, and securities (excluding mortgage-backed securities) divided by total assets. *Core deposits to total deposits* is total domestic deposits minus time deposits of more than $250,000 and brokered deposits of $250,000 or less divided by total deposits. *CRE loans to total loans* is non-farm, non-residential properties secured by real estate and multifamily (5 or more) residential properties secured by real estate divided by total loans. *C&D loans to total loans* is construction and land development loans secured by real estate divided by total loans. *C&I loans to total loans* is commercial and industrial loans divided by total loans. *Consumer loans to total loans* is loans to individuals for household, family, and other personal expenditures divided by total loans. *Noncurrent loans to total loans* is the ratio of noncurrent loans to total loans. *OREO to total assets* is the ratio of other real estate owned to total assets. *Loss-sharing agreement* is an indicator variable that equals 1 if the transaction included an agreement with the FDIC to share in a portion of the losses on covered assets and 0 if no loss-sharing agreement was included. Neighboring bank variables are constructed as the mean of banks that share at least one branch zip code with the focal bank.

| | PE Acquisitions | | | | Bank Acquisitions | | | | T-test | |
	N	Mean	Standard Deviation	Median	N	Mean	Standard Deviation	Median	*t*-stat	*p-val*
Failed bank characteristics										
Asset size ($ millions)	62	1,354	4,216	341	394	628	1,890	193	-2.267**	0.024
% Tier 1 risk-based capital ratio	62	0.165	2.418	0.615	394	1.045	2.722	1.190	2.402**	0.017
Liquidity ratio	62	0.168	0.085	0.156	394	0.168	0.081	0.156	0.030	0.976
Core deposits to total deposits	62	0.824	0.148	0.889	394	0.839	0.144	0.874	0.753	0.452
Net interest margin (%)	62	2.019	1.320	2.115	394	2.634	1.217	2.625	3.655***	0.001
CRE loans to total loans	62	0.400	0.165	0.394	394	0.385	0.171	0.378	-0.649	0.516
C&D loans to total loans	62	0.227	0.149	0.199	394	0.179	0.135	0.152	-2.571**	0.011
C&I loans to total loans	62	0.083	0.080	0.065	394	0.111	0.090	0.085	2.284**	0.023
Consumer loans to total loans	62	0.014	0.013	0.010	394	0.024	0.042	0.012	1.842*	0.066
Residential loans to total loans	62	0.253	0.184	0.209	394	0.260	0.184	0.237	0.303	0.762
Noncurrent loans to total loans	62	0.183	0.088	0.162	394	0.161	0.096	0.143	-1.716*	0.087
OREO to total assets	62	0.065	0.057	0.051	394	0.050	0.047	0.037	-2.386**	0.017
Loss-sharing agreement	62	0.839	0.371	1	394	0.632	0.483	1	-3.224***	0.001
Neighboring bank conditions										
Neighbor % tier 1 risk-based capital ratio	62	7.692	1.274	7.713	394	7.972	1.345	7.956	-1.479	0.140
Neighbor noncurrent loans to total loans	62	0.048	0.041	0.038	394	0.034	0.033	0.022	2.870***	0.004
Neighbor OREO to total assets	62	0.012	0.013	0.006	394	0.006	0.009	0.003	4.106***	0.000
No. of Local Banks (>3xSize)	62	2.949	1.682	2.000	394	3.337	2.178	3.000	-1.300	0.194
No. of Failed Banks in State	62	52.9	29.4	69	394	35.0	27.9	21	17.9***	0.000

Table AIII. Comparison of PE and Bank Buyers' Bidder Behaviors

This table presents the correlation of failed-bank characteristics of the key regression sample in Table III, and the variables are all defined in Table AII.

