The Deposits Channel of Monetary Policy

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\textsuperscript{1}Wharton and NBER  \textsuperscript{2}NYU Stern and NBER

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This paper

We propose and test a new channel of monetary policy

1. Monetary policy has a powerful impact on the price and quantity of deposits supplied by the banking system
   - Higher nominal rate $\Rightarrow$ deposit supply $\downarrow$ deposit price (spread) $\uparrow$

2. Why? Banks have market power in supplying deposits. A higher nominal interest rate increases this market power
   - Deposits and cash are the two main sources of household liquidity
   - Higher nominal rate $\Rightarrow$ cash more expensive $\Rightarrow$ banks face less competition in liquidity provision $\Rightarrow$ act like monopolist

3. We show channel at aggregate, county, bank, and branch levels
   - Identification: exploit differences in deposit rates across branches within the same bank
   - Finding: Higher nominal rates lead to higher deposit prices and lower deposit growth in markets where banks have more market power

Drechsler, Savov, and Schnabl (2016)
Implications

Higher nominal rate ⇒ less deposits ⇒

For banks:
1. Deposits are the main source of funding for banks:
   $10 trillion, 77% of bank liabilities (2014)
2. Less prone to runs than wholesale funding, very hard to replace
⇒ Bank lending channel (“without reserves”)
⇒ Risky and illiquid assets especially affected
   (Kashyap, Rajan, Stein 2002; Hanson, Shleifer, Stein, Vishny 2014)

For households:
1. Deposits are the main source of liquidity for households
⇒ Reduces supply of safe assets and increases the liquidity premium
⇒ Affects leverage, risk-taking, and cost of capital

Drechsler, Savov, and Schnabl (2016)
Higher nominal rate $\rightarrow$ higher price of deposits

Price of deposits: Deposit spread = Fed funds rate – deposit rate

1. Analyze average rate on core deposits (checking, savings, small time)
   $\Rightarrow$ Price increases by 61 bps for each 100 bps increase in Fed funds rate
   $\Rightarrow$ Large variation from 0 bps to to 500 bps

Drechsler, Savov, and Schnabl (2016)
Higher price increase for liquid deposits

Price of deposits: Deposit spread = Fed funds rate – deposit rate

1. Analyze average rate by deposit product (checking, savings, time)
   ⇒ Spread increases more for liquid deposits (checking, savings)

Drechsler, Savov, and Schnabl (2016)
Higher nominal rate → large outflows of savings deposits

1. Savings deposits are largest category $8.2 trillion, 79% of total
2. Large flows: from $-12\%$ to $+24\%$ per year

*Drechsler, Savov, and Schnabl (2016)*
Higher nominal rate → large outflows of checking deposits

1. Checking deposits are $1.7 trillion, 16% of total
2. Large flows: from −11% to +21% per year

*Drechsler, Savov, and Schnabl (2016)*
Higher nominal rate → inflows of small time deposits

Year-on-year change in Fed funds and time deposits

1. Small time deposits are $0.4 trillion, 4% of total
2. Large flows: from $-15\%$ to $+21\%$ per year
   ⇒ Reallocation from liquid deposits to less liquid deposits

*Drechsler, Savov, and Schnabl (2016)*
Higher nominal rate $\rightarrow$ less total deposits

1. Total deposits are $10.3$ trillion
2. Large flows: from $-1\%$ to $+12\%$ per year

*Drechsler, Savov, and Schnabl (2016)*
Aggregate results bottom line

1. Deposits are **large**
   - $10.3 trillion (savings $8.2t; checkable $1.6t; time $0.4t)

2. Deposit spreads increase ([price ↑](#)) with nominal rate
   - 100 bps Fed funds increase ⇒ deposit spread increases by 61 bps

