Unexpected Corporate Bond Demand and Firm Acquisition Activity

April Meehl*and Shannon Sledz‡

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Abstract

In March 2020, the Federal Reserve's Primary and Secondary Market Corporate Credit Facilities abruptly lowered effective bond financing costs for investment-grade rated firms. We ask whether this shock increased cash acquisitions following bond issuance for the treated firms. We assemble firm-level Compustat–CRSP–FISD–SDC data from 2017–2023 and estimate a triple difference-in-differences specification exploiting IG status, the treatment period of 2020, and the number of bonds issued. For IG firms that issued in 2020, the probability of announcing a cash acquisition did not significantly differ from that of non-IG firms who issued in the same period. However, announcement cumulative abnormal returns for these treated acquisitions were higher than those announced by non-IG issuers, consistent with more selective dealmaking rather than a collapse in acquisition activity.

Keywords: mergers and acquisitions, corporate liquidity, corporate bonds

*Corresponding Author. Haverford College. Contact: aprilmeehl@gmail.com.

†University of Wisconsin-Madison. Contact: ssledz@wisc.edu.

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1 Introduction

In March of 2020, the Federal Reserve intervened in the corporate bond market for the first time ever with the announcement of the Primary and Secondary Market Corporate Credit Facilities (CCFs)[1]. These facilities provided the Fed with funds to purchase corporate bonds on both the primary and secondary markets in an effort to stabilize the markets following turmoil spurred by the COVID-19 pandemic. After the announcement of these programs, a record breaking number of corporate bonds were issued, providing an influx of cash to issuing firms (Darmouni and Siani (2023)).

The announcement of the CCFs altered effective access to external financing via the corporate bond market during a time of macroeconomic uncertainty. In addition, only bonds issued by firms with investment-grade (IG) ratings were eligible to be bought, creating additional heterogeneity in this credit market access shock. Harford and Uysal (2014) prove that firms with access to the corporate bond market engage in more acquisitions than firms without ratings, and in the data, we see a rise in acquisition announcements following the spike in bond issuances (Figure 1). Therefore, in this paper, we explore the possibility of the CCFs further expanding the credit market access of eligible firms and the impact this had on their acquisition activity. As this was the first such intervention in the corporate bond market by the Fed, it is important to study the various impacts it could have on financial markets and the real economy. Increased acquisition activity may have been welfare-improving if acquired firms were unlikely to survive the COVID-19 recession and acquisitions provided a more efficient reallocation of labor and resources than bankruptcy proceedings. However, the intervention specifically favored IG-rated firms, who are typically larger and have more market power. Increased acquisition activity by these firms may further reduce competition in their industries and lead to higher markups.

We build a novel dataset consisting of firm-level balance sheet, income statement, credit

[1]PMCCFs: `https://www.federalreserve.gov/monetarypolicy/PMCCF.htm`, SMCCF: `https://www.federalreserve.gov/newsevents/pressreleases/files/monetary20200728a1.pdf`. More information can be found in Section A.

ratings, bond issuance activity, acquisition activity, and stock return data. To test the effect of the CCFs on acquisition activity, we conduct a triple difference-in-differences analysis of cash acquisition likelihood following bond issuance by IG-rated firms, before and after the announcement of the CCFs. Studying all cash acquisitions, we find no significant difference in acquisition announcement by treated and non-treated firms following bond issuances in 2020. We do find that treated firms are less likely to announce the cash acquisition of a public target after 2020 bond issuance compared to non-treated firms. This is contrary to our hypothesis that the CCFs would lead to more acquisition activity by treated firms. In fact, we do find that firms that issued bonds in 2020 were more likely to announce acquisitions in the following year compared to their likelihood following other bond issuances, but that the effect is dampened for the IG-rated firms.

To better understand the results, we focus on the market perception of the cash acquisitions that did occur. Harford and Uysal (2014) study the market perception of acquisitions by firms with ratings and determine that the increase in acquisitions is aligned with less effective monitoring due to greater dispersion of investors, and not due to the ability to fund more positive NPV acquisitions. Therefore, we also study the market perception of the acquisitions announced by treated firms after the announcement of the CCFs to understand if the acquisitions are more value-increasing or value-decreasing deals. We find that acquisitions by IG-rated firms following a 2020 bond issuance were perceived more favorably than acquisitions by non-IG firms who also issued in 2020. However, we find no significant difference in the abnormal returns of a cash acquisition announcement by the IG firms following a 2020 bond issuance compared to a one following any other bond issuance. Our results suggest that the CCFs may not have had adverse consequences on the acquisition activity of the firms it targeted, but that it may have negatively impacted the acquisition activity of the non-targeted firms instead.

Related Literature Our paper contributes to the literature on the financing of merger and acquisition (M&A) activity. Malmendier et al. (2016) documents the rising proportion of M&A deals executed via cash while Rempel (2020) shows that this trend is driving by the speed ad-

vantage of completing a M&A deal in cash relative to stock. Harford (2004) finds that merger waves depend on whether or not there is sufficient capital liquidity, proxied for with spreads on commerical & industrial loans, to fund such deals. Harford and Uysal (2014) then finds that firms with access to the corporate bond market are more likely to acquire than those without access. Our paper studies a shock to firms' effective access to the credit market and its impact on acquisition activity. Furthermore, our paper contributes to the mostly under explored literature of bond issuance and M&A activity. Both Acharya et al. (2024) and Gulen et al. (2022) focus on the effects of cheaper corporate bond prices for firms on their acquisition activity. Acharya et al. (2024) shows that riskier firms benefited from quantitative easing (QE), as they could issue bonds more easily. Further, lower-rated firms on the verge of being downgraded took advantage of this QE subsidy to acquire firms and delay the downgrade. While this paper studies the effect of QE on firms' acquisition behavior, our paper directly studies how a subsidy to firm-level debt prices influences acquisition behavior. Gulen et al. (2022) demonstrates that when credit conditions are more favorable, firms issue debt to complete all-cash acquisitions. While their paper focuses on macro-level conditions, our paper isolates credit conditions for individual firms and their specific acquisition activity. Both of these papers are consistent with firms taking advantage of cheap credit. We add to this literature by using a specific policy that had the direct intention of lowering corporate bond yields.[2]

The rest of the paper is as follows. The data is described in Section 2. Section 3 explains the main empirical design employed in the paper while Section 4 presents the results. The market perception analysis is described and its results presented in Section 5. Section 6 provides a discussion of all results, and Section 7 concludes.

