The Fed Takes on Corporate Credit Risk:

An Analysis of the Efficacy of the SMCCF

S. Gilchrist[1] B. Wei[2] V. Yue[3] E. Zakrajšek[4]

[1]New York University and NBER

[2]Federal Reserve Bank of Atlanta

[3]Emory University, Federal Reserve Bank of Atlanta, and NBER

[4]Bank for International Settlements, Federal Reserve Board, and CEPR

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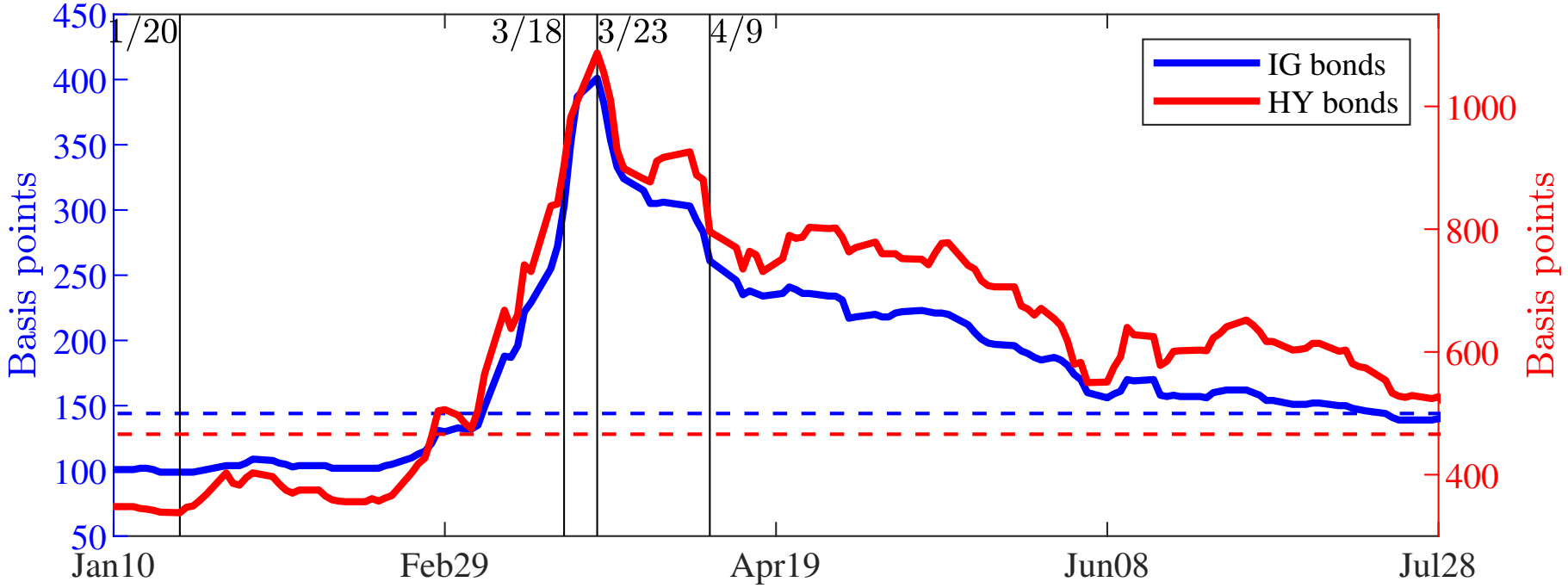
Financial Market Turmoil During Covid-19

- Severe stresses emerge in global financial markets in the early stages of pandemic:
  - **Fed's response**: cut funds rate to zero and re-introduce QE (3/15); re-launch CPFF & PDCF (3/17); and re-launch MMLF (3/18).
- Despite these actions, credit spreads continue to surge and liquidity dries up in the corporate bond market.
- To stabilize conditions and support the flow of credit to businesses and households:
  - **March 23**: Fed announces P/SMCCF; re-launches TALF and commits to open-ended QE.
  - **April 9**: Fed expands P/SMCCF and TALF and announces PPPLF, MSLF, and MLF.

U.S. Corporate Bond Market During Covid-19

Benchmark (option-adjusted) corporate bond credit spreads



NOTE: Dashed horizontal lines are 2005–present median credit spreads.
SOURCE: ICE BofA/ML indexes.

This Paper

- Creation of P/SMCCF arguably the Fed's most dramatic intervention in the economy to date.
- SMCCF announced simultaneously with other emergency measures (i.e., open-ended QE, PDCF, CPFF, etc.).
- Challenging to identify and isolate the direct effects of SMCCF on the corporate bond market.
- Using a variety of identification strategies, we quantify both announcement and purchase effects of SMCCF on credit and bid-ask spreads.

Data

- The Trade Reporting and Compliance Engine (TRACE) database contains bond-level transactions information.
  - Duration-adjusted credit spreads (Gilchrist and Zakrajsek (2012))

$$CS = y - y^f$$

y^f = YTM of a hypothetical Treasury security with matched cash flows.