3. Deposits shrink ([quantity ↓](#)) with nominal rate
   - 400 bps Fed funds increase ⇒ yoy outflows of −5%

⇒ Monetary policy appears to shift the supply of deposits

_Drechsler, Savov, and Schnabl (2016)_
1. **Bank lending/balance sheet channel theory:** Bernanke (1983); Bernanke and Blinder (1988); Bernanke and Gertler (1989); Kashyap and Stein (1994); Kiyotaki and Moore (1997); Stein (1998, 2012)

2. **Bank lending channel empirics:** Kashyap, Stein, and Wilcox (1992); Kashyap and Stein (2000); Campello (2002); Dell’Ariccia, Laeven, and Suarez (2013); Jiménez, Ongena, Peydró, and Saurina (2014); Scharfstein and Sunderam (2014)

3. **Banks as liquidity providers:** Diamond and Dybvig (1983); Gorton and Pennacchi (1990); Kashyap, Rajan, and Stein (2002); Krishnamurthy and Vissing-Jorgensen (2012); Driscoll and Judson (2013); Hanson, Shleifer, Stein, and Vishny (2014); Drechsler, Savov, and Schnabl (2014); Nagel (2014)
Theory: intuition

Setup:
1. A representative household has utility over wealth and liquidity
2. Three types of assets
   - **Bonds**: provide no liquidity, pay competitive rate $f$ (Fed funds rate)
   - **Cash**: provides liquidity, pays no interest
     ⇒ opportunity cost = $f$
   - **Deposits**: provide partial liquidity ($\delta < 1$), pay rate $f - s$
     ⇒ opportunity cost = $s$
3. Deposits created by $N$ monopolistically competitive banks

Mechanism:
- $\uparrow$ Fed funds rate ⇒ cash becomes a more expensive source of liquidity
- ⇒ Banks face less competition in liquidity provision (market power $\uparrow$)
- ⇒ Banks optimally increase deposit spread $s$
- ⇒ Households substitute away from deposits (and cash) and into bonds

*Drechsler, Savov, and Schnabl (2016)*
Theory: results

$\rho < 1 = \text{elasticity between liquidity and wealth (complements)}$
$\epsilon > 1 = \text{elasticity between deposits and cash (substitutes)}$
$\eta > 1 = \text{elasticity of substitution across banks (substitutes)}$

The composite parameter $\mathcal{M} = 1 - (\eta - 1)(N - 1)$ captures banks’ market power in deposit creation; $\mathcal{M}$ is decreasing in the number of banks $N$ and the elasticity of substitution across banks $\eta$.

If $\mathcal{M}$ is sufficiently low ($< \rho$), the deposit spread $s = 0$. Otherwise,

$$s = \frac{\rho}{\epsilon - 1} \left( \frac{\mathcal{M} - \rho}{\epsilon - \mathcal{M}} \right)^{\frac{1}{\epsilon - 1}} f$$

The deposit spread $s$

(i) increases with Fed funds rate $f$
(ii) increases more with Fed funds rate $f$ where market power $\mathcal{M}$ is high

Drechsler, Savov, and Schnabl (2016)
Empirical strategy on deposits

Does monetary policy have a direct effect on deposit supply?

Identification challenge:

1. Deposit supply and monetary policy may be reacting to economic conditions (omitted variable)

2. Deposit supply may be reacting to monetary policy through bank assets or capital (indirect effect)

⇒ Exploit cross-sectional variation in competitiveness

⇒ Within-bank estimation, event study methodology, other tests to rule out alternatives

Drechsler, Savov, and Schnabl (2016)
Data and measures

Data:

3. Bank-level data: U.S. Call Reports
4. County characteristics: County Business Patterns, IRS, FDIC

Measures:

1. Use most common deposit products: $25k Money Market account (savings deposits); $10k one-year CDs (time deposits)
2. Competition: County-level deposit Herfindahl (Branch-HHI)
3. Deposit spread = Fed funds rate – deposits rate

