Overdraft Facts

Authors

This methodology supplement was written by Rourke Liam O'Brien, postdoctoral research fellow, Harvard University, and Joy Hackenbracht, research officer, The Pew Charitable Trusts. All findings presented here are drawn from the Federal Deposit Insurance Corp. (FDIC) Call Report and Thrift Financial Report data.

Acknowledgments

Methodology supplement

Key research question. What is the impact of institutional overdraft policies on the overdraft revenue of major financial institutions?

Data. Merged FDIC Call Report and Thrift Financial Report second-quarter data with Pew's data on overdraft policies from *Checks and Balances: 2015 Update*. The FDIC Call Report data for the second quarter include service charges for the first half of 2015 (Jan. 1 to June 30).

Analytic sample. In prior research, documented in *Checks and Balances: 2015 Update*, Pew studied disclosures from the 50 largest banks based on domestic deposit volume as tabulated in June 2014 by the FDIC. At each bank, the most basic checking account was chosen for analysis. In November 2014, Pew examined the following disclosure documents from each financial institution's website: disclosure box, fee schedule, account agreement, and screenshots. In May 2015, Informa Research Services Inc. independently collected disclosure documents from each financial institution and verified the accuracy of the data included in the report.

Using methods described in *Checks and Balances: 2015 Update*, Pew was able to obtain full documentation for 45 of the 50 largest banks. Of these, 42 financial institutions (FIs) reported consumer overdraft-related service charges for the first half of 2015 as of Aug. 27, 2015. The two FIs that did not—Charles Schwab and Scottrade—were excluded from the sample because they reported zero dollars in overdraft charges. Additionally, one FI—BBVA Compass—was excluded from the sample because all service charges were noted as "not reported." The resulting analytic sample consisted of 42 FIs. Results reported below are substantively robust for inclusion of these FIs.

Key variables. The key dependent variable in this analysis is consumer overdraft-related service charges (RIADH032). A log transformation was performed, as this variable has a significant right skew.

```
Stem-and-leaf plot for odcharges
(FDIC: RIADH032 consumer overdraft-related service charges)

   0***** | 00244,00288,00827,01262,01432,01993,04612,07323,09000, ... (26)
   0***** | 52961,53000,57246,62622,67001,69460,77355
   1***** | 10898,43544
   1***** | 62084,63008
   2***** | 07419,18166
   2***** |
   3***** |
   3***** |
   4***** |
   4***** |
   5***** |
   5***** |
   6***** |
   6***** |
   7***** |
   7***** | 56000,68000
   8***** |
   8***** | 71000
```

A key control variable in the analysis is consumer deposit volume, which served as a proxy for bank size, transactions, and number of accounts. This was calculated as the sum of deposits in noninterest-bearing transaction accounts (RCONP753), interest-bearing transaction accounts (RCONP754), and money market deposit accounts (RCONP756) intended primarily for individuals for personal, household, or family use. A log transformation was performed, as this variable is also significantly right skewed.

```
Stem-and-leaf plot for deposits
(egen deposits = rowtotal(depositsnib depositsib mmda))

    0******* | .08e+07,.19e+07,.21e+07,.21e+07,.28e+07,.28e+07,.33e+07, ... (19)
    1******* | .52e+07,.61e+07,.68e+07
    2******* | .03e+07,.34e+07,.36e+07,.40e+07,.43e+07,.53e+07,.62e+07
    3******* | .05e+07,.29e+07,.56e+07
    4******* | .24e+07,.42e+07,.64e+07
    5******* | .39e+07
    6******* | .87e+07
    7******* |
    8******* |
    9******* | .66e+07
   10******* |
   11******* |
   12******* | .36e+07
   13******* |
   14******* |
   15******* |
   16******* |
   17******* |
   18******* |
   19******* |
   20******* |
   21******* |
   22******* |
   23******* |
```

```
24******* |
25******* |
26******* |
27******* | .55e+07
28******* |
29******* |
30******* |
31******* |
32******* |
33******* |
34******* |
35******* | .07e+07
36******* |
37******* |
38******* | .78e+07
```

Consumer overdraft-related service charges and consumer deposit volume both passed conventional tests for normality after log transformation, as shown below.

```
. swilk odcharges logodcharges deposits logdeposits if odcharges>0 & odcharges!=.

                           Shapiro-Wilk W test for normal data
     Variable |      Obs          W           V           z          Prob>z
--------------+--------------------------------------------------------------
    odcharges |       42       0.49522      20.718       6.397        0.00000
 logodcharges |       42       0.96789       1.318       0.583        0.27998
     deposits |       42       0.51003      20.111       6.335        0.00000
  logdeposits |       42       0.97118       1.183       0.354        0.36149
```

Other key variables. These include whether the financial institution allows debit point-of-sale (POS) overdrafts and/or ATM overdrafts (categorical 1-4); the overdraft penalty fee (continuous); and whether the FI reorders transactions from high to low by dollar amount (binary 0-1).

Analytic approach. To estimate the effect of institutional policies on overdraft revenue net of the size of the financial institution, we estimated an ordinary least squares regression with robust standard errors wherein:

$$Ln(Y) = \beta 1(policy) + \beta 2Ln(deposits) + \varepsilon$$

where **Y** is the total overdraft revenue (logged), **β**1 is the estimated coefficient for the focal policy, **β**2 is the coefficient for the total number of consumer deposits (control), and **ε** is our error term (estimated using Huber-White sandwich estimators).

