**Internet Appendix of Robustness Tests for**

# "Benchmarking the Effects of the Fed's Secondary Market Corporate Credit Facility Using Yankee Bonds"

**by**

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This Appendix shows that the paper's main results regarding the SMCCF's effects on bond yield spreads and liquidity are robust to a wide variety of alternative variable construction, sampling, and estimation techniques.

## A.1 Alternative Measure of Bond Yields: Volume-weighted Bond Yields

Similar to Becker and Ivashina (2015) and Anderson and Stulz (2017), our baseline analysis employs the median yield for each bond-day to compute bond spreads. Use of the median yield can mitigate potential bias due to extreme values that often occur during turbulent markets. However, another popular method for computing a representative daily bond yield is to use a trading volume-weighted yield, e.g., Goldsmith-Pinkham et al. (2021). We therefore calculate trading volume-weighted bond yields for each bond-day observation to compute yield spreads and re-estimate our baseline specification (1).

Table A.1 presents the results using this alternative measure of yield spreads. The coefficient estimates barely change when compared to those in Table 2. For instance, the SMCCF is estimated to lower US bond yield spreads relative to Yankee bond yield spreads by 61 and 47 bps for AA-rated bonds with time to maturity below 5 years and above the 5 years, respectively. These estimates are almost the same as 64 and 51 bps relative spread reductions that were found using daily median yield spreads in Table 2. The results in Table A.1 confirms that the 5-year limit in the SMCCF's term sheet was effective only for BBB-rated bonds, and that sub-investment grade bonds are harmed for being excluded from SMCCF's bond purchase program.[1] Hence, the results from our baseline analysis are robust to this alternative measure of bond yield spreads.

## A.2 Use of a Matched Sample of US and Yankee Bonds

As indicated by the summary statistics in Table 1, US bonds account for around 93% of the sample. Except for short maturity AA-rated bonds, the bond-day observations for different rating-maturity groups are around 5 to 10 times more for US bonds compared to Yankee bonds. There might be concerns with this unbalanced sample. Although the covariates and the bond/time fixed effects should reduce possible biases to a large extent, we now construct a propensity score matched (PSM) sample of bonds to examine the robustness of our results.

Since the number of Yankee bonds is less than the number of US bonds in each rating-maturity group, we match each Yankee bond with similar US bonds. The COVID crisis was likely to have affected various industries differently. So we match each Yankee bond only to US bonds in the same rating-maturity group and that have issuers in the same two-digit SIC industry. Then we locate the closest bond(s) in terms of the amount outstanding of the bond using the Mahalanobis distance.[2] Based on

[1] The coefficient estimate in Column (16), i.e., BB-rated bonds with time to maturity above 5 years, has a p-value of 10.1%, and thus is marginally insignificant at 10% level.
[2] We obtain the amount outstanding at the beginning of 2020 for each bond from FISD. If these amounts are missing in the data, the amount outstanding is assumed to equal to the initial offering amount.

this matched sample, we re-estimate the same specification used in Table 2. The results are reported in Table A.2.

For each rating-maturity group in Table A.2, note that there are fewer observations compared to Table 2 due to the sample being matched to a smaller number of Yankee bonds. However, the results are qualitatively and quantitatively similar. For example, following the announcement of SMCCF, the decline in US bond spreads relative to matched Yankee bond spreads decline for AA-rated (A-rated) short-dated and long-dated US bonds by 45 (28) and 42 (28) bps, respectively, comparable to the 63 (41) and 51 (31) bps decline in Table 2. Also similar to the baseline results in Table 2, the yield spreads of US bonds relative to Yankee bonds rise 120 and 87 bps for sub-investment grade bonds with maturity below and above 5 years, respectively. Overall, the empirical results from the matched sample strongly support our baseline analysis.

**A.3 Controlling for Industry Fixed Effects**

If the COVID crisis affected various industries differently, another way to control for that is to re-estimate regression specification (1) using the full samples of US and Yankee bonds but control for two-digit SIC industry-by-day fixed effects. The odd-numbered columns of Table A.3 show the results of this estimation by each of the rating-maturity categories.