[2]While the main purpose of the market intervention was to stabilize the corporate bond market, Fed officials also believed that it would lead to corporate investment and higher employment (of Governors of the Federal Reserve (2020)).

2 Data

We obtain firm-level characteristics from Compustat for all firms between 2017-2023. The data includes balance sheet information, such as cash holdings, debt holdings, PPE, and assets, and income statement variables, including operating income and sales, at the quarterly level. Bond issuance data comes from Mergent FISD at a daily frequency. In this dataset, we observe the offering amount, date of issuance, and maturity of each bond that corporations issue from 2017-2023. Also from Mergent FISD, we gather the individual rating of each security issued by the firm and any subsequent updating of that security's rating. For acquisition activity, we use Securities Data Company (SDC) from Refinitiv to gather data on historical M&A deals and characteristics of the deal, such as if the deal was paid for via cash or stock, the dates of announcement and completion, and the industry of the target. We gather daily stock price and return data from the Center for Research in Security Prices (CRSP). Our final dataset consists of the universe of firms that exist in both Compustat and CRSP, with merged-in Mergent FISD and SDC variables from 2017-2023. The rest of the data section elaborates more on each individual data set, explains any restrictions, and provides summary statistics.

2.1 Firm Data: Compustat and CRSP

Our base set of firms consists of Compustat firms from 2017-2023. We drop firms in the financial and regulated utilities industries by dropping those with SIC codes between 6000-6999 and 4900-4999, respectively, leaving us with 8,761 unique firms and 178,707 unique firm-quarter observations. We use the Compustat-CRSP crosswalk provided by Wharton Research Data Services in order to match CRSP data to Compustat. Sixty-eight percent of firms match to the CRSP crosswalk. For firms with more than one identifier in the CRSP data (less than 1% of all Compustat-CRSP firms), we keep the primary identifier designated by WRDS or remove the observations if one is not identified. Summary statistics of the firms can be found in Table 1.

Columns 1 and 2 describe the entire sample of firms. Size is defined as the logarithm of assets, return on assets (ROA) is operating income over assets, and market-to-book is the market value of equity over book value of equity. The variables debt-over-assets, ROA, and market-to-book are winsorized at the 1% level.

2.2 Bond Data: Mergent FISD

We use corporate bond issuance data from Mergent FISD. The sample is restricted to bonds issued in US dollars by firms that report in US dollars. Similar to the literature studying the Corporate Credit Facilities, we exclude sovereign debt and debt issued by financial and utility firms. Furthermore, we exclude convertible bonds, capital impact bonds, community bonds, PIK securities, and bonds issued in exchange for a Rule 144A bond.

Data on credit ratings of the bonds is also obtained from Mergent FISD. There are three companies that report credit ratings in this dataset: Standard & Poor's, Fitch, and Moody's. A mapping between these companies' ratings and the numeric code we use to represent them can be found in Table 5. We use ratings that are designated as an initial rating and then any subsequent updated rating of the security. If a bond issuance has either an initial or updated rating from all three companies, we take the median of the three ratings. If only two companies rated the bond, we use the minimum of the ratings as in Becker and Ivashina (2015). If there is a singular company rating the bond, we use that company's rating. Throughout the paper, HY bonds are those with credit rating less than BBB- (numeric code 13) and IG bonds are those with initial credit rating greater than or equal to BBB-.

After creating the bond sample, we merge the data with Compustat using the CRSP-Compustat and CRSP-Mergent linking tables provided by WRDS. We find 413 unique firms in the Compustat sample that issued a bond between 2017Q1-2023Q4. There are 1,267 firm-quarter observations in which the firm issued at least one bond that quarter. The sample of firms that ever

issue a bond from 2017Q1-2023Q4 are summarized in Columns 3 and 4 of Table 1. Generally, bond issuers are larger, hold less cash, and have higher debt to assets, ROA, market-to-book, and CAPEX-to-assets than non-issuers.

The COVID-19 recession led to both unprecedented monetary and fiscal policies, including the CCFs. Spurred by the announcement introducing the CCFs on March 23, 2020, firms issued a record number of bonds compared to previous years. As an illustration of this effect, Figure 2 plots histograms of the number of firms offering bonds from March 2-June 30 in 2018, 2019, and 2020. We split the histograms into IG (left) and HY (right) issuers. The distribution of IG firms issuing bonds by week in 2020 clearly stochastically dominates the same distribution in 2018 and 2019. Further, no week exceeds 15 firms issuing in 2018 or 2019 when a significant mass of weeks in 2020 have over 20 IG issuers. The change in distribution is less stark for HY issuers. On the one hand, there were five weeks with 10 or more HY issuers and two weeks with more than 15 HY issuers in 2020 with a max of 12 HY issuers in a week in previous years. However, there were no HY issuances from March 9-29, 2020. Before the second announcement regarding the CCFs on April 9, HY issuers per week was around the 10th percentile of issuers per week for all 2019 weeks.

2.3 M&A Data: SDC

Data on acquisition activity is obtained from SDC (Refinitiv). We screen for acquisitions announced by firms with headquarters in the U.S. and pull all acquisitions announced from January 2017 - December 2023. We create indicators for the quarter of an announcement of an acquisition deal and merge these into our combined Compustat-Mergent FISD dataset. SDC contains data on both private and public firms while Compustat/CRSP only contains data on public firms, so our final merged sample only consists of acquisition deals announced by public firms in Compustat and listed on the main stock exchanges covered by CRSP. We find 2,085

unique firms that ever announced an acquisition and 5,732 firm-quarter observations in which a firm announced at least one acquisition.

Columns 5 and 6 of Table 1 describe the sample of firms that announce at least one acquisition from 2017Q1-2023Q4. These firms appear very similar to the whole sample in terms of the six variables the table focuses on. When we look at firms that both issue bonds and acquire, as summarized in Columns 7 and 8, we see that these firms resemble those that issue bonds more than the general population. They are larger, have higher debt-to-assets, hold less cash, and have higher CAPEX and ROA. Interestingly, they have the lowest market-to-book values.