Result 1. To analyze the relationship between overdraft policies and overdraft revenue, we assigned categories to FIs based on whether they disallow both debit POS and ATM overdrafts, disallow only POS overdrafts, disallow only ATM overdrafts, or allow both POS and ATM overdrafts. This variable was entered into the model as a series of categorical "dummy" variables. The coefficients in the model can be interpreted in reference to FIs that disallow both POS and ATM overdrafts (reference category).

The model indicates that FIs that allow POS and ATM overdrafts report significantly more ($p < 0.01$) overdraft revenue than do FIs that disallow POS and ATM overdrafts, controlling for the size of the FI. The selected model fit the data better than the identical model without the transformations (AIC = 144.56 vs. 1032.99; BIC = 149.77 vs. 1038.20).

```
. regress logodcharges i.posatmoverdraft logdeposits if odcharges>0, robust base

Linear regression                                              Number of obs =        42
                                                               F(  2,     37) =         .
                                                               Prob > F       =         .
                                                               R-squared      =    0.5599
                                                               Root MSE       =    1.3417

---------------------------------------------------------------------------------------
                     |               Robust
       logodcharges  |     Coef.    Std. Err.      t     P>|t|     [95% Conf. Interval]
---------------------+-----------------------------------------------------------------
      posatmoverdraft |
  Disallows POS and ATM  |         0   (base)
        Disallows POS  |  2.234232    .6952921     3.21   0.003     .8254362    3.643027
        Disallows ATM  |  2.273617    .7072465     3.21   0.003     .8405997    3.706635
   Allows POS and ATM  |  1.586182    .5272726     3.01   0.005      .517826    2.654538
                     |
         logdeposits  |   .8592602    .1605346     5.35   0.000     .5339863    1.184534
               _cons  | -5.588945    2.689394    -2.08   0.045    -11.03818   -.1397141
---------------------------------------------------------------------------------------
```

For log linear regressions, changes in the natural log can be interpreted as approximate percentage changes. For dummy variables in log linear models, the effect of going from 0 to 1 is equal to:

$$100 \ * \ exp\{\beta\} - 1$$

where β is the estimated coefficient for the focal policy. Thus, the approximate percentage change in overdraft charges for FIs that allow both debit POS and ATM overdrafts compared with FIs that disallow both types of overdraft is 100 * exp(1.586182) - 1 = 388.51%.

Result 2. Across FIs, higher overdraft penalty fees are associated with higher overdraft revenue. Specifically, a $1 increase in the overdraft fee charged by the FI is associated with a 6% ($p < 0.001$) increase in overdraft revenue, net of consumer deposits in the FI. The selected model demonstrates a better fit than the identical model without the transformations (AIC = 140.77 vs. 1033.67; BIC = 145.99 vs. 1038.89).

```
. regress logodcharges odpenaltyfee logdeposits if odcharges>0, robust

Linear regression                                              Number of obs =        42
                                                               F(  2,     39) =     40.63
                                                               Prob > F       =    0.0000
                                                               R-squared      =    0.5979
                                                               Root MSE       =    1.2493

---------------------------------------------------------------------------------------
                 |               Robust
  logodcharges   |     Coef.    Std. Err.      t     P>|t|     [95% Conf. Interval]
-----------------+---------------------------------------------------------------------
   odpenaltyfee  |    .055469    .0147882     3.75   0.001     .025557     .085381
    logdeposits  |   .8733106    .1244042     7.02   0.000    .6216792    1.124942
          _cons  |  -6.067081    2.055118    -2.95   0.005   -10.22395   -1.910212
---------------------------------------------------------------------------------------
```

Result 3. FIs that reorder transactions from high to low by dollar amount tend to post overdraft revenue that is higher than FIs that do not. This effect, however, did not approach conventional levels of statistical significance.

As with the previous models, the log transformed model fit the data better than the identical model without the transformations (AIC = 149.38 vs. 1040.81; BIC = 154.60 vs. 1046.03).

The approximate percentage change in overdraft revenue for FIs that reorder transactions from high to low compared with FIs that do not is equal to 100 * exp(.633787) - 1 = 88.47%.

```
. regress logodcharges i.reorder logdeposits if odcharges>0, robust base

Linear regression                                      Number of obs =        42
                                                       F(  2,    39) =     24.68
                                                       Prob > F      =    0.0000
                                                       R-squared     =    0.5064
                                                       Root MSE      =    1.3841
-------------------------------------------------------------------------------
                        |               Robust
          logodcharges |     Coef.   Std. Err.     t    P>|t|   [95% Conf.Interval]
-----------------------+-------------------------------------------------------
                reorder |
No high-to-low reordering |          0  (base)
   High-to-low reordering |    .633787   .4218847   1.50   0.141   -.2195554   1.487129
                        |
           logdeposits |   .8829966   .1256888   7.03   0.000    .628767    1.137226
                  _cons |  -4.868605   2.178506  -2.23   0.031  -9.275049   -.4621608
-------------------------------------------------------------------------------
```

For further information, please visit:

pewtrusts.org/banking