

THE DEPOSITS CHANNEL REVISITED

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Online Appendix

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A DETAILS ON LERNER INDEX

The Lerner index is computed as the difference between price of bank production and marginal cost, divided by marginal cost. We estimate the annual level lerner index for each bank using Call Reports data and following the methodology used by Berger and Roman (2015). The average price of bank production is proxied by the ratio of total revenues (riad4079 + riad4107) to total assets (rcon2170). The marginal cost is calculated by estimating a translog cost function with one output and three input prices. The input prices include the price of labor proxied by the ratio of expenditures on salaries (riad4135) to total assets, the price of other operating and administrative expenses proxied by price of fixed assets (riad4217) to total assets, and the the price of borrowed funds proxied by the ratio of Interest expenses on deposits (riad4170) to total deposits (rcfd2200). Total cost is the sum of the three input prices.

The cost function is specified as follows:

$$\begin{aligned} \log(TC_{it}) = & \alpha_0 + \alpha_1 \log(y_{it}) + 0.5\alpha_2 (\log(y_{it}))^2 + \sum_{j=1}^3 \beta_j \log(w_{j,it}) \\ & + \sum_{j=1}^3 \sum_{k=1}^3 \beta_{jk} \log(w_{j,it}) * \log(w_{k,it}) + \sum_{j=1}^3 \gamma_j \log(y_{it}) * \log(w_{j,it}) + \rho_t + \eta_i + \epsilon_{it} \end{aligned} \quad (\text{A.1})$$

where TC is the output price, y is total assets and $\sum_{j=1}^3 w_j$ are the three input prices. Time fixed effects and bank fixed effects are included. As is common in the literature, symmetry and linear homogeneity restrictions are imposed on input prices. Marginal cost can then be calculated from the estimated coefficients:

$$MC = (TC/y) * (\alpha_1 + \alpha_2 \log(y) + \sum_{j=1}^3 \log(w_j)) \quad (\text{A.2})$$

The resulting Lerner index, calculated as (P-MC)/MC, is a bank-level measure of market power, with a value of 0 representing a perfectly competitive bank (P=MC) and a value of 1 representing a pure monopolist.

B TABLES

Table B.1: Data Summary.

| Name | Description |
|---------------------------------------|---|
| Panel A. Variables used in DSS | |
| Branch-HHI | The sample average of the Herfindahl-Hirschman Index (HHI) at the county where the branch is located. For every year the HHI is calculated by summing up the squared deposit-market shares of all banks that operate branches in a given county. <i>Source:</i> FDIC Summary of Deposits (SOD). |
| Bank-HHI | Annual weighted average of Branch-HHI across all branches of an individual bank, using deposit shares across branches as weights. <i>Source:</i> FDIC Summary of Deposits (SOD) |
| County-HHI | Annual weighted average of Bank- HHI across all banks lending in a given county, using their lagged lending shares as weights. <i>Source:</i> FDIC Summary of Deposits (SOD). |
| new lending | The total amount of new small business loans originated by a given bank in a given county and year. <i>Source:</i> Community Reinvestment Act (CRA). |
| ΔFF | Change in the year end federal funds target rate. From 2008 the target is the average of the upper and lower target. <i>Source:</i> Federal Reserve Economic Data (FRED). |
| Employment | Annual county level total employment. <i>Source:</i> Bureau of Labor Statistics (BLS). |
| Wage Bill | Annual county level total wage bill. <i>Source:</i> Bureau of Labor Statistics (BLS). |
| Panel B. Additional variables | |
| Lerner | Annual bank level Lerner index. <i>Source:</i> Author calculation, see Section A for details. |
| Population | Annual county population. <i>Source:</i> Bureau of Economic Analysis (BEA). |
| Personal Income (per capita) | Annual county level per capita personal income (thousands of dollars). <i>Source:</i> Bureau of Economic Analysis (BEA). |
| House Price Index | Annual average of the county level house price index, all-Transactions Indexes. <i>Source:</i> Federal Housing Finance Agency (FHFA). |