One limitation of the SDC data is that not every acquisition observation provides information on the payment method for the acquisition. Of our 6,130 acquisitions we observe by our firms from 2017Q1 to 2022Q4, 46.8% have non-missing observations for the variables describing the payment of the deal. Therefore, while we may know an acquisition occurred, we do not always know that it was a cash acquisition. Figure 3 contains bar graphs illustrating the breakdown of these acquisitions into cash, non-cash, and deals for which we have no payment information. A cash deal is defined as one in which more than 50% of the value of the deal was paid in cash. As in Figure 1, we can see an increase in cash and non-cash deals after 2020.

Given our focus on the impact of increased access to corporate bond market financing in this paper, we want to focus on acquisitions paid for with cash and not other methods. To circumvent this data limitation, we use other characteristics of the deals to predict whether the acquisition was a cash deal or not via the mi impute package in Stata. These characteristics include whether the target of the acquisition is a public firm and the status of the acquisition. For example, 395 of our acquisitions involve publicly listed targets, and 305 of those observations have information on the deal type, making the target status a useful variable to impute the cash deal status.

Once we identify the true and imputed cash deals, we collapse the cash deal indicator to an acquirer-quarter basis by taking the maximum of the cash deal indicator for all acquisitions by the firm in that quarter. We utilize the mi estimate package in Stata to estimate this specification

using 20 different imputations per observation with appropriate standard errors.

3 Empirical Design

We hypothesize that the creation of facilities to purchase corporate bonds from firms with IG ratings led to an increase in cash acquisitions financed through the new bond issuances. This hypothesis relies on the assumption that firms with IG ratings were more likely to issue bonds after the announcement of the CCFs than non-IG rated firms. The creation of the CCFs was the first time that the Fed promised to purchase corporate bonds, and therefore, it was unknown to firms not only that the CCFs would be announced, but also that only the bonds of the firms with IG ratings at the time of purchase would be eligible for purchase. On April 9, 2020, it was announced that firms with an IG rating as of March 22, 2020 would be eligible as well, even if they had fallen below the IG rating between March 23 and April 9. When the program was announced, the facilities were said to be open until December 31, 2020. It was later confirmed on November 19, 2020 that the facilities would close on December 31, 2020.

Therefore, the appropriate designation of treated firms would be those with an IG rating as of 2019Q4[3]. The treatment time period will be 2020Q1 to 2020Q4, the time in which the program was open.

$$\text{Treated}_{i,t} = \{\text{IG in 2019Q4}\}_i \times \{t \geq 2020Q1 \;\&\; t \leq 2020Q4\}_t. \tag{1}$$

To check the validity of this argument, we first regress the number of bonds issued by a firm in a given quarter on our Treated variable. The exact specification is

$$\text{Bonds Issued}_{i,t} = \beta_1 \text{Treated}_{i,t} + \gamma X_{i,t-4} + \alpha_i + \lambda_t + \epsilon_{i,t} \tag{2}$$

[3]Ratings are typically updated on a quarterly basis.

where X are controls, lagged by four quarters. These controls include the variables described in Table 1 — size, cash-to-assets, debt-to-assets, ROA, market-to-book, CAPEX-to-assets — as well as two-digit NAICs code fixed effects to control for industry effects. Standard errors are clustered at the firm level. The indicator for being rated as IG in 2019Q4 is absorbed by the firm fixed effects and the 2020 indicator is absorbed by the date fixed effects. The regression is run using observations from 2017Q1 to 2022Q4.

The results of the specification in Equation 2 can be found in Table 2. We estimate this specification first on the sample of all firms, and then separately only for firms that had a credit rating as of 2017. In both regressions, the coefficient on the variable of interest, Treated, is positive and significant, highlighting that treated firms increased their bond issuance by 0.186 to 0.206 more bonds a quarter from 2020Q1 to 2020Q4 compared to untreated firms. This number is economically meaningful as the mean number of bonds issued per quarter for a firm in the sample with a credit rating is 0.174. We can therefore use bond issuance in 2020 to test whether the announcement of the CCFs increased the acquisition activity of the treated firms.

3.1 Baseline Specification

Our baseline specification is

$$\mathbb{1}\Big\{\sum_{k=1}^{4}\text{Cash Acquisition}_{i,t+k} \geq 1\Big\} = \beta_1\text{Bonds Issued}_{i,t}+\beta_2\text{Bonds Issued}_{i,t}\times 2020_t+\gamma X_{i,t-4}+\alpha_i+\lambda_t+\epsilon_{i,t}. \tag{3}$$

Figure 4 provides a timeline to highlight relevant points and periods for the specification.

Due to the dependent variable being an imputed variable, we utilize the mi estimate package in Stata to estimate this specification using 20 different imputations per observation with appropriate standard errors.

3.2 Triple Difference-in-Differences

To further understand the mechanism driving the acquisition results, we also estimate a triple difference-in-differences specification

$$\mathbb{1}\Big\{\sum_{k=1}^{4}\text{Cash Acquisition}_{i,t+k} \geq 1\Big\} = \beta_1\text{Bonds Issued}_{i,t} + \beta_2\text{Bonds Issued}_{i,t} \times 2020_t + \beta_3\text{Treated}_{i,t}$$
$$+\beta_4\text{Bonds Issued}_{i,t} \times \text{IG in 2019Q4}_i + \beta_5\text{Treated}_{i,t} \times \text{Bonds Issued}_{i,t} + \gamma X_{i,t-4} + \alpha_i + \lambda_t + \epsilon_{i,t}. \tag{4}$$

In this specification, we test whether it was specifically the treated firms that issued in 2020 that changed their acquisition behavior. The coefficient of interest in this specification is (Treated$\times$ Bonds Issued).

For robustness to imputing the cash deal status, we also run the previous two specifications only for the sample of firms that 1) acquired public targets and 2) have available information regarding the payment of the deal. Because 305 of the 395 acquisitions involving public targets have payment details, it is more plausible that the missing payment details of the other 80 is random and not due to selection on an unobserved variable (such as target status). Therefore, we completely drop firms that have at least one acquisition without payment details available from the sample and re-estimate Equations 3 and 4.