  - Bid-ask spreads: for each day and each bond

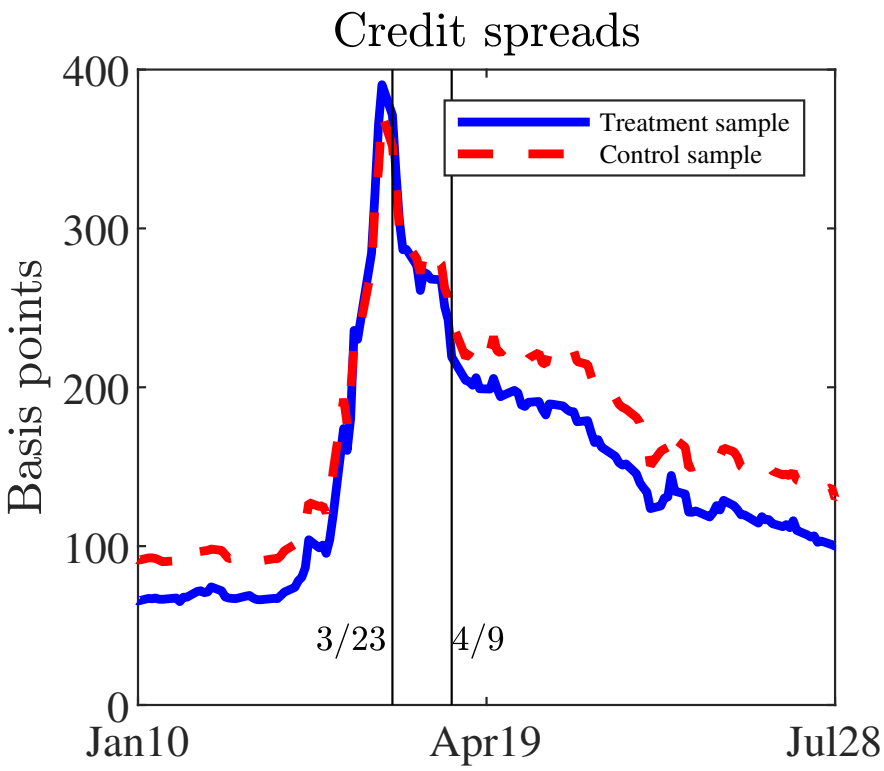
$$BAS = \frac{AvgPrice\,(D \rightarrow C) - AvgPrice\,(C \rightarrow D)}{AvgPrice\,(D \rightarrow D)}$$

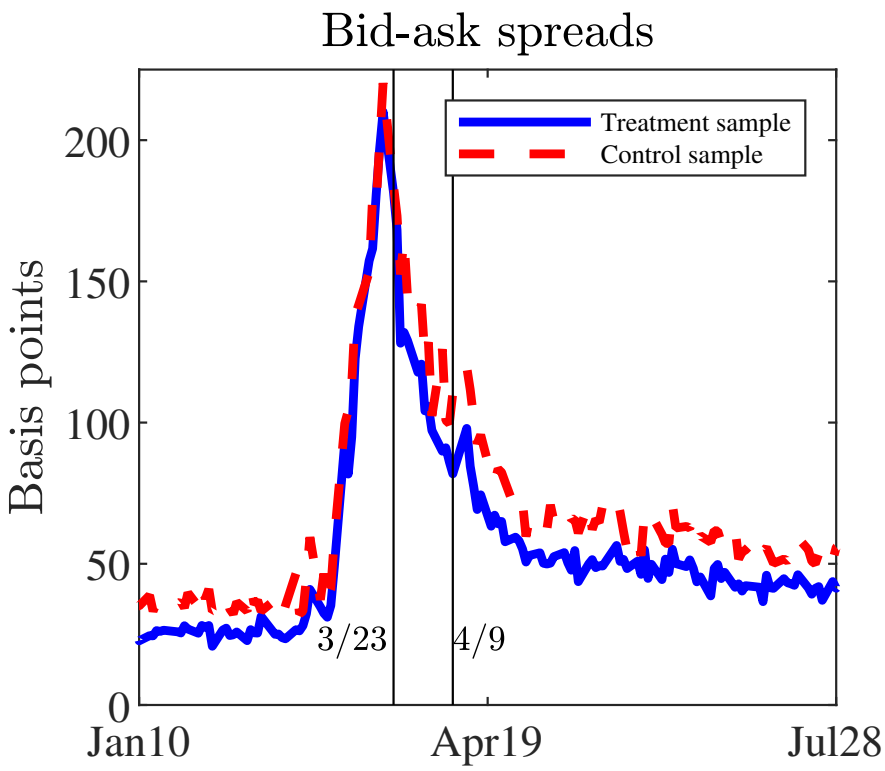
- The Fixed Income Securities Database (FISD) and Bloomberg provide bond characteristics information.

Diff-in-Diff Approach

- Construct a matched sample: “treatment” vs. “control” groups of bonds:
  - Find all bonds for each issuer with an IG rating as of March 22.
  - Select the pair of bonds with remaining maturities closest to 5 years:
    - one SMCCF eligible bond ($TTM \leq 5$) $\Rightarrow$ “treatment” group
    - one SMCCF ineligible bond ($TTM > 5$) $\Rightarrow$ “control” group
- Matched sample: 4,825 pairs of bonds, issued by 1,076 unique firms.
- The mean (median) difference in TTM across pairs of bonds is 3.5 (3.3) years.