Drechsler, Savov, and Schnabl (2016)
Identification I: within-bank estimation

1. Lending opportunities are a potential omitted variable
   - Differences in lending opportunities need to be correlated with bank competition *and* changes in monetary policy

⇒ Control for bank lending opportunities by looking across branches of the *same* bank (and in the same state)
   - Multi-branch bank can lend at one branch, raise deposits at another
   - E.g. compare deposits at Citi branch in low-competition county with deposits at Citi branch in high-competition county
   - Identifying assumption:
     A deposit raised at one branch can be lent at another branch
### Descriptive statistics

#### County competition (HHI) map

![County competition (HHI) map](image)

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>High Competition</th>
<th>Low Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>90,845</td>
<td>150,081</td>
<td>28,717</td>
</tr>
<tr>
<td>Area (sq. mile)</td>
<td>1,057</td>
<td>903</td>
<td>1,217</td>
</tr>
<tr>
<td>Median income</td>
<td>36,406</td>
<td>39,332</td>
<td>33,343</td>
</tr>
<tr>
<td>Over age 65 (in %)</td>
<td>14.78</td>
<td>14.22</td>
<td>15.35</td>
</tr>
<tr>
<td>College degree (in %)</td>
<td>16.55</td>
<td>18.69</td>
<td>14.3</td>
</tr>
<tr>
<td>Branch-HHI</td>
<td>0.36</td>
<td>0.21</td>
<td>0.51</td>
</tr>
<tr>
<td>Obs. (counties)</td>
<td>3,104</td>
<td>1,589</td>
<td>1,515</td>
</tr>
</tbody>
</table>

*Drechsler, Savov, and Schnabl (2016)*
Cross-sectional evidence: savings deposit spreads

1. For each branch, run $\Delta Spread = \alpha + \beta \Delta FF + \varepsilon$
2. Plot average $\beta$ in 20 competition bins ($\approx 130$ counties per bin)

$\Rightarrow$ As Fed funds rises, savings deposit spreads increase more in uncompetitive counties

Drechsler, Savov, and Schnabl (2016)
Cross-sectional evidence: time deposit spreads

1. For each branch, run $\Delta Spread = \alpha + \beta \Delta FF + \varepsilon$
2. Plot average $\beta$ in 20 competition bins ($\approx 130$ counties per bin)

$\Rightarrow$ As Fed funds rises, time deposit spreads increase more in uncompetitive counties

*Drechsler, Savov, and Schnabl (2016)*
Cross-sectional evidence: deposit flows

1. For each branch, run $Flow = \alpha + \beta \Delta FF + \varepsilon$
2. Plot average $\beta$ in 20 competition bins

|$\Rightarrow$ As Fed funds rises, deposit growth is lower in uncompetitive counties

_Drechsler, Savov, and Schnabl (2016)_
Identification I: within-bank estimation

1. Estimation in first differences:

\[ \Delta y_{it} = \alpha_i + \zeta_{c(i)} + \lambda_{s(i)t} + \delta_{j(i)t} + \gamma \Delta FF_t \times HHI_i + \varepsilon_{it}, \]

- \( \Delta y_{it} \) = Branch-level change in deposit spread/deposit flow
- \( \Delta FF_t \) = Change in Fed funds target rate
- \( HHI_i \) = County-level competition (Branch-HHI)
- \( \delta_{j(i)t} \) = Bank-time fixed effects
- \( \zeta_{c(i)} \) = County fixed effects
- \( \lambda_{s(i)t} \) = State-time fixed effects

2. Standard errors clustered at the county level

*Drechsler, Savov, and Schnabl (2016)*
Results: savings deposit spreads

\[ \Delta \text{Spread}_{it} = \alpha_i + \zeta_{c(i)} + \lambda_{s(i)t} + \delta_{j(i)t} + \gamma \Delta FF_t \times HHI_i + \varepsilon_{it} \]