4 Results

The results of our baseline specification estimation in can be found in Column 1 of Table 3. The coefficient of interest is that on Bonds Issued $\times$ 2020. We see that while negative in sign, this coefficient is not significantly different than zero. This coefficient is also negative but not significant in Column 3, which shows the results of estimating Equation 3 on the sample of firms that acquire public targets and have payment details. These results demonstrate that firms that issued bonds following the CCF announcements were not more likely to acquire in the year

after their bond issuance.

Columns 2 and 4 display the results of estimating the triple difference-in-differences specification in Equation 4. The coefficient of interest in these specifications is Treated×Bonds Issued. Using the imputed cash acquisition data in Column 2, this coefficient is negative but not significant once again. However, using the sample of public target acquisitions, the coefficient is now negative and significant. These results suggest that the IG firms who issued after the CCF announcements were actually less likely to acquire public targets with cash in the year after issuance than non-IG rated firms who also issued.

In Column 4, the coefficient on Bond Issued × 2020 is positive and significant. Therefore, having issued a bond in 2020 did increase the likelihood of a firm acquiring a public target in the next year, but not for treated firms. In fact, the combination of the two coefficients is equal to -1.130 and is significant at the 10%, proving that the IG-rated firms were less likely to announce an acquisition of a public target after a 2020 bond issuance than they were after other bond issuances.

5 Market Perception of Acquisitions

In addition to determining the effect on acquisition activity, we also investigate the market perception of the acquisitions that do occur. To do so, we focus on the 5-day cumulative abnormal stock market returns (CARs) on the day of the announcement of the cash acquisition. Analyzing the market perception of the acquisitions can tell us if acquisitions by treated firms were more likely to be value-increasing or value-decreasing acquisitions.

Harford and Uysal (2014) provides two theories of how access to the corporte bond market affects acquisition likelihood.

Theory 5.1 ***Financial Constraints Theory:*** *Credit market access relaxes a firm's financial constraints, and they pursue more positive NPV projects.*

Theory 5.2 ***Free Cash Flow Theory:*** *Credit market access provides firms with more disperse investors and leads to less effective monitoring. Firms will pursue more negative NPV projects.*

Positive CARs around the announcement of an acquisition suggests the relationship between credit market access and acquisition is driven by the financial constraints theory while negative CARs implies the free cash flow theory. Harford and Uysal (2014) finds that firms with credit market access have lower CARs surrounding their acquisition announcements than other firms, and thus credit market access leads to a dispersion of investors and weaker monitoring.

In this paper, we analyze how the Federal Reserve's promise to purchase corporate bonds impacted acquisition activity. While our results indicate that treated firms that issued bonds were less or equally as likely to engage in acquisitions, comparing the CARs of these acquisition announcements to control acquisitions can provide us with more insight into why.

It is possible that the acquisitions are more likely to be value-increasing because the CCFs relaxed financial constraints of the firms in a time of large macroeconomic uncertainty and allowed them to pursue positive NPV projects they would not have if not for the effect of the CCFs. However, the acquisitions could be value decreasing if the announcement of the CCFs instigated firms to issue bonds due to lower relative cost, but then CEOs felt pressure to funnel these funds into projects, such as acquisitions, that could have higher returns than saving the cash.

To test these hypotheses, we regress the 5-day cumulative abnormal stock market returns on a treatment variable. This specification is run at the acquisition level a because firms can announce more than one acquisition in a quarter. To reduce the number of regressors, we create an indicator for the firm issuing a bond in the year prior to the acquisition

$$\text{Issued}_{i,t} = ((\sum_{k=1}^{4} \text{Bonds Issued}_{i,t-k}) \geq 0). \tag{5}$$

In line with our baseline specification, the coefficient of interest would then be if this issuance occurred from 2020Q1-2020Q4, or that the current period is between 2020Q2-2021Q4

$$(\text{Issued} \times 2020)_{i,t} = (\text{Issued}_{i,t} == 1 \ \& \ t \geq 2020Q2 \ \& \ t \leq 2021Q4)). \tag{6}$$

In the specification, we lag the firm controls by a year to capture the one-year look ahead effect on acquisitions in the baseline specification. Our ideal specification would then be

$$\text{CARs}_{a,i,t} = \beta_1 \text{Issued}_{i,t} + \beta_2 (\text{Issued} \times 2020)_{i,t} + \gamma X_{i,t-4} + \alpha_i + \lambda_t + \epsilon_{a,i,t}. \tag{7}$$

Due to technical limitations in using an imputed variable to determine inclusion in a regression, we cannot include the firm, industry, and date fixed effects previously included in other regressions. In the closest approximation, we include an indicator for the 2020 time period as

$$2020_t = (t \geq 2020Q2 \ \& \ t \leq 2021Q4) \tag{8}$$

to capture acquisitions occurring up to a year after the treatment period. Our baseline specification for the market perception analysis is then

$$\text{CARs}_{a,i,t} = \beta_1 \text{Issued}_{i,t} + \beta_2 (\text{Issued} \times 2020)_{i,t} + \beta_3 2020_t + \gamma X_{i,t-4} + \epsilon_{a,i,t}. \tag{9}$$

Results of this estimation can be found in Column 1 of Table 4. The main coefficient of interest, (Issued×2020), is insignificant at the 10% level, implying that cash acquisitions following a 2020 bond issuance were not perceived differently than cash acquisitions following bond issuances in other periods.

We also adjust our triple difference-in-differences specification to study the market perception of cash acquisitions following bond issuance. As we still cannot include firm and date fixed effects, we must add in the specific indicators for 2020 and IG in 2019Q4, leaving us with a final specification of

$$\begin{aligned}\text{CARs}_{a,i,t} = \beta_1 \text{Issued}_{i,t} + \beta_2(\text{Issued} \times 2020)_{i,t} + \beta_3 2020_t + \beta_4(\text{IG in 2019Q4})_i \\ + \beta_5 \text{Treated}_{i,t} + \beta_6(\text{Issued} \times \text{IG in 2019Q4})_{i,t} + \beta_7(\text{Treated} \times \text{Issued})_{i,t} + \gamma X_{i,t-4} + \epsilon_{a,i,t}.\end{aligned} \tag{10}$$

The results of this specification can be found in Column 2 of Table 4. While the coefficient of interest, (Treated × Issued), is insignificant at the 10% level, it is now positive, suggesting a more favorable market perception of acquisitions by treated firms that issued than firms that issued in general.