Treatment vs. Control Groups





SOURCE: Authors' calculations using TRACE data.

Issuer-Level DiD Framework

- Issuer-level DiD (credit spread) specification:

$$CS_{i,t}^{treated} - CS_{i,t}^{control} = \beta \times \mathbf{1}\left[t \geq t^*\right] + \eta_i + \epsilon_{i,t}$$

  - $\mathbf{1}\left[t \geq t^*\right]$ = 0/1-indicator that equals 1 if $t \geq t^*$ and 0 otherwise
  - t^* = SMCCF announcement date (i.e., March 23 or April 9)

- Estimated by OLS in symmetric 1-, 5-, and 10-day windows bracketing t^*.

Issuer-Level DiD Results – Credit Spreads

	Event Window		
Explanatory Variable	1-day	5-day	10-day
A. $t^* =$ March 23			
$\mathbf{1}[t \geq t^*]$	-0.137^{**}	-0.164^{***}	-0.109^{***}
	[2.69]	[5.75]	[5.22]
R^2	0.56	0.29	0.23
Observations	1,083	4,635	9,144
B. $t^* =$ April 9			
$\mathbf{1}[t \geq t^*]$	0.023	-0.063^{***}	-0.119^{***}
	[0.78]	[4.00]	[8.51]
R^2	0.63	0.45	0.38
Observations	1,243	5,047	9,768

NOTE: Absolute t-statistics in brackets: * $p < .10$; ** $p < .05$; and *** $p < .01$.

Issuer-Level DiD Results – Bid-Ask Spreads

	Event Window		
Explanatory Variable	1-day	5-day	10-day
A. $t^* =$ March 23			
$\mathbf{1}[t \geq t^*]$	-0.062	-0.154^{**}	-0.085^{**}
	[0.51]	[2.43]	[2.16]
R^2	0.50	0.19	0.15
Observations	491	2,090	4,271
B. $t^* =$ April 9			
$\mathbf{1}[t \geq t^*]$	0.069	-0.043	-0.002
	[0.74]	[1.01]	[0.05]
R^2	0.44	0.21	0.15
Observations	547	2,625	5,109

NOTE: Absolute t-statistics in brackets: * $p < .10$; ** $p < .05$; and *** $p < .01$.

Bond-Level Panel Framework

- Bond-level (credit spread) specification:

$$\begin{aligned} CS_{i,j,t} = \beta \times \left(\mathbf{1}[j \in \text{SMCCF}] \times \mathbf{1}[t \geq t^*]\right) + \gamma_1 \times \mathbf{1}[j \in \text{SMCCF}] \\ + \gamma_2 \times \mathbf{1}[t \geq t^*] + \theta' \mathbf{X}_{i,j,t} + \eta_i + \lambda_t + \epsilon_{i,j,t} \end{aligned}$$

  - $\mathbf{X}_{i,j,t}$ = vector of controls (TTM, age, coupon, issue size)

- Estimates are very similar to DiD issuer-level estimates for both credit spreads and bid-ask spreads.

Fallen Angels: Issuer-Level DiD Framework

- Issuer-level DiD (credit spread) specification:

$$CS_{i,t}^{treated} - CS_{i,t}^{control} = \beta \times \left(\mathbf{1}[i = \text{Fallen Angel}] \times \mathbf{1}[t \geq t^*]\right) + \gamma \times \mathbf{1}[t \geq t^*] + \eta_i + \epsilon_{i,t}$$

  - $\mathbf{1}[i = \text{Fallen Angel}]$ = 0/1-indicator that equals 1 if issuer i is an eligible fallen angel and 0 otherwise (18 fallen angels).

Fallen Angels – Credit Spreads

	Event Window		
Explanatory Variable	1-day	5-day	10-day
A. $t^* =$ March 23			
$\mathbf{1}[i = \text{Fallen Angel}] \times \mathbf{1}[t \geq t^*]$	0.513	0.876	3.425**
	[0.58]	[0.87]	[2.30]
R^2	0.66	0.38	0.39
Observations	1,097	4,691	9,252
B. $t^* =$ April 9			
$\mathbf{1}[i = \text{Fallen Angel}] \times \mathbf{1}[t \geq t^*]$	−0.275	−1.233*	−2.206**
	[0.56]	[1.82]	[2.20]
R^2	0.67	0.50	0.51
Observations	1,258	5,106	9,889

NOTE: Absolute t-statistics in brackets: * $p < .10$; ** $p < .05$; and *** $p < .01$.

Fallen Angels – Bid-Ask Spreads

	Event Window		
Explanatory Variable	1-day	5-day	10-day
A. $t^* =$ March 23			
$\mathbf{1}[i = \text{Fallen Angel}] \times \mathbf{1}[t \geq t^*]$	5.224^{**}	-1.334	1.941^{***}
	[2.09]	[1.18]	[3.46]
R^2	0.50	0.20	0.15
Observations	497	2,109	4,296
B. $t^* =$ April 9			
$\mathbf{1}[i = \text{Fallen Angel}] \times \mathbf{1}[t \geq t^*]$	-3.571^{*}	-2.903^{***}	-1.765^{**}
	[1.75]	[6.55]	[2.13]
R^2	0.63	0.23	0.15
Observations	550	2,629	5,121

NOTE: Absolute t-statistics in brackets: * $p < .10$; ** $p < .05$; and *** $p < .01$.