<table>
<thead>
<tr>
<th></th>
<th>Banks in ≥ 2 counties</th>
<th>All banks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>( \Delta FF \times HHI )</td>
<td>0.141***</td>
<td>0.101***</td>
</tr>
<tr>
<td></td>
<td>[0.033]</td>
<td>[0.031]</td>
</tr>
<tr>
<td>Bank × qtr f.e.</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>State × qtr f.e.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Branch f.e.</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>County f.e.</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Quarter f.e.</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Obs.</td>
<td>117,701</td>
<td>117,701</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.810</td>
<td>0.799</td>
</tr>
</tbody>
</table>

⇒ 100 bps Fed Funds rate increase → 14 bps increase in low- vs. high-competition areas (≈ 1/3 standard deviation)

Drechsler, Savov, and Schnabl (2016)
Results: time deposit spreads

\[ \Delta \text{Spread}_{it} = \alpha_i + \zeta_{c(i)} + \lambda_{s(i)t} + \delta_{j(i)t} + \gamma \Delta \text{T-Bill}_t \times \text{HHI}_i + \varepsilon_{it} \]

<table>
<thead>
<tr>
<th>Banks in ( \geq 2 ) counties</th>
<th>All banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
</tr>
</tbody>
</table>

\begin{align*}
\Delta \text{T-Bill} \times \text{HHI} & \quad 0.073^{***} & 0.073^{***} & 0.155^{***} & 0.156^{***} & 0.119^{***} & 0.119^{***} \\
& [0.025] & [0.026] & [0.037] & [0.026] & [0.024] & [0.023] \\
\text{Bank} \times \text{qtr f.e.} & \quad \text{Y} & \quad \text{Y} & \quad \text{N} & \quad \text{N} & \quad \text{N} & \quad \text{N} \\
\text{State} \times \text{qtr f.e.} & \quad \text{Y} & \quad \text{N} & \quad \text{N} & \quad \text{Y} & \quad \text{N} & \quad \text{N} \\
\text{Branch f.e.} & \quad \text{Y} & \quad \text{Y} & \quad \text{N} & \quad \text{Y} & \quad \text{Y} & \quad \text{N} \\
\text{County f.e.} & \quad \text{Y} & \quad \text{Y} & \quad \text{Y} & \quad \text{Y} & \quad \text{Y} & \quad \text{Y} \\
\text{Quarter f.e.} & \quad \text{Y} & \quad \text{Y} & \quad \text{Y} & \quad \text{Y} & \quad \text{Y} & \quad \text{Y} \\
\text{Obs.} & 122,008 & 122,008 & 122,008 & 430,080 & 430,080 & 430,080 \\
R^2 & 0.808 & 0.796 & 0.442 & 0.513 & 0.492 & 0.488
\end{align*}

⇒ 100 bps Fed Funds rate increase → 7 bps increase in low- vs. high-competition areas (\( \approx \) 1/4 standard deviation)

Drechsler, Savov, and Schnabl (2016)
Results: deposit growth

\[ \Delta \log(\text{Deposits}_{it}) = \alpha_i + \zeta c(i) + \lambda s(i) t + \delta j(i) t + \gamma \Delta FF_t \times \text{HHI}_i + \varepsilon_{it} \]

<table>
<thead>
<tr>
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<th>Banks in ≥ 2 counties</th>
<th>All banks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) (2) (3) (4) (5) (6)</td>
<td></td>
</tr>
<tr>
<td>(\Delta \text{FF} \times \text{Herf.})</td>
<td>-0.661*** -1.008*** -0.827*** -1.827*** -1.796*** -0.963***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.254] [0.331] [0.247] [0.198] [0.242] [0.212]</td>
<td></td>
</tr>
<tr>
<td>Bank × qtr f.e.</td>
<td>Y Y N N N N</td>
<td></td>
</tr>
<tr>
<td>State × qtr f.e.</td>
<td>Y N N Y N N</td>
<td></td>
</tr>
<tr>
<td>Branch f.e.</td>
<td>Y Y N Y Y N</td>
<td></td>
</tr>
<tr>
<td>County f.e.</td>
<td>Y Y Y Y Y Y</td>
<td></td>
</tr>
<tr>
<td>Quarter f.e.</td>
<td>Y Y Y Y Y Y</td>
<td></td>
</tr>
<tr>
<td>Obs.</td>
<td>1,150,049 1,150,049 1,150,049 1,310,111 1,310,111 1,310,111</td>
<td></td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.344 0.336 0.025 0.230 0.221 0.025</td>
<td></td>
</tr>
</tbody>
</table>