In an effort to include our fixed effects, we estimate Equation 7 on the sample of all acquisitions, regardless of the method of payment. We augment Equation 7 to include interaction terms with each of the main regressors with an indicator for the acquisition being a cash deal based on our imputations. The specification is

$$\begin{aligned}\text{CARs}_{a,i,t} = \beta_1 \text{Issued}_{i,t} + \beta_2(\text{Issued} \times 2020)_{i,t} + \beta_3 \text{Cash Deal}_{a,i,t} \\ + \beta_4(\text{Cash Deal} \times \text{Issued})_{a,i,t} + \beta_5(\text{Cash Deal} \times \text{Issued} \times 2020)_{a,i,t} + \gamma X_{i,t-4} + \alpha_i + \lambda_t + \epsilon_{a,i,t}.\end{aligned} \tag{11}$$

The estimation results of this specification can be found in Column 3 of Table 4. The coefficient for (Issued × 2020), which now applies to all acquisitions, is once again insignificant. The coefficient on (Cash Deal × Issued × 2020) is also insigificant, but the opposite sign.

We extend the triple difference-in-differences specification in Equation 10 to include indicators for a cash deal and estimate it with all acquisitions. We can see the results in Column 4. Our coefficient of interest is (Cash Deal × Treated × Issued), which is insignificant at the 10% level.

Finally, we estimate the specification in Equation 7 and the triple difference-in-differences specification using only the sample of acquisitions that we have payment details for and are designated as cash deals. These results are in Columns 5 and 6 of Table 4, respectfully. While the coefficient of interest in Column 5 is still insignificant, we find a positive and significant coefficient on (Treated × Issued) in Column 6. The results of these regressions taken together suggest that the acquisitions announced by the treated firms who issued bonds were perceived

more favorably than those by non-treated firms who issued. Finally, we test the combination of the two coefficients, (Issued × 2020) and (Treated × Issued), and find no significant difference. Therefore, while acquisitions following issuances in 2020 by treated firms were perceived more favorably than those by non-treated firms, the market perception of acquisitions following issuances in 2020 by treated firms were not perceived differently than acquisitions following other issuances by the same set of firms.

6 Discussion

The results presented in the previous two sections prove that there was significant heterogeneity in the impact of the CCFs announcement on the relationship between bond issuance and acquisition activity. In general, firms that issued bonds in 2020 may have been more likely to announce acquisitions in the year following, but this trend was not driven by those that were IG-rated before the announcement. In fact, those firms may have been less likely to acquire following a bond issuance in 2020.

While the treated firms that issued bonds may have been less likely to acquire, our analysis of their 5-day cumulative abnormal returns at the acquisition announcement date indicate that these acquisitions were perceived more favorably by the market than those by other firms announcing acquisitions. Combined with our results about the likelihood of acquisitions, this suggests that our treated firms may have been more selective about the acquisitions it pursued following the CCFs than non-treated firms, decreasing the likelihood of acquisitions compared to non-treated firms. Perhaps non-treated firms were taking advantage of the issuance wave to fund less profitable acquisitions while the treated firms may have felt they were under more scrutiny due to the possibility of the Fed purchasing their bonds. Additional analysis is needed to confirm these hypotheses.

7 Conclusion

We study whether the Federal Reserve's Primary and Secondary Market Corporate Credit Facilities led to increased acquisition activity by firms issuing eligible bonds. Based on theories proven by Harford and Uysal (2014), credit market access could lead to greater acquisition activity by either relaxing financial constraints to allow firms to pursue more positive NPV projects or by firms undergoing more value-decreasing projects due to less effective monitoring from dispersed bondholders. We focus on the CCFs as a program that impacted effective credit market access for firms with investment-grade credit ratings and study the effect on their acquisition activity.

Using a triple difference-in-differences specification, we find suggestive evidence that treated firms were less likely to announce acquisitions following bond issuance spurred by the CCFs than non-treated firms who issued in the same periods. This finding is at odds with our initial hypothesis that the CCFs expanded effective credit market access for treated firms and therefore allowed them to pursue more positive NPV acquisitions. However, looking at the 5-day cumulative abnormal returns of the firms around the announcement of these acquisitions, we find that the acquisitions by treated firms were perceived more positively than those by non-treated firms following a bond issuance. This suggests that the treated firms were more selective in pursuing acquisitions after bond issuance than the non-treated firms, which we believe is due to increased investor scrutiny spurred by the possibility of the Fed purchasing its bonds.

8 References

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Acharya, Viral, Ryan Banerjee, Matteo Crosignani, Tim Eisert, and Renee Spigt. 2024. Exorbitant privilege? quantitative easing and the bond market subsidy of prospective fallen angels.

Becker, Bo, and Victoria Ivashina. 2015. Reaching for yield in the bond market. *Journal of Finance* 70(5):1863–1902.

Darmouni, Olivier, and Kerry Siani. 2023. Bond market stimulus: Firm-level evidence.

of Governors of the Federal Reserve, Board. 2020. Semiannual report of monetary policy.

Flanagan, Thomas, and Amiyatosh Purnanandam. 2020. Corporate bond purchases after covid-19: Who did the fed buy and how did the markets respond?

Gulen, Huseyin, Candace Jens, and Stefano Rossi. 2022. Credit market driven acquisitions.

Harford, Jarrad. 2004. What drives merger waves? *Journal of Financial Economics* (77).

Harford, Jarrad, and Vahap Uysal. 2014. Bond market access and investment. *Journal of Financial Economics* (112):147–163.

Malmendier, Ulrike, Marcus Opp, and Farzad Saidi. 2016. Target revaluation after failed takeover attempts: Cash versus stock. *Journal of Financial Economics* (119):92–106.

Rempel, Mark. 2020. Stockpiling liquidity to acquire innovation.