For bonds with maturities below 5 years, compared to Table 2's baseline AA-rated and A-rated bond regression coefficients of -0.64 and -0.41, respectively, including industry-by-day fixed effects reduces the magnitudes of the coefficients to -0.37 and -0.14, respectively, though they remain statistically significant. Yet relative to Table 2's BBB-rated bond regression coefficient of -0.89, controlling for industry-by-day fixed effects actually raises the coefficient's magnitude to -0.92. Interestingly, Table A.3 also shows that the yield spreads of US short-dated BB-rated bonds increase by 213 bps with industry-by-day fixed effects, exceeding the 119 basis point increase for these bonds given in our baseline regressions of Table 2. For bonds with maturities exceeding 5 years, controlling for industry-by-day fixed effects leads to qualitatively similar results as those found in Table 2. Overall, the results confirm the robustness of our baseline results: the SMCCF reduced yield spreads US short-dated investment-grade bonds and the best-rated US long-dated bonds. However, it clearly harmed short-dated US sub-investment grade bonds by significantly raising their spreads relative to similar-rated Yankee bonds.

**A.4 Controlling for Regional Fixed Effects**

The COVID crisis may have affected US and foreign issuers differently if it created dissimilar time-varying macroeconomic factors which drove differences in their yield spreads. Our baseline regressions reported in Table 2 control for the number of COVID cases in each issuer's country, but other macro factors may have impacted issuers located in different geographic regions. We account for this possibility by estimating regression specification (1) but controlling for issuer region-by-day fixed effects. We classify the issuers into the following regions: Western Europe, Northern Europe, Southern Europe, Oceania, and North America.[3] The identifying assumption is that countries in the same region share similar macroeconomic environments and their responses to the COVID pandemic are highly comparable. Consequently, region-by-day fixed effects control for unobserved time-varying macroeconomic characteristics that could affect the bond yield spreads across countries.

The even columns in Table A.3 report empirical estimates of how US bond yield spreads change relative to Yankee bond yield spreads following the SMCCF announcement when controlling for region-by-day fixed effects. For short-maturity bonds, the statistically significant regression

[3] Western Europe includes the Netherlands, France, Switzerland, Luxembourg, Germany, Austria, Belgium; Northern Europe includes Great Britain, Ireland, Norway, Sweden, Finland, Denmark; Southern Europe includes Italy and Spain; North America includes Canada and the US; Oceania includes Australia.

coefficients are -0.35 and -0.30 for AA- and A-rated bonds, respectively, are somewhat lower in magnitude than the comparable -0.64 and -0.41 coefficients in the baseline results of Table 2. Compared to Table 2's BBB-rated bond regression coefficient of -0.89, the coefficient is now -0.089 and becomes insignificant. In contrast, controlling for regional fixed effects raises the estimated harm that the SMCCF did to BB-rated US bonds, raising their spreads by 151 bps compared to the 119 bps baseline estimate. For long-maturity bonds, Table A.3 also shows that the SMCCF lowers yield spreads for the most credit-worthy bonds and harmed bonds with lowest credit qualities. In general, we see that controlling for region-by-day fixed effects leads to qualitatively similar results as our baseline estimates. Quantitatively, the estimates that control for regional fixed effects indicate that the SMCCF lowered short- and long-term US investment-grade bond spreads less but raised short-term US sub-investment-grade bond spreads more.

**A.5 Triple Difference During the SMCCF Announcement Window**

We apply the triple-difference specification (2) to our short-window sample of March 20, 23, and 24, 2020, rather than the January to June 2020 sample period in Table 3. The macroeconomic environments across countries are unlikely to experience a substantial change during the 3-day period. Furthermore, assuming that time-varying macroeconomic differences across countries do not differentially affect investment-grade and speculative bonds, the triple-difference specification can also mitigate their confounding impacts on bond yield spreads. Table A.4 presents the results from the triple-difference specification using this short-window sample. They are consistent with the baseline results using the longer sample period given in Table 2, but the estimated magnitudes of the SMCCF's reduction in US investment-grade yield spreads are much larger. This evidence further confirms the robustness of our results when accounting for time-varying macroeconomic environments across countries.