\[ \Rightarrow \text{100 bps Fed Funds rate increase} \rightarrow 66 \text{ bps lower deposit growth in low- vs. high-competition areas} \]

Drechsler, Savov, and Schnabl (2016)
Interpretation

**Supply shock:** Results indicate *supply shock* controlling for lending opportunities

↑ Fed funds rate ⇒ deposit price ↑ deposit quantity ↓
- Inconsistent with demand-driven explanations (e.g. wealthy vs. poor counties)

**Economic magnitude:** 100 bps Fed Funds rate increase →
- 14 bps relative increase in savings deposit spread in low-competition counties; 7 bps for time deposits → weighted average 12.4 bps
- 66 bps greater annual outflow of deposits in high Herf counties
⇒ implied demand semi-elasticity of −5.3

*Drechsler, Savov, and Schnabl (2016)*
Identification II: event study methodology

1. Can local economic trends explain change in deposit supply?
   - Hard to think of local deposit supply shocks ⇒ would need to correlate with monetary policy and HHI

2. Examine whether response occurs quickly around Fed funds changes

Drechsler, Savov, and Schnabl (2016)
Results: event study

Low - high competition savings deposit spreads around rate change

⇒ Timing indicates differential response is due to Fed

Drechsler, Savov, and Schnabl (2016)
Identification III: expected rate changes

1. Results show that Fed affects deposit supply
   - In our model this is due to the rate change itself
   - Alternative mechanism: release of private macro information

2. Hold information fixed by looking at *expected* rate changes
   - Unique feature of our setting: price of zero-maturity deposits should respond even to expected rate change
   - Expected rate changes computed from Fed funds futures
   - Testing whether rate itself matters versus private information release

*Drechsler, Savov, and Schnabl* (2016)
Results: expected rate changes

Low - high competition savings deposit spreads around expected rate change

⇒ Rate change causes differential response

Drechsler, Savov, and Schnabl (2016)
Results: unexpected rate changes

Low - high competition savings deposit spreads around unexpected rate change

⇒ Unexpected and expected rate changes have similar effect

Drechsler, Savov, and Schnabl (2016)
### Results: expected rate changes

\[ \Delta \text{Spread}_{it} = \alpha_i + \zeta_c(i) + \lambda_s(i)t + \delta_j(i)t + \gamma \Delta \text{Expected FF}_t \times \text{HHI}_i + \varepsilon_{it} \]

<table>
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</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>$\Delta \text{Exp. FF} \times \text{HHI}$</td>
<td>0.218***</td>
</tr>
<tr>
<td></td>
<td>[0.074]</td>
</tr>
<tr>
<td>$\Delta \text{Unexp. FF} \times \text{HHI}$</td>
<td>0.114*</td>
</tr>
<tr>
<td></td>
<td>[0.061]</td>
</tr>
<tr>
<td>Bank $\times$ qtr f.e.</td>
<td>Y</td>
</tr>
<tr>
<td>State $\times$ qtr f.e.</td>
<td>Y</td>
</tr>
<tr>
<td>Branch f.e.</td>
<td>Y</td>
</tr>
<tr>
<td>County f.e.</td>
<td>Y</td>
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<td>117,701</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.810</td>
</tr>
</tbody>
</table>

$\Rightarrow$ Expected 100 bps Fed Funds rate increase $\rightarrow$ 22 bps savings deposit spread increase in low-versus high-competition counties

*Drechsler, Savov, and Schnabl (2016)*
Empirical strategy on lending

Do changes in deposit supply affect lending?