9 Figures

Figure 1: Time Series of Bond Issuance and Acquisition Announcements

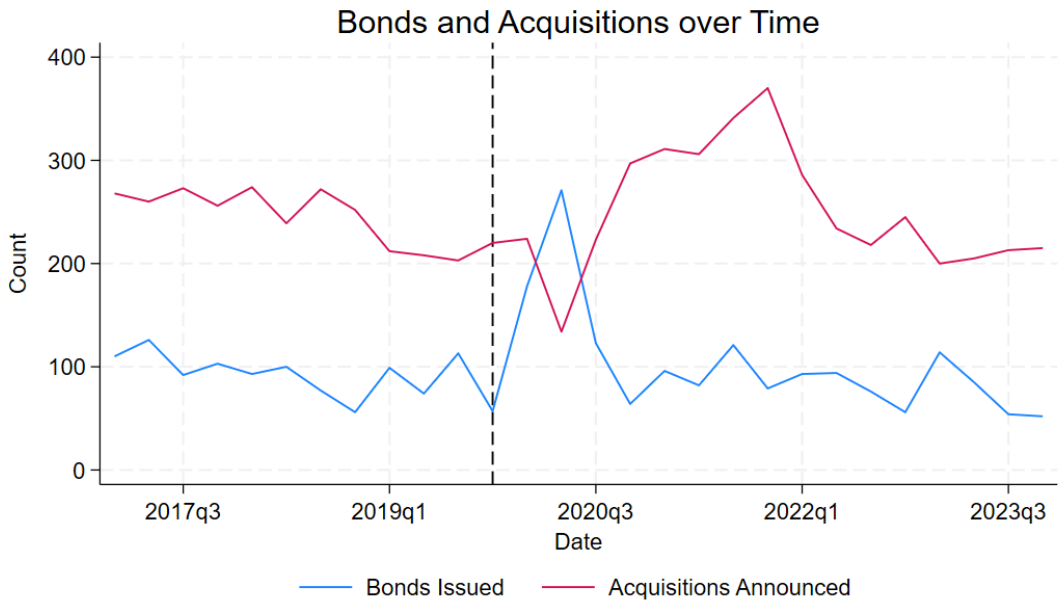


Figure 2: Histograms of Number of Firms Offering Bonds between March 2 - June 30

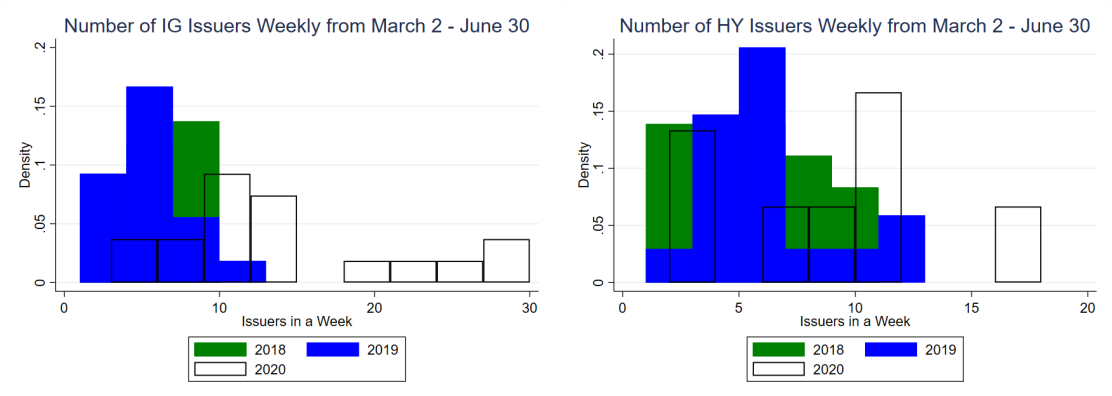


Figure 3: Time Series of Payment Detail for Acquisitions

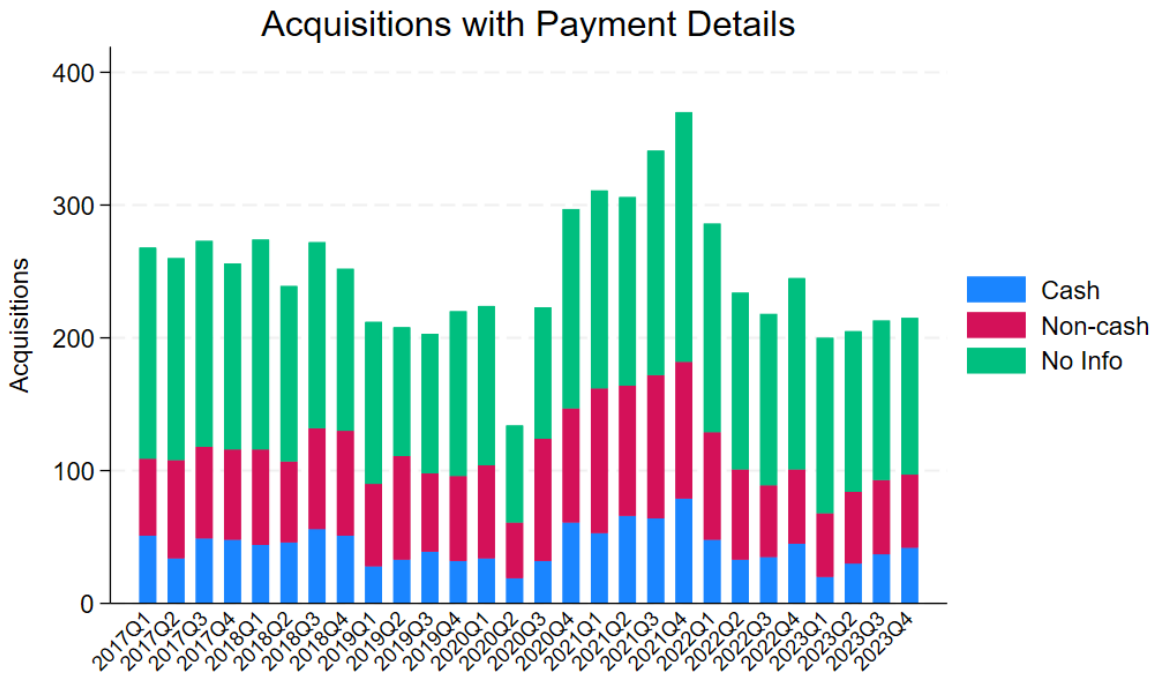
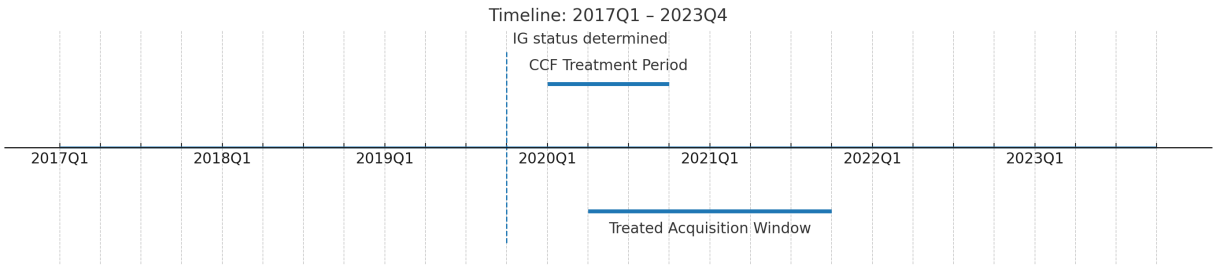