**A.6 Alternative measures of bond illiquidity**

Our paper focuses on two measures of bond illiquidity: the Amihud illiquidity measure and the bond-CDS basis. However, since not every bond issuer has CDS contracts traded on its debt, our analysis of the SMCCF's effects on bond liquidity using these measures employ different samples. For example, as shown in Table 7, there are relatively few BB-rated and long-maturity AA-rated Yankee bond issuers that have CDS contracts traded on their debt. Consequently, the Amihud and bond-CDS basis illiquidity measures sometimes give rise to inconsistent results.

The finance literature has proposed different measures of bond (il)liquidity, but there is yet no consensus regarding which one is best (Schestag, Schuster, and Uhrig-Homburg (2016)). Therefore, we compute two alternative illiquidity measures: the Roll (1984) measure and the imputed roundtrip cost measure of Feldhütter (2012).

Under particular assumptions, Roll (1984) shows that the bid–ask spread of a bond can be expressed as two times the square root of minus the covariance between consecutive returns:

$$ILLIQ_{Roll} = 2\sqrt{-\operatorname{cov}(r_i, r_{i-1})} \tag{A.1}$$

where $r_i = \left(P_i - P_{i-1}\right) / P_{i-1}$ is the return on the $i$th trade. Note that this measure is well-defined only if $\operatorname{cov}(r_i, r_{i-1}) \le 0$. The intuition behind equation (A.1) is that the bond price vacillates between bid and ask prices, and a larger bid-ask spread results in higher negative covariance between the returns of consecutive trades (Dick-Nielsen, Feldhütter, and Lando (2012)). Similar to our calculation of Amihud's measure, we compute a bond's Roll measure using its trades over a week and require at least four transactions in the week for the calculation to be feasible.

Feldhütter (2012) proposed an alternative illiquidity measure using trade prices to compute a roundtrip transaction cost. We follow Dick-Nielsen, Feldhütter, and Lando (2012) and define roundtrip trades of a bond as two or three trades with exactly the same trade size on the same day. The imputed roundtrip cost (IRC) associated with the roundtrip trades is:

$$IRC = \frac{P_{max} - P_{min}}{P_{min}} \tag{A.2}$$

where $P_{max}$ and $P_{min}$ are the largest and smallest prices in the roundtrip trades. A higher IRC indicates that the bond is less liquid. If a bond has multiple roundtrip trades with different trade sizes, the daily IRC is the simple average of all IRCs. In order to be consistent with Amihud's measure and Roll's measure, we also compute the weekly average of IRC for each bond.

We re-estimate our paper's specification (5) with the Roll and IRC measures, and the results are given in Tables A.5 and A.6, respectively. Both tables show that AA-rated US bonds, regardless of their maturities, experience significant improvement in liquidity relative to Yankee bonds following the SMCCF announcement. On the other hand, the liquidity of other US bonds only marginally improves or, for some rating-maturity groups, deteriorates. Overall, both alternative measures of bond illiquidity support the results using Amihud's measure in that the positive effect of SMCCF on US bond liquidity is most pronounced among the highest credit quality bonds.

**References**


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**Table A.1: The Effect of SMCCF on Bond Volume-Weighted Yield Spreads**

This table shows DiD estimates for each rating and time-to-maturity group of bonds. The data are daily corporate bond transactions from January 2020 to June 2020. The dependent variable is the trading-volume-weighted bond yield spreads. The indicator US equals 1 if the bond is issued by a US company, and 0 otherwise. The indicator SMCCF equals 1 if the transaction occurs on and after March 23rd 2020. Ln(quantity) is the natural logarithm of the bond transaction quantity in US dollars. COVID cases is 14-day cumulative number of COVID-19 cases per 100,000 population. Columns 1 to 16 present DiD estimates for bond groups (AA, ttm<5 yrs), (A, ttm<5 yrs), (BBB, ttm<5 yrs), (BB, ttm<5 yrs) , (AA, ttm ≥5 yrs), (A, ttm ≥5 yrs), (BBB, ttm ≥5 yrs) and (BB, ttm ≥5 yrs), respectively. All specifications include bond and trading day fixed effects. Robust standard errors are clustered at the bond and trading day level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