Identification challenge:

1. Lending decided at the bank-level ⇒ cannot control for lending opportunities using within-bank estimator

⇒ Control for bank lending opportunities by looking across different banks in the *same* county

  - Compute bank-level average HHI (average competitiveness of deposit markets in which a bank is active)
  - Identifying assumption:
    Banks face similar lending opportunities within counties

*Drechsler, Savov, and Schnabl (2016)*
Identification IV: within-county estimation

   - Available for all large banks ($\geq$ $1$ bn) at the county-bank level

2. Estimation:

\[
\Delta L_{jct} = \alpha_{jc} + \delta_{ct} + \beta HHI_{jt-1} + \gamma \Delta FF_t \times HHI_{jt-1} + \varepsilon_{jct},
\]

- \(\Delta L_{jct}\) = Total log value of loans originated
- \(\Delta FF_t\) = Change in Fed funds target rate
- \(HHI_{jt-1}\) = Bank-level exposure to deposit competition
- \(\delta_{ct}\) = County-time fixed effects

_Drechsler, Savov, and Schnabl (2016)_
Results: small business lending (bank-county)

\[ \Delta \text{Spread}_{it} = \alpha_i + \zeta_{c(i)} + \lambda_{s(i)t} + \delta_{j(i)t} + \gamma \Delta \text{Expected FF}_t \times \text{HHI}_i + \varepsilon_{it} \]

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \Delta \text{ FF } \times \text{ Bank HHI} )</td>
<td>-0.174**</td>
<td>-0.172**</td>
<td>-0.125**</td>
<td>-0.125**</td>
</tr>
<tr>
<td></td>
<td>[0.078]</td>
<td>[0.084]</td>
<td>[0.060]</td>
<td>[0.059]</td>
</tr>
<tr>
<td>( \Delta \text{ FF } \times \text{ Branch HHI} )</td>
<td>0.010</td>
<td>-0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.015]</td>
<td>[0.018]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>County-Time f.e.</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>County-Bank f.e.</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Bank f.e.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Time f.e.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>County f.e.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Observations</td>
<td>512,576</td>
<td>512,576</td>
<td>512,576</td>
<td>512,576</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.835</td>
<td>0.812</td>
<td>0.225</td>
<td>0.222</td>
</tr>
</tbody>
</table>

⇒ 100 bps Fed funds rate increase → 2.3% reduction in new small business loans for one-standard deviation increase in competition

Drechsler, Savov, and Schnabl (2016)
\[
\Delta y_{ct} = \zeta_c + \delta_t + \gamma \Delta \text{Expected FF}_t \times \text{HHI}_c + \varepsilon_{ct}
\]

<table>
<thead>
<tr>
<th></th>
<th>Log(new lending)</th>
<th>(\Delta) Employment</th>
<th>(\Delta) Wage bill</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\Delta) FF (\times) County-HHI</td>
<td>(-0.167^{***})</td>
<td>(-0.008^{***})</td>
<td>(-0.010^{***})</td>
</tr>
<tr>
<td></td>
<td>[0.030]</td>
<td>[0.003]</td>
<td>[0.004]</td>
</tr>
<tr>
<td>(\Delta) FF (\times) Branch-HHI</td>
<td>(-0.001)</td>
<td>(-0.004^{***})</td>
<td>(-0.001)</td>
</tr>
<tr>
<td></td>
<td>[0.009]</td>
<td>[0.001]</td>
<td>[0.001]</td>
</tr>
</tbody>
</table>

Time f.e. Y Y Y
County f.e. Y Y Y
Observations 57,181 57,181 57,181
R-squared 0.934 0.198 0.264

\(\Rightarrow\) 100 bps Fed funds rate increase \(\rightarrow\) 2.1% reduction in new small business loans for one-standard deviation increase in competition

Drechsler, Savov, and Schnabl (2016)
Measuring the deposit channel

How should we measure monetary policy exposure?