Figure 4: Timeline of Treatment Periods and Designation Points



10 Tables

Table 1: Summary Statistics of Sample Firms

	All Firms		Bond Issuers		Acquirers		Issuers & Acquirers	
	Median	SD	Median	SD	Median	SD	Median	SD
Size	6.587	(2.249)	8.782	(1.294)	6.403	(2.133)	8.412	(1.445)
$\frac{\text{Cash}}{\text{Assets}}$	0.116	(0.241)	0.078	(0.114)	0.108	(0.235)	0.055	(0.070)
$\frac{\text{Debt}}{\text{Assets}}$	0.228	(0.244)	0.336	(0.203)	0.237	(0.249)	0.416	(0.178)
ROA	0.018	(0.090)	0.028	(0.035)	0.017	(0.095)	0.028	(0.028)
Mkt-to-Book	2.473	(8.227)	2.957	(8.238)	2.444	(8.346)	2.367	(4.962)
$\frac{\text{CAPEX}}{\text{Assets}}$	0.011	(0.042)	0.016	(0.034)	0.011	(0.045)	0.013	(0.028)
N	95372		3393		14920		465	

Table 2: Announcement of the CCFs and Issuance Activity

Bonds Issued	(1)	(2)
$\text{Treated}_{i,t}$	0.186***	0.206***
	(0.032)	(0.036)
$\text{Size}_{i,t-4}$	-0.002	-0.072
	(0.003)	(0.046)
$\frac{\text{Cash}}{\text{Assets}}_{i,t-4}$	-0.011**	-0.134
	(0.005)	(0.141)
$\frac{\text{Debt}}{\text{Assets}}_{i,t-4}$	-0.023***	-0.300***
	(0.007)	(0.089)
$\text{ROA}_{i,t-4}$	0.019	0.179
	(0.014)	(0.227)
$\text{Mkt-to-Book}_{i,t-4}$	-0.000	-0.001
	(0.000)	(0.001)
$\frac{\text{CAPEX}}{\text{Assets}}_{i,t-4}$	0.071**	0.781***
	(0.028)	(0.295)
Constant	0.045**	0.926**
	(0.019)	(0.436)
N	70,400	10,889
Adj R^2	0.120	0.11
Within R^2	0.005	0.005

Table 3: Announcement of the CCFs and Cash Acquisition Activity

Cash Acquisitions Announced	(1)	(2)	(3)	(4)
$\text{Bonds Issued}_{i,t}$	-0.148**	-0.088	-0.114	-0.912
	(0.072)	(0.327)	(0.082)	(0.724)
$(\text{Bonds Issued} \times 2020)_{i,t}$	-0.088	0.625	-0.341	1.790***
	(0.191)	(0.934)	(0.241)	(0.686)
$\text{Treated}_{i,t}$		0.153		-0.057
		(0.298)		(0.461)
$(\text{Bonds Issued} \times \text{IG 2019})_{i,t}$		-0.059		0.813
		(0.336)		(0.730)
$(\text{Treated} \times \text{Bonds Issued})_{i,t}$		-0.770		-2.155***
		(0.954)		(0.750)
$\text{Size}_{i,t-1}$	-0.275	-0.272	-0.381	-0.384
	(0.222)	(0.221)	(0.365)	(0.363)
$\frac{\text{Cash}}{\text{Assets}}_{i,t-1}$	0.834	0.819	0.434	0.464
	(1.008)	(1.006)	(1.263)	(1.276)
$\frac{\text{Debt}}{\text{Assets}}_{i,t-1}$	-1.227*	-1.220*	-0.151	-0.139
	(0.670)	(0.672)	(1.022)	(1.024)
$\text{ROA}_{i,t-1}$	-1.280	-1.294	0.130	0.129
	(2.146)	(2.157)	(3.300)	(3.304)
$\text{Mkt-to-Book}_{i,t-1}$	0.009	0.009	-0.009	-0.009
	(0.009)	(0.009)	(0.014)	(0.014)
$\frac{\text{CAPEX}}{\text{Assets}}_{i,t-1}$	-0.708	-0.616	-10.600**	-10.45**
	(2.482)	(2.488)	(4.617)	(4.713)
N	5,587	5,587	2,394	2,394
Prob $> F/\chi^2$	0.000	0.000	0.013	0.020