	(1)	(2)	(3)	(4)	(5)
(1) % Tier 1 risk-based capital ratio	1.000				
(2) Core deposits to total deposits	-0.080	1.000			
(3) Net interest margin (%)	0.183	0.333	1.000		
(4) C&D loans to total loans	-0.087	-0.202	-0.516	1.000	
(5) OREO to total assets	-0.105	0.172	-0.141	0.204	1.000

Table AIV. Robustness: Comparing PE-Acquired and Bank-Acquired Failed Banks

This table presents the estimation results from a logit regression framework in the following form:

$$Pr(PE = 1) = \Phi(\alpha + \beta \cdot X_i + \gamma \cdot Control_i + \theta_t + \varepsilon_i).$$

The analysis is performed on the cross-sectional sample of all failed banks that eventually got acquired by a bank or a private equity investor. The dependent variable is a dummy that takes value 1 if the failed bank was eventually acquired by a PE investor and 0 otherwise (i.e., acquired by a bank). This table differs from Table III of the paper by using alternative definitions of PE acquisitions. We required PE holding to be above 75% or 66% respectively.

Panel A: PE Defined as PE Ownership > 75%

	(1)	(2)	(3)	(4)	(5)
	Pr(PE Acquired); PE defined as PE Ownership > 75%				
% Tier 1 risk-based capital ratio	-0.011**				
	(-2.183)				
Core deposits to total deposits		-0.268**			
		(-2.073)			
Net interest margin (%)			-0.075***		
			(-4.657)		
C&D loans to total loans				0.347**	
				(2.480)	
OREO to total assets					0.728***
					(2.654)
Log(asset in $000)	0.052***	0.048***	0.043***	0.043***	0.054***
	(4.099)	(3.931)	(3.587)	(2.807)	(4.260)
Observations	408	408	408	408	408
Failed Year-Quarter FE	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.131	0.132	0.204	0.148	0.138

Panel B: PE Defined as PE Ownership > 66%

	(1)	(2)	(3)	(4)	(5)
	Pr(PE Acquired); PE defined as PE Ownership > 66%				
% Tier 1 risk-based capital ratio	-0.012**				
	(-2.300)				
Core deposits to total deposits		-0.248*			
		(-1.858)			
Net interest margin (%)			-0.082***		
			(-4.849)		
C&D loans to total loans				0.365**	
				(2.512)	
OREO to total assets					0.866***
					(3.262)
Log(asset in $000)	0.060***	0.056***	0.050***	0.050***	0.061***
	(4.554)	(4.391)	(4.090)	(3.271)	(4.770)
Observations	428	428	428	428	428
Failed Year-Quarter FE	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.156	0.152	0.229	0.171	0.169

Table AV. Robustness: Comparing PE-Acquired and Bank-Acquired Failed Banks

This table presents the estimation results from a logit regression framework in the following form:

$$Pr(PE = 1) = \Phi(\alpha + \beta \cdot X_i + \gamma \cdot Control_i + \theta_t + \varepsilon_i).$$

The analysis is performed on the cross-sectional sample of all failed banks that eventually got acquired by a bank or a private equity investor. The dependent variable is a dummy that takes value 1 if the failed bank was eventually acquired by a PE investor and 0 otherwise (i.e., acquired by a bank). This table differs from Table III of the paper by simultaneously incorporating bank characteristics of the failed banks and their neighboring banks, as defined in the paper.

	(1)	(2)	(3)	(4)	(5)
			I(PE Acquired)		
% Tier 1 risk-based capital ratio	-0.017***				
	(0.005)				
Neighbor % tier 1 risk-based capital ratio	-0.018*				
	(0.011)				
Core deposits to total deposits		-0.591**			
		(0.254)			
Neighbor core deposits to total deposits		-0.401*			
		(0.217)			
Net interest margin (%)			-0.073***		
			(0.021)		
Neighbor net interest margin (%)			-0.012		
			(0.041)		
C&D loans to total loans				0.309***	
				(0.101)	
Neighbor C&D loans to total loans				0.324**	
				(0.147)	
OREO to total assets					0.492**
					(0.234)
Neighbor OREO to total assets					3.397**
					(1.444)
Log(asset in $000)	0.064***	0.029*	0.027**	0.025**	0.060***
	(0.012)	(0.018)	(0.011)	(0.010)	(0.012)
Observations	456	456	456	456	456
Failed Year-Quarter FE	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.198	0.118	0.141	0.0951	0.196