| | *Bond Yield Spreads* | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AA < 5 yrs | AA < 5 yrs | A < 5 yrs | A < 5 yrs | BBB < 5 yrs | BBB < 5 yrs | BB < 5 yrs | BB < 5 yrs | AA >5 yrs | AA >5 yrs | A >5 yrs | A >5 yrs | BBB >5 yrs | BBB >5 yrs | BB >5 yrs | BB >5 yrs |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| US×SMCCF | -0.309*** | -0.610*** | -0.208*** | -0.412*** | -0.761*** | -0.882*** | 0.788*** | 1.042*** | -0.409*** | -0.466*** | -0.206*** | -0.335*** | -0.140 | -0.113 | 0.079 | 0.499 |
| | (0.054) | (0.073) | (0.053) | (0.077) | (0.218) | (0.263) | (0.239) | (0.322) | (0.034) | (0.053) | (0.049) | (0.069) | (0.115) | (0.146) | (0.294) | (0.304) |
| Ln(quantity) | | -0.015*** | | -0.011*** | | -0.005 | | -0.024 | | -0.009*** | | -0.005*** | | 0.003 | | -0.001 |
| | | (0.003) | | (0.002) | | (0.004) | | (0.018) | | (0.002) | | (0.001) | | (0.002) | | (0.009) |
| Time to maturity | | 45.138 | | -78.414 | | -96.399* | | 316.489 | | 49.299 | | -49.507* | | -33.439 | | 38.173 |
| | | (67.262) | | (64.009) | | (51.896) | | (255.098) | | (53.621) | | (29.282) | | (34.024) | | (169.208) |
| COVID cases | | 0.005*** | | 0.005*** | | 0.003 | | -0.004 | | 0.001 | | 0.003*** | | -0.001 | | -0.007*** |
| | | (0.001) | | (0.001) | | (0.002) | | (0.005) | | (0.001) | | (0.001) | | (0.001) | | (0.001) |
| Bond FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Day FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 17,063 | 17,063 | 70,070 | 70,070 | 111,043 | 111,043 | 23,586 | 23,586 | 14,468 | 14,468 | 96,427 | 96,427 | 152,632 | 152,632 | 26,365 | 26,365 |
| $R^2$ | 0.723 | 0.733 | 0.728 | 0.730 | 0.727 | 0.728 | 0.718 | 0.718 | 0.844 | 0.845 | 0.811 | 0.812 | 0.832 | 0.832 | 0.819 | 0.819 |

## Table A.2: The Effect of SMCCF on Matched Sample Bond Yield Spreads

This table shows the DiD estimates for each rating and time-to-maturity group of bonds. The data are daily corporate bond transactions from January 2020 to June 2020. For each Yankee bond, we consider US bonds in the same rating-maturity group and US issuers in the same two-digit SIC industry group. We then locate the closest bond(s) in terms of the bonds' amount outstanding using the Mahalanobis distance. The indicator US equals 1 if the bond is issued by a US company, and 0 otherwise. The indicator SMCCF equals 1 if the transaction occurs on and after March 23rd 2020. Ln(quantity) is the natural logarithm of the bond transaction quantity in US dollars. COVID cases is 14-day cumulative number of COVID-19 cases per 100,000 population. Columns 1 to 16 present DiD estimates for bond groups (AA, ttm<5 yrs), (A, ttm<5 yrs), (BBB, ttm<5 yrs), (BB, ttm<5 yrs) , (AA, ttm ≥5 yrs), (A, ttm ≥5 yrs), (BBB, ttm ≥5 yrs) and (BB, ttm ≥5 yrs), respectively. All specifications include bond and trading day fixed effects. Robust standard errors are clustered at the bond and trading day level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