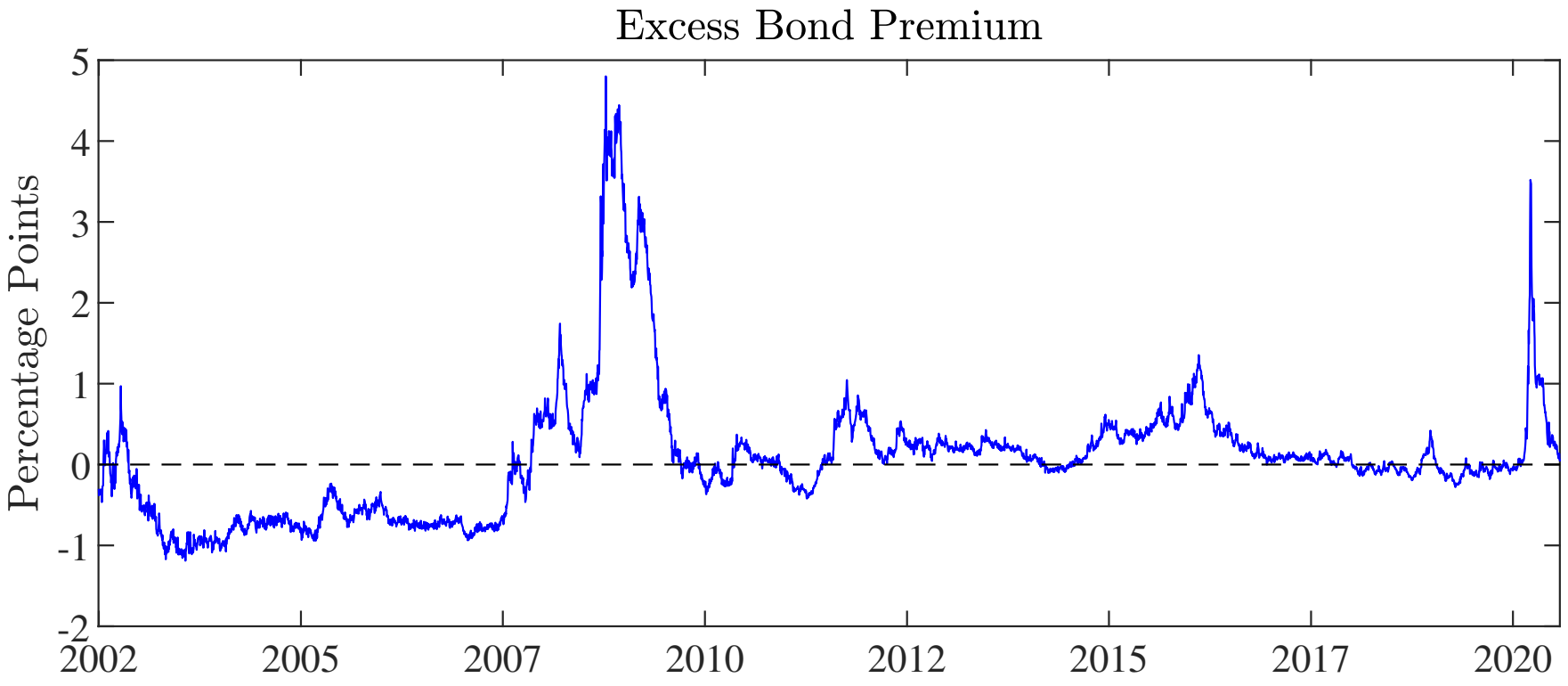
Credit Spread Decomposition

Gilchrist & Zakrajšek [2012]

- Compute daily firm-level distance-to-default based on the Merton model.
- Regress bond spreads on $\text{DD}(\tau)$ and other bond characteristics to obtain the expected default component $\widehat{\text{CS}}^{df}_{i,j,t}$:
  - Panel regression estimated between Jul2002 and Dec2019 to avoid look-ahead bias.
- Decompose credit spreads: $\text{CS}_{i,j,t} = \widehat{\text{CS}}^{df}_{i,j,t} + \text{RP}_{i,j,t}$

Excess Bond Premium (EBP)