Table AVI. Comparison of PE and Bank Buyers' Bidder Behaviors

This table presents the characteristics of bidding activities by PE bidders and bank bidders. We present the mean and standard deviation for each category, and the *t*-stat comparing the mean. Three sets of characteristics are studied: bidder activities in total, characteristics of the offers when bidding, and the characteristics of auctions that they choose to participate. *Total submitted bids* is the number of bids placed by the bidder across all participating auctions. *Total auctions bid on* is the number of auctions in which the bidder placed a bid. *Average bids submitted per auction* is the average number of bids placed per participating auction. *Number of bids below liquidation value* is the average number of bids from the bidder across all participating auctions that fell below the estimated liquidation value of the failed bank, per the FDIC's least cost test. *Number of bids with difference compared to winning bids < 5% of total assets* is the number of bids across all bidders in participating auction that are valued within a difference from the winning bid of 5% of total failed bank assets. *Number of bids below liquidation value (as pct of total bids in auction)* is the average number of bids across all bidders in participating auction that fell below the estimated liquidation value of the failed bank, per the FDIC's least cost test. *Number of bids with difference compared to winning bids < 5% of total assets (as pct of total bids in auction)* is the number of bids across all bidders in participating auction that are valued within a difference from the winning bid of 5% of total failed bank assets, as a percentage of total bids in the auction. *Total bids below liquidation value (as pct of total bids by bidder)* is the average number of bids below liquidation value by participating bidder per participating auction. *Total bids with difference compared to winning bids < 5% of total assets (as pct of total bids by bidder)* is the number of bids by participating bidder in participating auction that are valued within a difference from the winning bid of 5% of total failed bank assets, as a percentage of total bids placed by participating bidder in participating auction. *Total number of bids* is the total number of bids placed across all bidders in participating auction. *Total number of bidders* is the total number of bidders in participating auction. *Number of bank bids* is the total number of bids placed across all bank bidders in participating auction. *Number of bank bidders* is the total number of participating banks in participating auction. *Number of PE bids* is the total number of bids placed across all PE bidders in participating auction. *Number of PE bidders* is the total number of participating PE consortia in participating auction. *Percent of auctions with no viable cover bid* is the number of participating auctions in which there was no runner-up bid valued above the liquidation value of the failed bank.

	PE Bidders		Bank Bidders		
	Mean	Standard Deviation	Mean	Standard Deviation	*t*-stat
Bidder Activity in Total					
Total submitted bids	10.520	9.019	4.767	8.055	-3.454***
Total auctions bid on	5.120	4.576	2.769	4.944	-2.323**
Average bids submitted per auction	2.241	1.366	1.688	1.000	-2.633**
Bidder Offers by Participating Auction					
Number of bids below liquidation value	0.784	0.928	1.429	1.725	1.852*
Number of bids with difference compared to winning bids < 5% of total assets	3.916	2.463	3.115	2.808	-1.396
Number of bids below liquidation value (as pct of total bids in auction)	0.129	0.182	0.219	0.230	1.918*
Number of bids with difference compared to winning bids < 5% of	0.549	0.306	0.439	0.301	-1.777*