B.1 NARROW REPLICATION WITH DSS DATA

Table B.2: Narrow Replication of DSS Table I (Descriptive Statistics)

| Panel A: County characteristics | | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
| | All | | Low HHI | | High HHI | |
| | Mean | Std. dev. | Mean | Std. dev. | Mean | Std. dev. |
| Median Income | 42,183.02 | 9,844.31 | 45,815.75 | 10,155.88 | 38,550.30 | 8,020.66 |
| Over 65 | 14.78 | 4.14 | 14.18 | 4.02 | 15.37 | 4.17 |
| College degree | 16.55 | 7.81 | 18.82 | 8.53 | 14.27 | 6.23 |
| Branch-HHI | 0.35 | 0.20 | 0.20 | 0.05 | 0.49 | 0.20 |
| Obs. | 3,104 | | 1,552 | | 1,552 | |
| Panel B: Branch Characteristics (FDIC) | | | | | | |
| | All | | Low HHI | | High HHI | |
| | Mean | Std. dev. | Mean | Std. dev. | Mean | Std. dev. |
| Deposits | 66.96 | 880.25 | 58.94 | 274.77 | 74.92 | 1,211.52 |
| Deposits growth | 7.79 | 25.56 | 8.71 | 26.86 | 6.88 | 24.17 |
| Change FF | -0.25 | 1.44 | -0.26 | 1.44 | -0.24 | 1.44 |
| Branch-HHI | 0.22 | 0.11 | 0.15 | 0.03 | 0.29 | 0.11 |
| Obs. | 1,305,770 | | 649,935 | | 655,835 | |
| Panel D: Branch Characteristics (Call Reports) | | | | | | |
| | All | | Low HHI | | High HHI | |
| | Mean | Std. dev. | Mean | Std. dev. | Mean | Std. dev. |
| Assets (mill) | 1,082.93 | 22,506.94 | 810.51 | 12,352.06 | 1,355.36 | 29,332.65 |
| Deposits/Liab. | 94.02 | 7.58 | 93.84 | 7.70 | 94.20 | 7.45 |
| Branches | 9.76 | 78.31 | 8.81 | 68.63 | 10.70 | 86.91 |
| Bank-HHI | 0.24 | 0.13 | 0.15 | 0.04 | 0.33 | 0.13 |
| Obs. | 559,712 | | 279,856 | | 279,856 | |
| Panel E: Small Business Lending (NCRC) | | | | | | |
| | All | | Low HHI | | High HHI | |
| | Mean | Std. dev. | Mean | Std. dev. | Mean | Std. dev. |
| New lending (mill) | 5.75 | 22.97 | 6.31 | 24.41 | 5.20 | 21.41 |
| New lending (log) | 6.88 | 1.63 | 6.94 | 1.65 | 6.82 | 1.61 |
| Assets | 132.18 | 308.26 | 122.02 | 306.25 | 142.33 | 309.93 |
| Bank-HHI | 0.25 | 0.14 | 0.17 | 0.04 | 0.33 | 0.15 |
| Obs. | 621,667 | | 310,615 | | 311,052 | |

This table replicates Table I from Drechsler, Savov, and Schnabl (2017).

Table B.3: Narrow Replication of DSS Table III (Deposit Growth and Monetary Policy)

| | $\Delta \log \text{ Deposits}$ | | | | | |
|--------------------------|--------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | $\geq 2 \text{ Counties}$ | | | All | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| ΔFF x Branch-HHI | -0.710*** (0.247) | -1.083*** (0.326) | -0.901*** (0.260) | -1.874*** (0.195) | -1.869*** (0.242) | -1.011*** (0.222) |
| Bank x year f.e. | Y | Y | N | N | N | N |
| State x year f.e. | Y | N | N | Y | N | N |
| Branch f.e. | Y | Y | N | Y | Y | N |
| County f.e. | Y | Y | Y | Y | Y | Y |
| Quarter f.e. | Y | Y | Y | Y | Y | Y |
| Observations | 1,148,072 | 1,148,072 | 1,148,072 | 1,305,770 | 1,305,770 | 1,305,770 |
| R ² | 0.363 | 0.356 | 0.025 | 0.248 | 0.239 | 0.025 |

This table replicates Table III from Drechsler, Savov, and Schnabl (2017). *p<0.10; **p<0.05; ***p<0.01.

Table B.4: Narrow Replication of DSS Table V Panel B (Deposits, Monetary Policy, and Financial Sophistication)

| | $\Delta \log \text{ Deposits}$ | | | |
|--------------------------|--------------------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| ΔFF x Branch-HHI | -1.272*** (0.189) | -1.512*** (0.204) | -1.596*** (0.200) | -1.267*** (0.195) |
| ΔFF x Age | -6.461*** (0.652) | | | -6.476*** (0.790) |
| ΔFF x Income | | 0.453*** (0.151) | | 0.046 (0.233) |
| ΔFF x College | | | 0.939*** (0.297) | -0.111 (0.452) |
| All f.e. | Y | Y | Y | Y |
| Observations | 1,299,505 | 1,299,505 | 1,299,505 | 1,299,505 |
| R ² | 0.231 | 0.231 | 0.231 | 0.231 |

This table replicates Panel B of Table V from Drechsler, Savov, and Schnabl (2017). *p<0.10; **p<0.05; ***p<0.01.