Novel measure: transmission depends on market power $\Rightarrow$ sufficient statistics is bank-level sensitivity of deposit spread to Fed funds rate

- Captures market power beyond HHI (e.g., consumer inattention)

1. Estimate time-series regression for each bank $i$:

$$
\Delta \text{Spread}_{it} = \alpha_i + \sum_{\tau=0}^{4} \beta_i^\tau \Delta FF_{t-\tau} + \varepsilon_{it},
$$

2. Compute bank-level spread beta: $\beta_i^{\text{Spread}} = \sum_{\tau=0}^{4} \beta_i^\tau$

3. Correlate with similarly constructed $\beta$ for deposit, security, asset, and loan growth

*Drechsler, Savov, and Schnabl (2016)*
Do banks with more market power reduce assets?

⇒ increase in spread beta (market power) from 10\textsuperscript{th} to 90\textsuperscript{th} percentile → 276 bps lower deposit growth and 194 bps reduction in assets

*Drechsler, Savov, and Schnabl (2016)*
Do banks with more market power reduce loans?

⇒ increase in spread beta (market power) from 10\textsuperscript{th} to 90\textsuperscript{th} percentile → 237 bps reduction in securities and 158 bps reduction in loans

\textit{Drechsler, Savov, and Schnabl (2016)}
Implications for credit supply

**Deposit channel:** Reduction in lending by 9.5% over business cycle
- Average deposit spread is 61 bps for each 100 bps Fed funds increase (banks at or above 95\textsuperscript{th} percentile)
- Loan-deposit spread semi-elasticity is -3.9
- Typical 400-bps Fed hiking cycle induces \(0.61 \times 3.9 \times 400 = 948\) bps reduction in bank lending

**Bank lending channel:** Similar magnitude as earlier literature
- Using time-series date, Bernanke and Blinder (1992) find that 31 bps Fed funds increase reduces deposits by 81 bps and lending by 57 bps
- Our corresponding estimates for deposits are 108 bps and 73 bps, respectively

*Drechsler, Savov, and Schnabl (2016)*
• Aggregate asset duration: 4.1 years (largest for big banks)
• Aggregate liability duration: 0.4 years $\rightarrow$ 3.7 years mismatch

Matching: Banks match interest rate sensitivity of deposits and assets
- choose asset duration to keep bank profitability stable
- hold long-term assets to reduce interest rate exposure

⇒ Explains coexistence of maturity transformation and deposit taking

Drechsler, Savov, and Schnabl (2016)
Implications for liquidity premium

⇒ As deposit supply shrinks and the price of liquid deposits increases so do other liquidity premia.

- Plots the aggregate deposit spread against the T-Bill liquidity premium (measured as Fed funds–T-Bill rate).

⇒ Higher liquidity premium raises cost of risk taking for financial sector (DSS 2015a).

*Drechsler, Savov, and Schnabl (2016)*
Additional results

1. Financial literacy (age, income, education)

2. Bank-level results on HHI and FF Rate

2. Large banks (95th percentile)

3. Competition measure (2- and 5-mile radius, hist. and yearly Herf.)

4. Alternative products (10K and 2.5K money market accounts, 10K 3- and 6-month CDs)

5. Estimation of spreads in levels
Takeaways

1. Propose and test a new channel of monetary policy

2. Deposits channel works through the effect of nominal interest rate on banks’ market power over liquidity provision to households

3. Find strong support for deposits channel using within-bank estimation, expected rate changes, and others

4. Deposits are the main source of bank funding and household liquidity. The deposits channel has implications for lending and liquidity provision

Drechsler, Savov, and Schnabl (2016)