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total assets (as pct of total bids in auction)					
Total bids below liquidation value (as pct of total bids by bidder)	0.116	0.246	0.237	0.346	1.717*
Total bids with difference compared to winning bids < 5% of total assets (as pct of total bids by bidder)	0.408	0.319	0.276	0.346	-1.864*
Characteristics of Auctions Participated					
Total number of bids	7.007	2.913	6.768	3.630	-0.323
Total number of bidders	3.394	1.093	4.064	1.825	1.814*
Number of bank bids	3.533	2.259	6.511	3.573	4.120***
Number of bank bidders	1.991	1.051	3.934	1.842	5.223***
Number of PE bids	3.474	1.875	0.257	0.736	-18.806***
Number of PE bidders	1.403	0.359	0.129	0.319	-19.288***
Percent of auctions with no viable cover bid	0.180	0.326	0.210	0.355	0.415

Table AVII. Tests with Alternative Quasi-Random Samples

This table extends the analysis in Tables VI and VII in the paper to another quasi-random sample. Specifically, the quasi-random sample is expanded to include deals in which the difference between the winning bid and the cover bid are within 10% (instead of the 5% as in the main analysis).

	(1)	(2)	(3)	(4)
	Closing	Close and Exit from County	1-Yr ΔDeposit	3-Yr ΔDeposit
I(PE Acquired)	-0.115***	-0.038**	0.025	0.268**
	(0.031)	(0.015)	(0.021)	(0.095)
Observations	826	826	765	765
R-squared	0.299	0.182	0.537	0.583
State x Failed Year FE	Yes	Yes	Yes	Yes

Table AVIII. Robustness: Post-Acquisition Performance with Alternative Standard Errors

This table shows the robustness of results in Tables VI and VII using different methods to cluster standard errors. Panel A presents clustering at acquirer level. Panel B presents standard errors computed using wild bootstrapping.

Panel A: Acquirer-Level S.E. Clustering

| | **Quasi-Random Sample** | | **Quasi-Random Sample** | |
| | (1) | (2) | (1) | (1) |
	Closing	Close and Exit from County	1-Yr ΔDeposit	1-Yr ΔDeposit
I(PE Acquired)	-0.148***	-0.070***	-0.018	0.356***
	(0.029)	(0.021)	(0.120)	(0.083)
Observations	617	617	431	431
R-squared	0.345	0.234	0.594	0.611
Acquirer FE	Yes	Yes	Yes	Yes
Mean of Dependent Var	0.201	0.117	0.0627	-0.0288

Panel B: Post-Acquisition Performance: Wild Bootstrapping S.E.

| | **Quasi-Random Sample** | | **Quasi-Random Sample** | |
| | (1) | (2) | (1) | (1) |
	Closing	Close and Exit from County	1-Yr ΔDeposit	1-Yr ΔDeposit
I(PE Acquired)	-0.148***	-0.070**	-0.018	0.356***
	(0.032)	(0.024)	(0.127)	(0.097)
Observations	617	617	431	431
R-squared	0.345	0.234	0.594	0.611
Mean of Dependent Var	0.201	0.117	0.0627	-0.0288

Table AIX. Branch Closing Post Failed-Bank Acquisition—Branch-level Regression

This table extends the analysis of Table VI—the key difference is that the coding the branch closing indicator excludes the type of closures with close-by branches documented in the Benson, Blattner, Grundl, Kim, and Onishi (2021).

	Quasi-Random Sample	**Full Sample**
	(1)	(2)
	Closing without Nearby Branches	Closing without Nearby Branches
I(PE Acquired)	-0.137***	-0.068**
	(0.040)	(0.028)
Observations	617	4,476
R-squared	0.341	0.232
State x Failed Year FE	Yes	Yes
Mean of Dependent Var	0.188	0.103

Table AX. Small Business Lending at the Bank-County Level

This table reproduces the analysis in Table IX using a bank-location (county) sample, instead of county-level.