Table B.5: Narrow Replication of DSS Table VIII (Bank-Level Results)

| Panel A: Liabilities | | | | | | |
|------------------------|-------------------------|-------------------------|---------------------------|------------------------|----------------------------|----------------------|
| | Δ Total deposits | Δ Deposit spread | Δ Savings deposits | Δ Time deposits | Δ Wholesale funding | Δ Liabilities |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| ΔFF x Bank-HHI | -1.483*** (0.145) | 0.064*** (0.009) | -1.231*** (0.244) | -2.162*** (0.214) | 2.403** (0.949) | -1.289*** (0.140) |
| Bank f.e. | Y | Y | Y | Y | Y | Y |
| Quarter f.e. | Y | Y | Y | Y | Y | Y |
| Observations | 559,712 | 559,712 | 559,712 | 559,712 | 559,712 | 559,712 |
| R ² | 0.158 | 0.366 | 0.079 | 0.166 | 0.034 | 0.171 |
| Panel B: Assets | | | | | | |
| | Δ Total deposits | Δ Deposit spread | Δ Savings deposits | Δ Time deposits | Δ Wholesale funding | Δ Liabilities |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| ΔFF x Bank-HHI | -1.209*** (0.124) | -2.439*** (0.667) | -0.961*** (0.337) | -0.465*** (0.152) | -0.831*** (0.200) | -0.923*** (0.352) |
| Bank f.e. | Y | Y | Y | Y | Y | Y |
| Quarter f.e. | Y | Y | Y | Y | Y | Y |
| Observations | 559,712 | 559,712 | 559,712 | 559,712 | 559,712 | 559,712 |
| R ² | 0.172 | 0.051 | 0.063 | 0.217 | 0.170 | 0.060 |

This table replicates Table VIII from Drechsler, Savov, and Schnabl (2017). * p<0.10; ** p<0.05; *** p<0.01.

B.2 NARROW REPLICATION WITH ORIGINAL DATA

Table B.6: Narrow (Original Data) Replication of DSS Table VI (Bank-County Results)

| | log(new lending) | | | |
|-----------------------------|---------------------|--------------------|--------------------|--------------------|
| | (1) | (2) | (3) | (4) |
| $\Delta FFX_{Bank} - HHI$ | -0.181** (0.090) | -0.174* (0.094) | -0.148* (0.081) | -0.147* (0.080) |
| $\Delta FFX_{Branch} - HHI$ | | 0.024 (0.017) | 0.007 (0.024) | |
| Observations | 623,272 | 623,272 | 623,272 | 623,272 |
| R ² | 0.830 | 0.815 | 0.246 | 0.246 |
| Time f.e. | Y | Y | Y | Y |
| Bank f.e. | Y | Y | Y | Y |
| County f.e. | Y | Y | Y | Y |
| County-bank f.e. | Y | Y | N | N |
| County-time f.e. | Y | N | N | N |

This table replicates Table VI from Drechsler, Savov, and Schnabl (2017). *p<0.10; **p<0.05; ***p<0.01.

Table B.7: Narrow (Original Data) Replication of DSS Table VII (County-Level Results)

| | log(new lending) | | Δ Employment | | Δ Wage Bill | |
|-----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $\Delta FFX_{County} - HHI$ | -0.134*** (0.025) | -0.142*** (0.029) | -0.015*** (0.003) | -0.009*** (0.003) | -0.012*** (0.003) | -0.011*** (0.004) |
| $\Delta FFX_{Branch} - HHI$ | | 0.006 (0.009) | | -0.004*** (0.001) | | -0.001 (0.001) |
| Time f.e. | Y | Y | Y | Y | Y | Y |
| County f.e. | Y | Y | Y | Y | Y | Y |
| Observations | 54,096 | 54,096 | 54,096 | 54,096 | 54,096 | 54,096 |
| R ² | 0.948 | 0.948 | 0.201 | 0.202 | 0.272 | 0.272 |

This table replicates Table VII from Drechsler, Savov, and Schnabl (2017). *p<0.10; **p<0.05; ***p<0.01.