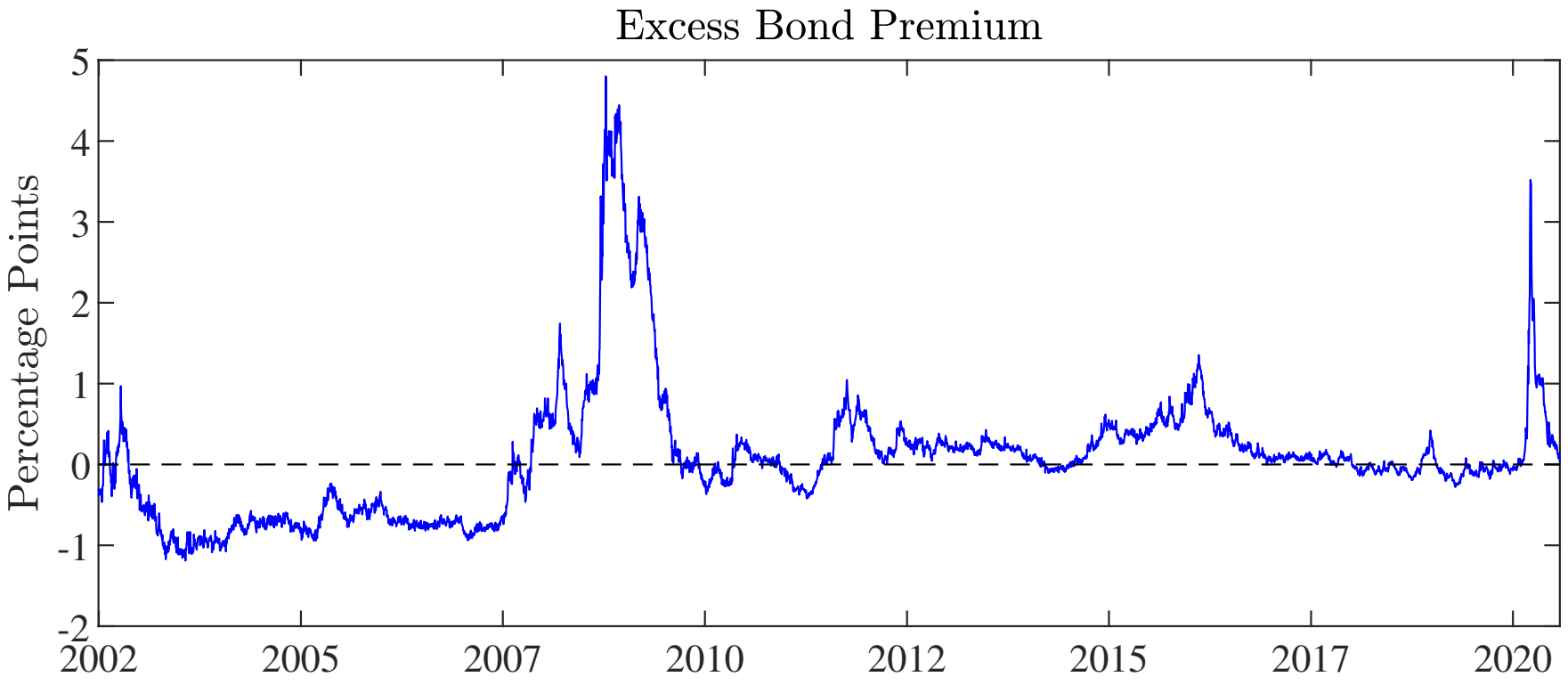
Daily TRACE data



- Possible mechanisms of the SMCCF:
  - Credit-supply channel (risk-bearing capacity of broker-dealers).
  - Disaster risk.

Excess Bond Premium (EBP)

Daily TRACE data



- Possible mechanisms of the SMCCF:
  - Credit-supply channel (risk-bearing capacity of broker-dealers).
  - Disaster risk.

Issuer-Level DiD Regressions: Risk Premium

$$\text{RP}_{i,t}^{treated} - \text{RP}_{i,t}^{control} = \beta \times \mathbf{1}[t \geq t^*] + \eta_i + \epsilon_{i,t}$$

SMCCF Announcement Effects (bps.)

	Event Window		
Explanatory Variable	1-day	5-day	10-day
A. $t^* =$ March 23			
$\mathbf{1}[t \geq t^*]$	-7	-27^{***}	-15^{***}
	[0.60]	[4.44]	[2.77]
B. $t^* =$ April 9			
$\mathbf{1}[t \geq t^*]$	-11^{***}	-9^{**}	-19^{***}
	[2.37]	[2.06]	[3.65]