	(1) ΔSBA Number	(2) ΔSBA Amount	(3) ΔSBA Interest Rate	(4) ΔSBA Average Loan Size
I(PE Acquired)	0.232**	0.098***	-0.134**	0.107
	(0.103)	(0.032)	(0.060)	(0.099)
Observations	9,732	9,732	9,732	9,732
R-squared	0.659	0.783	0.613	0.376
State x Year FE	Yes	Yes	Yes	Yes

Table AXI. CRA Lending Changes After Acquisition

This table shows changes in CRA lending after failed-bank acquisition. Panel A compares the changes in CRA lending for PE-acquirers relative to all other local lenders within the acquirer's state footprint (excluding bank-acquirers). Panel B shows the same for bank-acquirers relative to all other local lenders within the acquirer's footprint (excluding PE-acquirers). Panel C directly compares the changes in CRA lending for PE- and bank-acquirers. The CRA data is sourced from the Federal Reserve's CRA Merged Data Tables: https://www.federalreserve.gov/consumerscommunities/data_tables.htm. We use state-level CRA loan originations by bank by year, as a ratio of the total number of the bank's in-state branches to account for additional failed bank acquisitions during this period.

Panel A: PE-Acquirers' CRA Lending Behavior After Acquisition and to Local Average

	1-yr change post acquisition			2-yr change post acquisition			3-yr change post acquisition		
	Mean	St.d.	*t-test*	Mean	St.d.	*t-test*	Mean	St.d.	*t-test*
PE-acquirers	0.494	0.067	0.000	0.871	0.089	0.000	1.309	0.127	0.000
Local lenders	0.093	0.008		0.273	0.016		0.386	0.023	

Panel B: Bank-Acquirers' CRA Lending Behavior After Acquisition and Local Average

	1-yr change post acquisition			2-yr change post acquisition			3-yr change post acquisition		
	Mean	St.d.	*t-test*	Mean	St.d.	*t-test*	Mean	St.d.	*t-test*
Bank-acquirers	0.218	0.021	0.000	0.306	0.028	0.319	0.540	0.044	0.001
Local lenders	0.100	0.009		0.273	0.016		0.386	0.023	

Panel C: PE-Acquirers' CRA Lending Behavior After Acquisition and to Local Average

	1-yr change post acquisition			2-yr change post acquisition			3-yr change post acquisition		
	Mean	St.d.	*t-test*	Mean	St.d.	*t-test*	Mean	St.d.	*t-test*
PE-acquirers	0.494	0.067	0.002	0.871	0.089	0.000	1.309	0.127	0.000
Bank-acquirers	0.222	0.021		0.267	0.024		0.590	0.050	

Table AXII. Loan Portfolio Changes After Acquisitions of Failed Banks

This table shows the change in lending portfolio composition for PE- and bank-acquirers in the first three years post acquisition. These numbers are obtained from Call Reports at the distinct acquirer-level, starting at acquisition time t=0. T-statistics are reported to indicate whether the acquirer-type experienced significant changes in lending composition over that horizon. Observations are measured at 1, 2, and 3 year intervals relative to the portfolio composition at the time of acquisition.

Panel A: PE-Acquired banks' Lending Behavior After Acquisition (n=20)

	At acquisition		1 yr post acquisition		t=(0,1)	2 yr post acquisition		t=(0,2)	3 yr post acquisition		t=(0,3)
	Mean	St.d.	Mean	St.d.	t-stat	Mean	St.d.	t-stat	Mean	St.d.	t-stat
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Residential loans to total loans	0.297	0.251	0.306	0.214	-0.110	0.264	0.179	0.463	0.250	0.163	0.666
CRE loans to total loans	0.337	0.190	0.375	0.169	-0.638	0.417	0.182	-1.304	0.407	0.177	-1.151
C&D loans to total loans	0.192	0.137	0.131	0.083	1.635	0.091	0.071	2.732***	0.086	0.073	2.862***
C&I loans to total loans	0.113	0.081	0.139	0.112	-0.804	0.181	0.164	-1.631	0.205	0.192	-1.949*
Consumer loans to total loans	0.025	0.044	0.021	0.031	0.379	0.018	0.025	0.583	0.019	0.035	0.498
Loan commitments to total loans	0.057	0.047	0.063	0.051	-0.337	0.096	0.065	-2.062**	0.124	0.074	-3.284***