| | *Bond Yield Spreads* | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AA < 5 yrs | AA < 5 yrs | A < 5 yrs | A < 5 yrs | BBB < 5 yrs | BBB < 5 yrs | BB < 5 yrs | BB < 5 yrs | AA >5 yrs | AA >5 yrs | A >5 yrs | A >5 yrs | BBB >5 yrs | BBB >5 yrs | BB >5 yrs | BB >5 yrs |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| US×SMCCF | -0.220** | -0.451*** | -0.143* | -0.278*** | -1.096*** | -1.103*** | 1.313* | 1.203** | -0.388*** | -0.416*** | -0.163** | -0.275*** | -0.086 | 0.027 | 0.230 | 0.869 |
| | (0.095) | (0.134) | (0.074) | (0.106) | (0.292) | (0.373) | (0.742) | (0.519) | (0.048) | (0.073) | (0.067) | (0.101) | (0.131) | (0.163) | (0.425) | (0.533) |
| Ln(quantity) | | -0.001 | | -0.013*** | | 0.001 | | 0.061 | | -0.007*** | | -0.004* | | 0.005 | | 0.015 |
| | | (0.003) | | (0.004) | | (0.008) | | (0.064) | | (0.002) | | (0.002) | | (0.004) | | (0.024) |
| Time to maturity | | -71.805 | | -126.718 | | -397.902* | | -161.439 | | 58.045 | | -72.025 | | -54.013 | | 432.437 |
| | | (111.015) | | (127.146) | | (215.382) | | (727.770) | | (97.091) | | (57.829) | | (114.177) | | (299.229) |
| COVID cases | | 0.004*** | | 0.003*** | | 0.0001 | | 0.002 | | 0.0005 | | 0.002** | | -0.002** | | -0.012*** |
| | | (0.001) | | (0.001) | | (0.003) | | (0.009) | | (0.001) | | (0.001) | | (0.001) | | (0.004) |
| Bond FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Day FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,063 | 4,063 | 9,637 | 9,637 | 13,306 | 13,306 | 2,612 | 2,612 | 3,416 | 3,416 | 9,485 | 9,485 | 20,307 | 20,307 | 2,996 | 2,996 |
| $R^2$ | 0.855 | 0.859 | 0.790 | 0.792 | 0.765 | 0.765 | 0.758 | 0.759 | 0.944 | 0.944 | 0.873 | 0.875 | 0.844 | 0.844 | 0.869 | 0.877 |

## Table A.3: The Effect of SMCCF on Bond Yield Spreads with Industry and Region Fixed Effects

This table shows DiD estimates for each rating and time-to-maturity group of bonds. The data are daily corporate bond transactions from January 2020 to June 2020. The indicator US equals 1 if the bond is issued by a US company, and 0 otherwise. The indicator SMCCF equals 1 if the transaction occurs on and after March 23rd 2020. Ln(quantity) is the natural logarithm of the bond transaction quantity in US dollars. COVID cases is 14-day cumulative number of COVID-19 cases per 100,000 population. Columns 1 to 16 present DiD estimates for bond groups (AA, ttm<5 yrs), (A, ttm<5 yrs), (BBB, ttm<5 yrs), (BB, ttm<5 yrs) , (AA, ttm ≥5 yrs), (A, ttm ≥5 yrs), (BBB, ttm ≥5 yrs) and (BB, ttm ≥5 yrs), respectively. For each rating group, the table reports the results from the specifications that include industry (2-digit SIC)-by-day and region-by-day fixed effects, respectively. Robust standard errors are clustered at the bond and trading day level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively

| | *Bond Yield Spreads* | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AA < 5 yrs | AA < 5 yrs | A < 5 yrs | A < 5 yrs | BBB < 5 yrs | BBB < 5 yrs | BB < 5 yrs | BB < 5 yrs | AA >5 yrs | AA >5 yrs | A >5 yrs | A >5 yrs | BBB >5 yrs | BBB >5 yrs | BB >5 yrs | BB >5 yrs |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| US×SMCCF | -0.372*** | -0.352*** | -0.138** | -0.295* | -0.924*** | -0.089 | 2.127*** | 1.508** | -0.397*** | -0.100 | -0.125** | -0.512*** | -0.299** | -0.099 | 0.792*** | 1.190*** |
| | (0.127) | (0.066) | (0.064) | (0.160) | (0.331) | (0.563) | (0.787) | (0.680) | (0.080) | (0.252) | (0.049) | (0.113) | (0.148) | (0.225) | (0.286) | (0.120) |
| Ln(quantity) | -0.009*** | -0.010*** | -0.010*** | -0.010*** | -0.010*** | -0.005* | -0.024** | -0.013 | -0.005*** | -0.006*** | -0.003*** | -0.003*** | -0.0001 | 0.002* | 0.002 | 0.001 |
| | (0.002) | (0.002) | (0.001) | (0.001) | (0.002) | (0.003) | (0.010) | (0.016) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.005) | (0.007) |
| Time to maturity | -65.652 | -64.643 | -6.221 | -4.414 | -137.310** | -161.235** | 59.018 | 224.141 | 33.987 | 43.494 | -46.357** | -51.963** | -20.157 | -44.818 | 22.082 | 29.176 |
| | (64.389) | (65.565) | (42.461) | (43.213) | (62.910) | (65.896) | (241.149) | (258.066) | (30.105) | (36.012) | (21.958) | (22.858) | (27.512) | (29.980) | (115.656) | (131.737) |
| COVID cases | 0.003*** | 0.002** | 0.002** | 0.003* | 0.002 | -0.007 | -0.038*** | -0.005 | 0.001 | -0.001 | 0.001 | 0.006** | -0.0004 | -0.003* | -0.014*** | -0.009*** |
| | (0.001) | (0.001) | (0.001) | (0.002) | (0.002) | (0.006) | (0.013) | (0.006) | (0.001) | (0.002) | (0.001) | (0.002) | (0.001) | (0.002) | (0.004) | (0.001) |
| Bond FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry × Day FE | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Region × Day FE | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 17,063 | 17,063 | 70,070 | 70,070 | 109,441 | 111,043 | 23,345 | 23,586 | 14,468 | 14,468 | 96,275 | 96,427 | 150,359 | 152,632 | 26,152 | 26,365 |
| $R^2$ | 0.861 | 0.819 | 0.822 | 0.789 | 0.827 | 0.769 | 0.887 | 0.748 | 0.947 | 0.921 | 0.884 | 0.855 | 0.905 | 0.851 | 0.917 | 0.849 |

**Table A.4: Triple Difference Analysis: A Short Time Window**

This table shows DiDiD estimates for each rating and time-to-maturity group of investment grade bonds relative to BB-rated bonds. The data are intra-day corporate bond transactions on March 20th, 23rd and 24th. The indicator US equals 1 if the bond is issued by a US company, and 0 otherwise. The indicator SMCCF equals 1 if the transaction occurs on and after March 23rd 2020. The indicator IG equals 1 if the bond is investment-grade when traded and 0 otherwise. Ln(quantity) is the natural logarithm of the bond transaction quantity in US dollars. COVID cases is the 14-day cumulative number of COVID-19 cases per 100,000 population. Columns 1, 2, 3, 4, 5 and 6 present DiDiD estimates for bond groups (AA, ttm<5 yrs), (A, ttm<5 yrs), (BBB, ttm<5 yrs), (AA, ttm ≥5 yrs), (A, ttm ≥5 yrs) and (BBB, ttm ≥5 yrs), respectively. All specifications include country of domicile and trading day fixed effects. Heteroskedasticity-autocorrelation robust standard errors are reported in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

| | *Bond Yield Spreads* | | | | | |
|---|---|---|---|---|---|---|
| | AA < 5 yrs | A < 5 yrs | BBB < 5 yrs | AA >5 yrs | A >5 yrs | BBB >5 yrs |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| US×SMCCF×IG | -3.108*** | -4.403*** | -4.892*** | -0.792*** | -1.993*** | -0.782*** |
| | (0.478) | (0.439) | (0.476) | (0.177) | (0.176) | (0.187) |
| US×SMCCF | 2.124*** | 3.276*** | 3.208*** | -0.123 | 0.944*** | 0.670*** |
| | (0.473) | (0.438) | (0.442) | (0.181) | (0.167) | (0.159) |
| SMCCF×IG | -7.156*** | -5.732*** | -2.691*** | -4.565*** | -3.494*** | -2.980*** |
| | (0.442) | (0.412) | (0.447) | (0.164) | (0.166) | (0.176) |
| Ln(quantity) | -1.277*** | -0.429*** | -0.360*** | -1.151*** | -0.466*** | -0.497*** |
| | (0.099) | (0.039) | (0.039) | (0.038) | (0.016) | (0.012) |
| Time to maturity | -0.578*** | -0.426*** | -0.723*** | -0.038*** | -0.028*** | -0.033*** |
| | (0.050) | (0.028) | (0.060) | (0.005) | (0.003) | (0.003) |
| COVID cases | -0.002 | -0.006** | -0.012** | -0.012*** | -0.003 | -0.009*** |
| | (0.007) | (0.003) | (0.006) | (0.002) | (0.002) | (0.001) |
| Country FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Day FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 14,672 | 31,530 | 37,869 | 11,078 | 23,532 | 30,895 |
| $R^2$ | 0.265 | 0.265 | 0.051 | 0.439 | 0.430 | 0.255 |