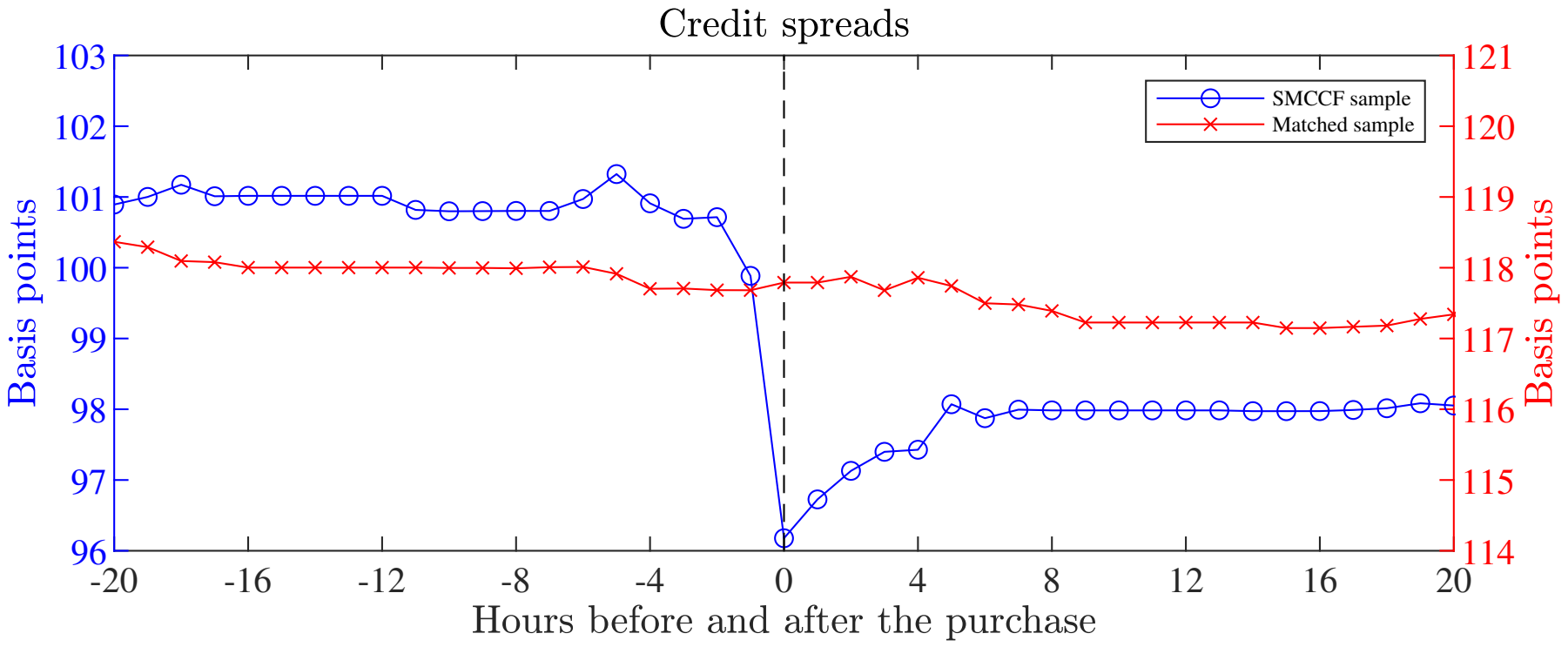
NOTE: Absolute t-statistics in brackets: * $p < .10$; ** $p < .05$; and *** $p < .01$.

- Results are stronger when using risk premium component (35 bps. vs. 20 bps. across both announcements).

SMCCF Purchases

- SMCCF started purchasing individual corporate bonds on June 16.
- Purchases attempt to track “a broad, diversified market index of U.S. corporate bonds” – Broad Market Listing (BML).
  - FRBNY announces the initial BML on June 28 (effective as of June 5).
  - Initial BML included bonds issued by 794 companies in 12 broad sectors.
- Intraday event-study to quantify the purchase effects.
  - Match purchased bond with an ineligible bond issued by the same issuer.
  - Compute average credit and bid-ask spreads in 20-hour window bracketing the purchase time.