Panel B: BankAcquired Banks' Lending Behavior After Acquisition (n=225)

	At acquisition		1 yr post acquisition		t=(0,1)	2 yr post acquisition		t=(0,2)	3 yr post acquisition		t=(0,3)
	Mean	St.d.	Mean	St.d.	t-stat	Mean	St.d.	t-stat	Mean	St.d.	t-stat
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Residential loans to total loans	0.251	0.143	0.251	0.144	-0.029	0.245	0.144	0.393	0.240	0.141	0.818
CRE loans to total loans	0.379	0.161	0.388	0.163	-0.547	0.394	0.168	-0.937	0.396	0.176	-1.020
C&D loans to total loans	0.095	0.065	0.081	0.053	2.571***	0.072	0.051	4.144***	0.064	0.049	5.501***
C&I loans to total loans	0.150	0.086	0.154	0.093	-0.506	0.157	0.097	-0.890	0.161	0.101	-1.316
Consumer loans to total loans	0.047	0.062	0.044	0.058	0.568	0.043	0.059	0.626	0.049	0.089	-0.337
Loan commitments to total loans	0.120	0.074	0.123	0.075	-0.541	0.131	0.089	-1.535	0.145	0.117	-2.783***

Table AXIII. Cost Efficiency of Failed Banks and Spillovers to Local Banks

This table studies the cost efficiency of failed bank branches and their neighboring bank branches after the acquisitions of failed banks. Cost efficiency is calculated using Call Reports, as the ratio of noninterest expenses to total (noninterest plus interest) income; a lower value indicates greater efficiency. Column (1) compares branches of failed banks; column (2) compares neighboring branches of failed banks defined as those in the same county as the failed banks. The failed-bank samples are the quasi-random sample as used in the paper.

| | Failed Banks | Spillover Effect |
| | (1) | (2) |
	ΔCost Efficiency (pp)	ΔCost Efficiency (pp)
I(PE Acquired)	-8.519***	-3.385*
	(2.571)	(1.916)
Observations	564	6,583
R-squared	0.282	0.157
State x Failed Year FE	Yes	Yes
Mean of Dependent Var	60.548	54.215

Online Appendix C. Decomposing the Sources of PE Value-Adding

In this appendix, we examine the sources of the performance improvements, especially the deposit increase, post acquisitions of failed banks by PE investors. The overall structure of the analysis follows Egan, Lewellen, and Sunderam (2022, hereafter ELS)[3] closely. We first provide additional analysis on the major operational channels proposed in ELS, that is, deposit rate analysis and branch service analysis. We then adopt a similar approach as in ELS (2022) and decompose the sources of deposit gains from pricing, from branch services, and from productivity using a back-of-the-envelope calculation. Our headline decomposition numbers are: 45% of the change can be attributed to the pricing effect from interest rates; 10% can be attributed to the maintained branch network and services; and another 45% can be attributed to the increase in productivity.

Post-Acquisition Changes in Deposit Rates, Branch Services, and Deposit Market Share

We first use our quasi-random framework to study the operational changes on deposit rate and branch services. These are the two directly measurable characteristics of bank operations in the ELS framework.

For *deposit rate*, we follow Drechsler, Savov, and Schnabl (2017, QJE) and use the Ratewatch Data. Ratewatch collects weekly branch-level data on deposit rates by product. The data cover 54% of all U.S. branches as of 2013. We merge Ratewatch with FDIC branch-level data using the FDIC branch identifier. For our purpose, we keep both branches that actively set deposit rates and those rate takers, although the results are not sensitive to this choice. The data contain deposit rates on new accounts by product. Following Drechsler, Savov, and Schnabl (2017), we focus on the two most commonly offered deposit products across all U.S. branches, money market deposit accounts with an account size of $25,000 ($25K money market accounts) and 12-month certificates of deposit with an account size of $10,000 ($10K 12-month CDs).