## Table A.5: The Effect of SMCCF on Bond Liquidity Using the Roll Measure

This table presents estimates of panel regressions of bond liquidity on the interaction of indicator SMCCF and indicator US for each rating and time-to-maturity group of bonds. The data are daily corporate bond transactions from January 2020 to June 2020. Bond liquidity is calculated based on Roll (1984) using weekly transaction data. The indicator US equals 1 if the bond is issued by a US company, and 0 otherwise. The indicator SMCCF equals 1 if the transaction occurs on and after March 23rd 2020. Ln(quantity) is the natural logarithm of the bond transaction quantity in US dollars. COVID cases is 14-day cumulative number of COVID-19 cases per 100,000 population. Columns 1 to 16 present DiD estimates for bond groups (AA, ttm<5 yrs), (A, ttm<5 yrs), (BBB, ttm<5 yrs) , (BB, ttm<5 yrs), (AA, ttm ≥5 yrs), (A, ttm ≥5 yrs), (BBB, ttm ≥5 yrs) and (BB, ttm ≥5 yrs), respectively. All specifications include bond and trading day fixed effects. Robust standard errors are clustered at the bond and trading day level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

| | *Roll's Measure* | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AA < 5 yrs | AA < 5 yrs | A < 5 yrs | A < 5 yrs | BBB < 5 yrs | BBB < 5 yrs | BB < 5 yrs | BB < 5 yrs | AA >5 yrs | AA >5 yrs | A >5 yrs | A >5 yrs | BBB >5 yrs | BBB >5 yrs | BB >5 yrs | BB >5 yrs |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| US×SMCCF | -0.001*** | -0.003*** | -0.001* | -0.002** | -0.001 | -0.003** | 0.002* | 0.003** | -0.004*** | -0.011*** | -0.001 | -0.002 | -0.001 | -0.001 | 0.0002 | 0.001 |
| | (0.0003) | (0.001) | (0.0003) | (0.001) | (0.001) | (0.002) | (0.001) | (0.002) | (0.001) | (0.004) | (0.001) | (0.001) | (0.001) | (0.002) | (0.001) | (0.002) |
| Ln(quantity) | | -0.0001*** | | -0.0001*** | | -0.0001*** | | -0.0002*** | | -0.0003*** | | -0.0003*** | | -0.0002*** | | -0.0004*** |
| | | (0.00002) | | (0.00002) | | (0.00002) | | (0.00004) | | (0.0001) | | (0.00004) | | (0.00003) | | (0.0001) |
| Time to maturity | | -0.351 | | 0.400 | | 1.289 | | 2.802 | | -5.511** | | 0.882 | | -1.616* | | -2.957* |
| | | (0.366) | | (0.439) | | (1.016) | | (1.982) | | (2.598) | | (1.073) | | (0.902) | | (1.721) |
| COVID cases | | 0.00004*** | | 0.00002** | | 0.0001** | | -0.00002 | | 0.0001** | | 0.00002 | | 0.00000 | | -0.00002 |
| | | (0.00001) | | (0.00001) | | (0.00002) | | (0.00004) | | (0.00005) | | (0.00002) | | (0.00003) | | (0.00003) |
| Bond FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Day FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 15,436 | 15,436 | 60,654 | 60,654 | 95,439 | 95,439 | 20,958 | 20,958 | 12,326 | 12,326 | 74,278 | 74,278 | 124,648 | 124,648 | 23,286 | 23,286 |
| $R^2$ | 0.466 | 0.480 | 0.414 | 0.416 | 0.413 | 0.414 | 0.423 | 0.425 | 0.399 | 0.410 | 0.421 | 0.422 | 0.386 | 0.387 | 0.365 | 0.366 |