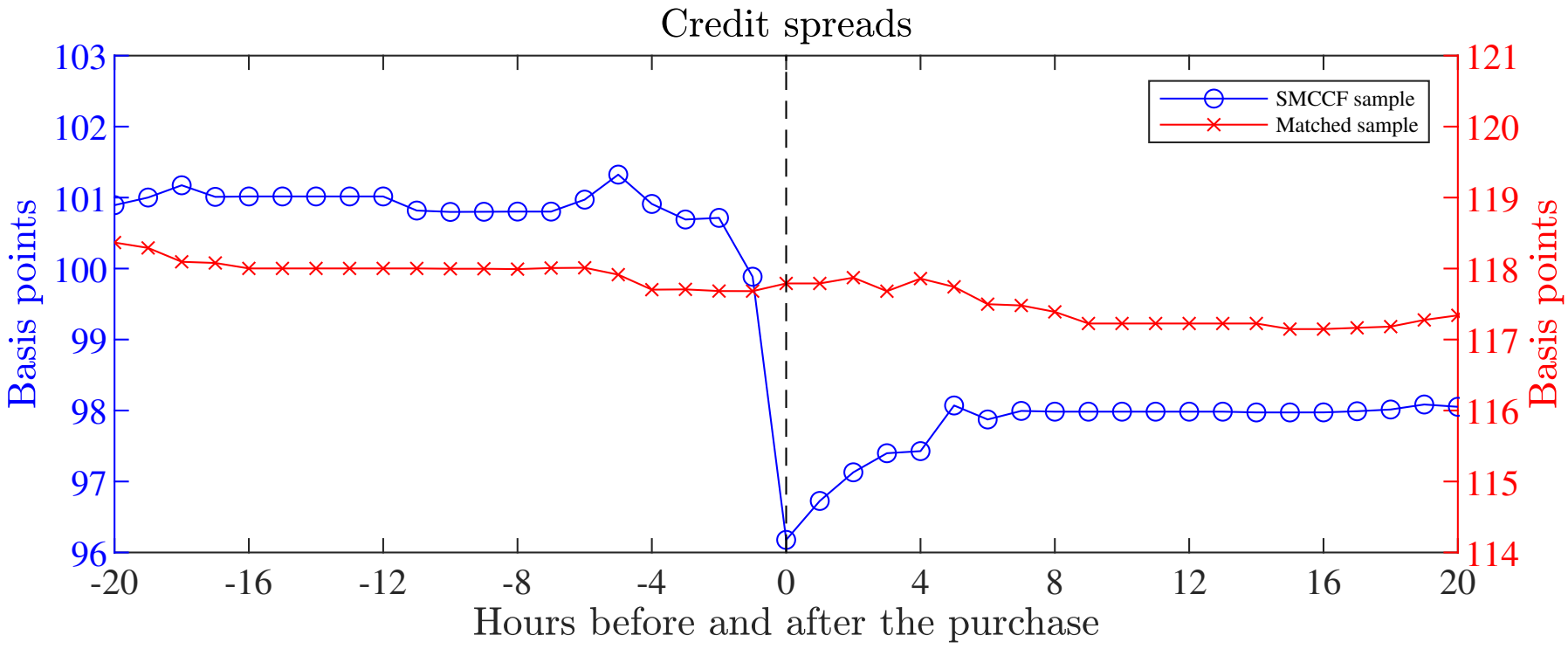
SMCCF Purchase Effects – Credit Spreads



SOURCE: Authors' calculations using TRACE data and data from FRBNY.

- SMCCF purchases reduced credit spreads 3-5 bps., on net.

SMCCF Purchase Effects – Credit Spreads



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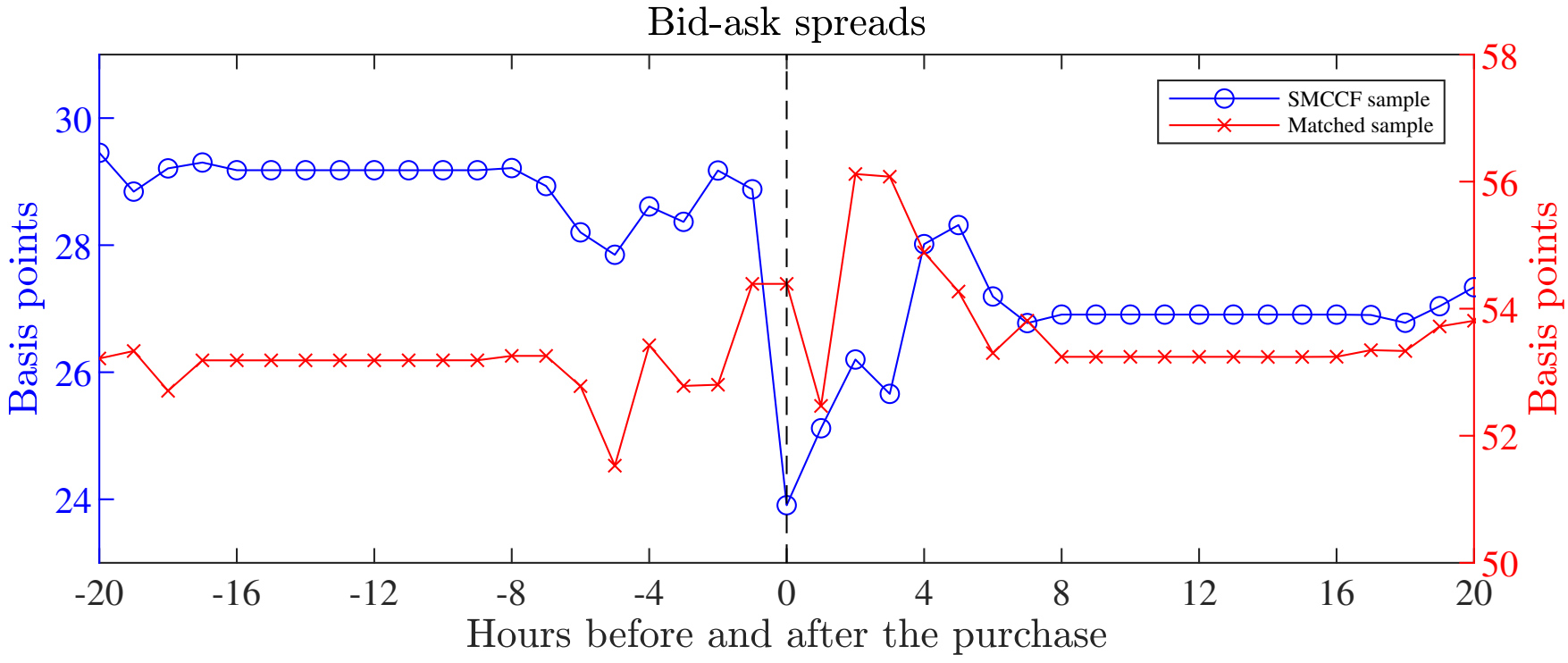
SMCCF Purchase Effects – Bid-Ask Spreads