Table AXIV shows the result. Observations, as in the deposit studies, are aggregated to country-level (instead of branch-level) through averaging using branch deposits as weights. We find that post-acquisition, PE-acquired bank branches offered higher rates compared to bank-acquired ones, and the economic magnitude is roughly 10 basis points in the quasi-random analysis and 9 basis

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points in the full sample. This suggests that the operational performance in terms of deposit increase could be partially due to the better deposit rates offered by PE-acquired banks.

Table AXIV. Post-Acquisition Deposit Rates

	Quasi-Random Sample	Full Sample
	(1)	(2)
	Deposit Rate (pp)	Deposit Rate (pp)
I(PE Acquired)	0.097**	0.090***
	(0.039)	(0.021)
Observations	347	1,025
R-squared	0.515	0.462
State x Failed Year FE	Yes	Yes
Mean of Dependent Var	1.157	1.108

For *bank branch services*, we want to highlight our result on the branch closure dimension (Table VI in the paper), for which we show that PE-acquired banks are less likely to close branches, even accounting for the possibility of consolidation. As ELS argues, number of branches is an important input in deposit generation, suggesting this dimension can be another factor affecting diverging deposit performance between PE-acquired and bank-acquired failed banks.

At last, we add an additional outcome variable on deposits—the *market share of deposits*—which will allow us to directly connect to the ELS estimation later. We show the results below in Table AXV, which is very much consistent with our deposit growth result. We find that the growth in deposit share of a PE-acquired failed bank in a local region is 3.8-4.5 percentage points higher depending on the model setup.

Table AXV. Post-Acquisition Deposit Shares

	Quasi-Random Sample	Full Sample
	(1)	(2)
	3-Yr ΔDeposit Share in Local Market	
I(PE Acquired)	0.038***	0.045**
	(0.009)	(0.018)
Observations	431	1,685
R-squared	0.543	0.585
State x Failed Year FE	Yes	Yes

Overall, this first set of analysis provides additional reduced-form evidence confirming deposit increase post PE-acquisitions. The evidence also suggests that this increase could be partially attributed to both higher deposit rates and maintained branch services. The high deposit rate may be interpreted as a sign of poor competitiveness of the bank (they have to compete harder to maintain deposits), yet the increased deposit share suggests against this alternative interpretation. As will be shown below, our preferred interpretation is that increased deposit productivity allows PE-acquired banks to increase deposit rates and improve deposit shares.

Decomposition of the Deposit Improvement Following ELS (2022)

Next, we employ the ELS framework to decompose the source of deposit increase. ELS conducts two main analyses. The first set, which is also the one that is more relevant to our goal, is the estimation of the deposit demand system, which allows us to understand the source of deposit increase. In this estimation, the demand for deposits is a function of deposit rates, branch services, and the productivity of the bank in attracting deposits. The second set of ELS analyses—less relevant to us—analyzes bank value for publicly traded banks, in terms of market to book ratio and equity value, and these are not the relevant sample and question for our setting.

In the ELS framework, the demand system is written as

$$\ln s_{jt} = \alpha \cdot i_{jt} + \beta X_{jt} + \underbrace{\mu_j + \xi_{jt}}_{\delta_{jt}} + \mu_t. \qquad (1)$$

The deposit demand s_{jt}, measured with market shares of a bank j, is a function of the deposit rate i_{jt}, the branch service X_{jt} (measured using number of branches and employees), and the unobserved deposit productivity δ_{jt} (the ability to attract deposit given other observed parameters)—combining a time-invariant component μ_j and a time-variant component ξ_{jt}.