Table 4: Cumulative Abnormal Returns on Cash Acquisitions

5-Day CARs	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Issued}_{i,t}$	0.011	0.025	0.000	-0.006	-0.012	0.026
	(0.012)	(0.031)	(0.008)	(0.018)	(0.016)	(0.042)
$(\text{Issued} \times 2020)_{i,t}$	-0.009	-0.086	-0.026	-0.023	-0.033	-0.282***
	(0.027)	(0.077)	(0.017)	(0.044)	(0.029)	(0.049)
2020_t	0.005	0.007				
	(0.011)	(0.012)				
IG in 2019Q4_i		0.008				
		(0.012)				
$\text{Treated}_{i,t}$		-0.011		-0.021		0.004
		(0.029)		(0.023)		(0.025)
$(\text{Issued} \times \text{IG 2019})_{i,t}$		-0.021		0.004		-0.035
		(0.034)		(0.020)		(0.047)
$(\text{Treated} \times \text{Issued})_{i,t}$		0.095		0.015		0.262***
		(0.086)		(0.050)		(0.086)
$\text{Cash Deal}_{a,i,t}$			0.005	0.005		
			(0.005)	(0.005)		
$(\text{Cash Deal} \times \text{Issued})_{a,i,t}$			-0.005	0.000		
			(0.012)	(0.033)		
$(\text{Cash Deal} \times \text{Issued} \times 2020)_{a,i,t}$			0.032	0.038		
			(0.031)	(0.079)		
$(\text{Cash Deal} \times \text{Treated})_{a,i,t}$				-0.021		
				(0.023)		
$(\text{Cash Deal} \times \text{Issued} \times \text{IG 2019})_{a,i,t}$				-0.006		
				(0.034)		
$(\text{Cash Deal} \times \text{Treated} \times \text{Issued})_{a,i,t}$				0.014		
				(0.095)		
$\text{Size}_{i,t-4}$	-0.008***	-0.008***	-0.016*	-0.016*	0.005	0.006
	(0.002)	(0.002)	(0.008)	(0.008)	(0.031)	(0.031)
$\frac{\text{Cash}}{\text{Assets}}_{i,t-4}$	-0.013	-0.013	-0.001	-0.003	-0.310	-0.308
	(0.038)	(0.038)	(0.037)	(0.037)	(0.188)	(0.189)
$\frac{\text{Debt}}{\text{Assets}}_{i,t-4}$	0.043**	0.043**	-0.011	-0.012	0.034	0.034
	(0.020)	(0.020)	(0.029)	(0.029)	(0.097)	(0.098)
$\text{ROA}_{i,t-4}$	-0.170	-0.165	-0.024	-0.020	0.494	0.533
	(0.193)	(0.193)	(0.090)	(0.091)	(0.527)	(0.526)
$\text{Mkt-to-Book}_{i,t-4}$	-0.001**	-0.001**	-0.000	-0.000	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
$\frac{\text{CAPEX}}{\text{Assets}}_{i,t-4}$	-0.089	-0.087	-0.017	-0.015	0.106	0.110
	(0.097)	(0.097)	(0.086)	(0.087)	(0.190)	(0.197)
Constant	0.075***	0.079***	0.144**	0.143**	-0.012	-0.024
	(0.020)	(0.022)	(0.066)	(0.067)	(0.286)	(0.286)
N	1,267	1,267	3,841	3,841	441	441
Prob > F	0.002	0.003	0.507	0.616	0.571	0.000

A Overview of the CCFs

In the early onset of the COVID crisis in 2020, foreign investors and money market funds cashed in their US Treasuries. This led to substantial increases in the balance sheets and supplementary leverage ratios of US Treasury Primary Dealers. On March 9, repo rates on 10 Year US Treasuries rose considerably, causing the usual risk-free basis trades held by many large hedge funds to become unprofitable. From March 9-15, hedge funds unwound their basis trades simultaneously, leading to illiquidity in the US Treasury market. The US corporate bond market soon followed suit.

On March 15, the Federal Reserve bought $700 billion worth of Treasury notes, alleviating the selling pressure felt by hedge funds. On March 23, the Federal Reserve bought more US Treasuries and announced the CCFs. The PMCCF was intended to allow corporations to issue bonds directly to the Federal Reserve and the SMCCF to buy existing corporate bonds on the secondary market. The purchase of US Treasuries and the announcement alone was enough to stabilize markets on March 23 (Darmouni and Siani (2023)), although corporate bond purchases did not start until June 16th. The bond market surged and firms issued bonds at a record-breaking number. To fund the purchases, the Treasury Department invested $25 billion into a new Federal Reserve subsidiary that could buy up to $250 billion in corporate debt from bondholders in the secondary market. The Federal Reserve extended the program until December 31, 2020 and on June 2, 2021 announced plans to wind down its corporate debt portfolio. [4]

The qualification rules for purchase via the CCFs changed from the first announcement on March 23, 2020. To qualify for the purchase when the programs were initially announced, bonds had to be less than 4 years in maturity, rated as investment grade as of March 22, 2020, and from a domestic firm or an international firm that had a significant amount of U.S. employees. However, on April 9th, 2020, the Fed announced it would also purchase bonds from "fallen angel" corporations — firms that were rated as investment grade before the Fed's an-

[4]Federal Reserve Press Release

nouncement but had since been downgraded. The selection process for which bonds would be purchased was not transparent. For example, some have questioned why the Federal Reserve bought bonds from large firms, such as Apple[5]. Between June and July 2020, the Fed bought 414 out of 1818 potential bonds and as of September 7th, 2020 only $12.5B was used out of the $750B allocated towards the PMCCF and SMCCF. Flanagan and Purnanandam (2020) document bonds that had smaller credit spreads and longer maturity were more likely to be bought by the Federal Reserve.

B Credit Rating Mapping

Table 5: Credit Rating Mapping

S&P	Moody	Fitch	Numerical
AAA	Aaa	AAA	22
AA+	Aa1	AA+	21
AA	Aa2	AA	20
AA-	Aa3	AA-	19
A+	A1	A+	18
A	A2	A	17
A-	A3	A-	16
BBB+	Baa1	BBB+	15
BBB	Baa2	BBB	14
BBB-	Baa3	BBB-	13
BB+	Ba1	BB+	12
BB	Ba2	BB	11
BB-	Ba3	BB-	10
B+	B1	B+	9
B	B2	B	8
B-	B3	B-	7
CCC+	Caa1	CCC+	6
CCC	Caa2	CCC	5
CCC-	Caa3	CCC-	4
CC	Ca	CC	3
C	C	C	2
D	D	D	1

[5]CNBC Article