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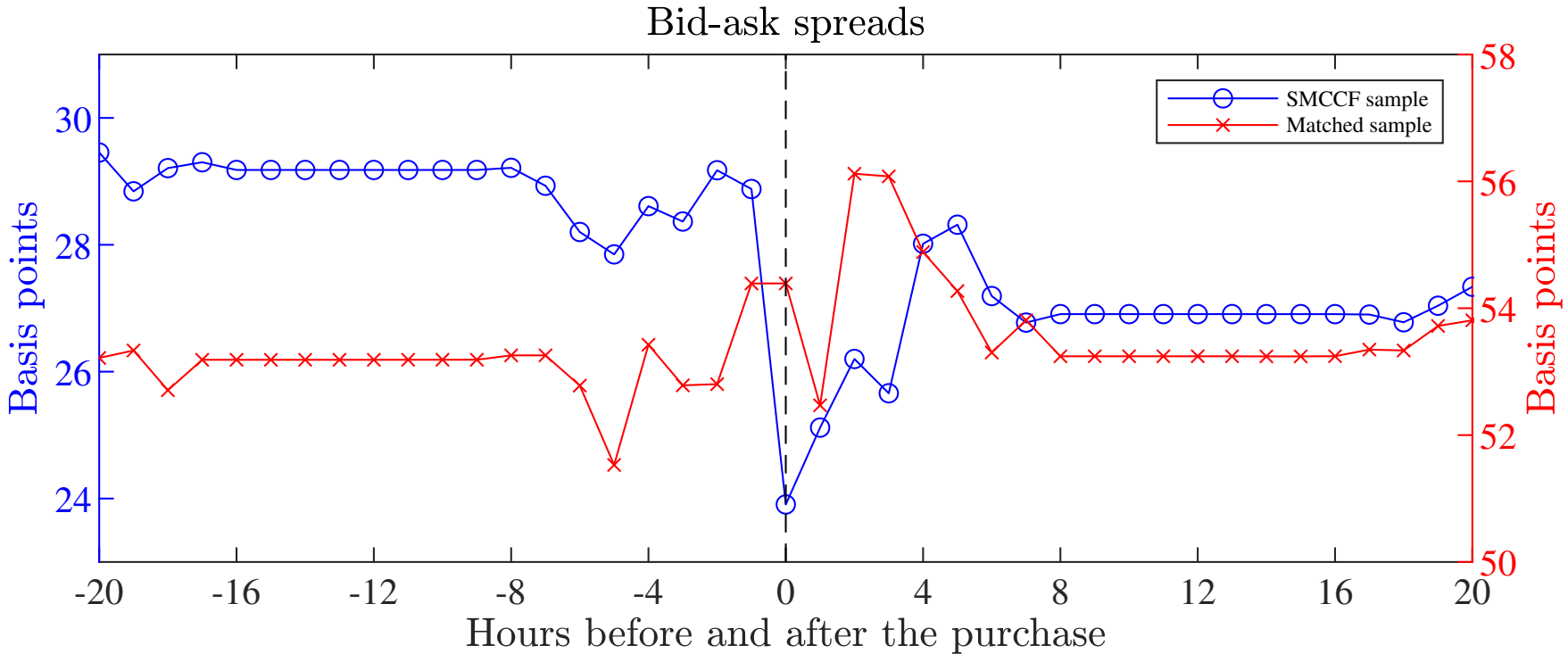
- SMCCF purchases reduced bid-ask spreads by 2 bps.

SMCCF Purchase Effects – Bid-Ask Spreads



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- SMCCF purchases reduced bid-ask spreads by 2 bps.

Summary

- Evaluation of the efficacy of the Fed's SMCCF.
- Estimate the effects of the SMCCF announcements and purchases on credit and bid-ask spreads.
  - March 23 announcement reduced credit and bid-ask spreads.
  - April 9 announcement effect concentrated on credit spreads.
    - Estimated effect on credit spreads on the order of 20-30 bps.
    - Estimated effect on bid-ask spreads 10bps.
  - April 9 announcement effectively reversed much of the run-up in credit and bid-ask spreads of fallen angels.
- The actual purchase effects are much smaller and short lived (3-5 bps).

Issuer-Level DiD Results – Credit Spreads

	Event Window		
Explanatory Variable	1-day	5-day	10-day
A. $t^* =$ March 23			
$\mathbf{1}[t \geq t^*]$	-0.258^{**}	-0.223^{**}	0.079
	$[2.05]$	$[2.20]$	$[1.19]$
R^2	0.29	0.23	0.20
Observations	1,130	4,161	7,903
B. $t^* =$ April 9			
$\mathbf{1}[t \geq t^*]$	-0.034	-0.203^{***}	-0.279^{***}
	$[0.64]$	$[4.23]$	$[5.09]$
R^2	0.43	0.38	0.35
Observations	1,152	4,319	8.217

NOTE: Absolute t-statistics in brackets: * $p < .10$; ** $p < .05$; and *** $p < .01$.

Bond-Level DiD Results – Credit Spreads

	Event Window		
Explanatory Variable	1-day	5-day	10-day
A. $t^* =$ March 23			
$\mathbf{1}[j \in \text{SMCCF}] \times \mathbf{1}[t \geq t^*]$	-0.315^{***}	-0.390^{***}	-0.215^{***}
	[5.17]	[10.08]	[5.53]
R^2	0.66	0.66	0.68
Observations	8,508	30,686	58,356
B. $t^* =$ April 9			
$\mathbf{1}[j \in \text{SMCCF}] \times \mathbf{1}[t \geq t^*]$	-0.041^{*}	-0.166^{***}	-0.289^{***}
	[1.70]	[6.49]	[9.60]
R^2	0.89	0.88	0.85
Observations	8,570	31,880	60,798

NOTE: Absolute t-statistics in brackets: * $p < .10$; ** $p < .05$; and *** $p < .01$.