B.3 ADDITIONAL TABLES FOR WIDE REPLICATION

Table B.8: Credit Card Banks

| Bank Name | RSSD ID | FDIC # | Avg Number of Branches |
|---|---------|--------|------------------------|
| Bank of America, National Association (USA) | 1417557 | 27595 | 1.2 |
| Capital One Bank (USA), N.A. | 2253891 | 33954 | 1.1 |
| Chase Bank USA, N.A. | 489913 | 23702 | 2.5 |
| Citibank (South Dakota), N.A. | 486752 | 23360 | 1.5 |
| Citibank USA, N.A. | 112855 | 16100 | 1.0 |
| Discover Bank | 30810 | 5649 | 2.4 |
| FIA Card Services, N.A. | 1830035 | 33318 | 2.1 |
| Wells Fargo Bank Northwest, N.A. | 688079 | 13718 | 1.0 |
| U.S. Bank National Associate ND | 2582023 | 34590 | 1.0 |

This table lists nine credit card banks in the DSS sample. Following Adams, Brevoort, and Driscoll (2020), these banks are identified by having at least \$1 billion in small loans (under \$100,000) in a given year with at least 75% of total loan originations consisting of small loans. Wells Fargo Bank Northwest operated as a standard retail bank with a much larger number of branches until 2004, at which point its retail operations were consolidated to Wells Fargo Bank, NA.

Table B.9: Credit Card vs. Retail Banks Descriptive Statistics

| | Retail Banks | | | Credit Card Banks | | |
|----------------|--------------|-----------|--------|-------------------|-----------|-----------|
| | Mean | Std. dev. | Median | Mean | Std. dev. | Median |
| Assets (mill) | 5,235.56 | 53,077.54 | 497.53 | 41,279.61 | 43,364.87 | 24,600.29 |
| Deposits/Liab. | 89.02 | 11.15 | 91.79 | 41.77 | 29.91 | 40.32 |
| Branches | 38.48 | 217.44 | 9 | 1.47 | 0.64 | 1 |
| Bank-HHI | 0.22 | 0.10 | 0.20 | 0.42 | 0.26 | 0.30 |

This table presents descriptive statistics for for the nine credit card banks listed in Table B.8 and all other retail banks in DSS database (total of 2136 banks).

Table B.10: DSS Table VI. Dropping Credit Card Banks in 2008

| | log (new lending) | | | |
|--------------------------|-------------------|-------------------|--------------------|-------------------|
| | (1) | (2) | (3) | (4) |
| ΔFF x Bank-HHI | -0.094 (0.073) | -0.090 (0.072) | -0.078 (0.054) | -0.088 (0.054) |
| ΔFF x Branch-HHI | | -0.005 (0.014) | -0.042* (0.022) | |
| Time f.e. | Y | Y | Y | Y |
| Bank f.e. | Y | Y | Y | Y |
| County f.e. | Y | Y | Y | Y |
| County-bank f.e. | Y | Y | N | N |
| County-time f.e. | Y | N | N | N |
| Observations | 608,568 | 608,568 | 608,568 | 608,568 |
| R ² | 0.829 | 0.814 | 0.242 | 0.242 |

This table replicates Table VI from Drechsler, Savov, and Schnabl (2017) while dropping nine credit card banks in 2008 only. *p<0.10; **p<0.05; ***p<0.01.

Table B.11: DSS Table VI. With Lerner Index. Dropping Credit Card Banks

| | Full Sample | | Pre-ZLB | |
|--------------------------|--------------------|---------------------|--------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| ΔFF x Lerner | 0.082** (0.035) | 0.086*** (0.032) | 0.094** (0.044) | 0.097** (0.044) |
| ΔFF x Branch-HHI | | -0.003 (0.011) | | -0.033*** (0.011) |
| Observations | 510,840 | 510,840 | 345,659 | 345,659 |
| R ² | 0.834 | 0.816 | 0.858 | 0.841 |
| Time f.e. | Y | Y | Y | Y |
| Bank f.e. | Y | Y | Y | Y |
| County f.e. | Y | Y | Y | Y |
| County-bank f.e. | Y | Y | Y | Y |
| County-time f.e. | Y | N | Y | N |

This table replicates Table VI from Drechsler, Savov, and Schnabl (2017), replacing Bank-HHI with the Lerner index, and dropping nine credit card banks. Columns (1) and (2) contain results for the original 1997-2013 sample period. Columns (3) and (4) contain results for the pre-ZLB 1997-2007 sample period. *p<0.10; **p<0.05; ***p<0.01.

Figure B.1: Credit Card and Retail Bank Dynamics