## Table A.6: The Effect of SMCCF on Bond Liquidity Using Imputed Roundtrip Cost

This table presents estimates of panel regressions of bond liquidity on the interaction of indicator SMCCF and indicator US for each rating and time-to-maturity group of bonds. The data are daily corporate bond transactions from January 2020 to June 2020. Bond illiquidity is an imputed roundtrip cost calculation based on Feldhütter (2012) using weekly transaction data. The indicator US equals 1 if the bond is issued by a US company, and 0 otherwise. The indicator SMCCF equals 1 if the transaction occurs on and after March 23rd 2020. Ln(quantity) is the natural logarithm of the bond transaction quantity in US dollars. COVID cases is 14-day cumulative number of COVID-19 cases per 100,000 population. Columns 1 to 16 present DiD estimates for bond groups (AA, ttm<5 yrs), (A, ttm<5 yrs), (BBB, ttm<5 yrs) , (BB, ttm<5 yrs), (AA, ttm ≥5 yrs), (A, ttm ≥5 yrs), (BBB, ttm ≥5 yrs) and (BB, ttm ≥5 yrs), respectively. All specifications include bond and trading day fixed effects. Robust standard errors are clustered at the bond and trading day level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

| | *Imputed Roundtrip Cost* | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AA < 5 yrs | AA < 5 yrs | A < 5 yrs | A < 5 yrs | BBB < 5 yrs | BBB < 5 yrs | BB < 5 yrs | BB < 5 yrs | AA >5 yrs | AA >5 yrs | A >5 yrs | A >5 yrs | BBB >5 yrs | BBB >5 yrs | BB >5 yrs | BB >5 yrs |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| US×SMCCF | -0.0002*** | -0.0004*** | -0.0001 | -0.0002 | -0.0002** | -0.0001 | 0.0002 | 0.001** | -0.001** | -0.001** | 0.00001 | 0.0003 | 0.0001 | 0.0002 | 0.001* | 0.001*** |
| | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0003) | (0.0004) | (0.0002) | (0.001) | (0.0001) | (0.0003) | (0.0002) | (0.0003) | (0.0003) | (0.001) |
| Ln(quantity) | | -0.00001 | | -0.00002*** | | -0.00002*** | | -0.00001 | | -0.0001*** | | -0.0001*** | | -0.0001*** | | -0.00002 |
| | | (0.00001) | | (0.00001) | | (0.00001) | | (0.00002) | | (0.00002) | | (0.00001) | | (0.00001) | | (0.00003) |
| Time to maturity | | 0.233 | | 0.113 | | 0.053 | | 0.235 | | -0.221 | | 0.996 | | -0.104 | | -0.247 |
| | | (0.419) | | (0.285) | | (0.292) | | (0.856) | | (1.014) | | (0.606) | | (0.513) | | (1.061) |
| COVID cases | | 0.00000 | | 0.00000 | | -0.00000 | | 0.00001 | | 0.00001 | | -0.00001* | | -0.00000 | | 0.00001** |
| | | (0.00000) | | (0.00000) | | (0.00000) | | (0.00001) | | (0.00001) | | (0.00000) | | (0.00000) | | (0.00001) |
| Bond FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Day FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 14,141 | 14,141 | 57,120 | 57,120 | 92,002 | 92,002 | 20,180 | 20,180 | 10,665 | 10,665 | 63,053 | 63,053 | 108,925 | 108,925 | 21,878 | 21,878 |
| $R^2$ | 0.110 | 0.110 | 0.101 | 0.102 | 0.128 | 0.128 | 0.154 | 0.155 | 0.116 | 0.119 | 0.166 | 0.167 | 0.167 | 0.167 | 0.209 | 0.209 |