To address the standard issue in demand estimation that the prices (interest rates) are endogenous, the ELS estimation uses two instruments. The first instrument is the bank-specific pass-through of 3-month LIBOR into deposit rates. The second set of instruments are traditional Berry, Levinsohn, and Pakes (1995) type instruments. In this case, it is the average product

characteristics of a bank's competition. These two sets of instruments allow for the estimation of coefficients in model (1) above. Detailed discussions on the construction and validity of the instruments can found in the ELS paper and its appendix.

We directly adapt the estimated parameters from the ELS Table 2, which presents the demand function of deposits. The results are reproduced in the figure below for easy reference. Even though we were hoping to perform the estimations ourselves using our own failed-bank sample, there are several data limitations, including small sample size, short sample period, the ability to track unique branches in estimation, etc., that make it more reasonable to directly adopt the original ELS estimates. As a result, all the results we present should have this caveat in mind.

Reproduced Table 2 from Egan, Lewellen, and Sunderam (2022, RFS)

Table 2
Deposit demand

	(1)	(2)
Deposit rate	12.66***	17.85***
	(1.841)	(4.318)
No. branches (hundreds)	0.0404***	0.0426***
	(0.00931)	(0.00942)
No. empl (thousands)	0.0267***	0.0271***
	(0.00812)	(0.00830)
Nonint. exp. (billions)	−0.0813	−0.102
	(0.1000)	(0.103)
Time fixed effects	X	X
Bank fixed effects	X	X
IV-1		X
IV-2		X
Observations	25,845	25,845
R-squared	.982	.982

The table displays the results corresponding to our demand estimates (Equation (6)). The unit of observation is at the bank by quarter level. The key independent variable of interest is the deposit rate offered for each bank. We measure the deposit rate as the bank's total quarterly net of fee deposit interest expense (scaled by 4) divided by the bank's level of deposits. Because of the potential endogeneity of the deposit rate, we instrument for the deposit rate using two sets of instruments. We construct our first instrument set (IV-1) as the estimated deposit rate from a bank-specific pass-through regression of deposit rates on 3-month LIBOR. We construct our second instrument set (IV-2) as the average of the product characteristics offered by a bank's competitors in the previous quarter (branches, employees, noninterest expense, and fees) as described in the text. We winsorize all independent variables at the 1% level to help control for outliers in the sample. Standard errors are clustered by bank and are reported in parentheses. *$p <.1$; **$p <.05$; ***$p <.01$.

We use column (2) in the ELS Table 2 for a back of the envelope calculation. We assume the stable demand function as in the ELS function. We take the first difference of a post-acquisition version of the function (at $t + 3$) and that of the acquisition time t, leading to

$$\Delta \ln s_{j,t \to t+3} = \alpha \cdot \Delta i_{j,t \to t+3} + \beta \Delta X_{j,t \to t+3}$$
$$+ + \mu_{t \to t+3}. \tag{2}$$

The left-hand-side, $\Delta \ln s_{j,t \to t+3}$, is the difference of deposit performance among PE-acquired and bank-acquired failed banks, as show in Table R2.4. This difference is then decomposed to (i) differences of deposit rate (as studied in Table R2.3), (ii) differences of branch network and services (Table VI in the paper), and (iii) differences in deposit productivity (δ_{jt}, unobserved).

In this framework, the number 3.8% higher deposit growth between PE-acquired and bank-acquired branches is driven by interest rate changes—$\alpha \cdot \Delta i_{j,t \to t+3} = 17.85 \times 0.097\% = 1.73\%$; by branch network changes—$\beta \Delta X_{j,t \to t+3} = 0.4\%$. The remaining unexplained difference is roughly 1.7%. This means, the majority of deposit growth can be explained by the δ_{jt} parameter capturing productivity changes and the deposit interest rate differences.

It is useful to acknowledge, however, that this estimate masks the possibility of changes in the local market environment, etc. which could have changed the demand situation, which in turn may get into the productivity components. Re-estimating is beyond the scope of this paper and is limited by the nature of the data in our setting, but we want to cautiously interpret the magnitudes.