

Bond Data Analysis

[PRELIMINARY]

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I. Bond Data

I obtain the records of U.S. Corporate bond transactions from the enhanced Trade Reporting and Compliance Engine (TRACE). This database is maintained by the Financial Industry Regulatory Authority (FINRA) and contains information on all OTC secondary market trades in eligible corporate bonds. To classify the trades according to their underlying securities' characteristics, I merge the TRACE records with the Mergent Fixed Income Securities Database (FISD), a comprehensive database of publicly offered U.S. bonds that includes information on debt covenants. Next, I compare the profile of electronic trades taking place in Alternative Trading Systems (ATS) with trades executed through the regular voice OTC systems.

A. *Transaction Data*

The TRACE database records detailed information on every transaction of eligible securities, including a trade's date, time, (untruncated) principal, bond identifier (CUSIP), the reporting side's capacity (either principal or agent), the type of the reporting side's counterparty (dealer or customer), whether the trade took place in an ATS, among others. The use of this data, however, requires the application of filters to correct for reporting errors that can bias the estimations of standard measures of market-liquidity.

Following [Dick-Nielsen \(2013\)](#), I apply a number of filters to remove errors and eliminate the double counting of trades. Specifically, I remove transaction records where the bond identifier (CUSIP) is missing, records of trades that were cancelled in the first **X** days (trade *cancellations*) or at a later time (trade *reversals*), as well as their original reports. I also adjust the sample to account for the correction of earlier transaction reports (trade *corrections*). Since FINRA members are required to file a report for every transaction, trades between dealers (*inter-dealer* trades) are recorded twice. To avoid double-counting, which would distort measures of market volume, bond turnover, trade price impact, etc., I delete the buyer-side reports. Finally, I also remove reports of trades executed on an when-issued basis, trades executed under special conditions, trades where the reported price is a weighted-average price, locked-in trades (that is, trades in which a reporting firm reports on behalf

of both actual trading counterparties), trades of non-corporate securities, and the reports of trades which were settled more than 6 days after their execution date.

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Alternative Trading Systems are electronic platforms that take part in every transaction executed through their systems, and thus have a reporting obligation. Starting in July 2016, the TRACE enhanced dataset has included an indicator to mark trades executed in ATS platforms. I use this variable as a flag for electronic trades. It must be noted, however, that this approach leaves out trades executed in platforms that are not registered as ATS.¹ Moreover, as documented by [Kozora, Mizrach, Peppe, Shachar, and Sokobin \(2020\)](#), the industry has adopted a few electronic trading protocols, and many platforms can offer more than one. However, the available data does not distinguish among them.

The two most common types of protocols are the request-for-quote (RFQ) and the electronic limit order books protocols. The latter is similar to the electronic communication network (ECN) protocols used in the U.S. equity and Treasury markets, where automated matching systems which provide immediately executable liquidity. The RFQ protocols, on the other hand, hold similarities with the traditional voice OTC trading, where quotes submitted in response to a request are meant for the soliciting party only, and expire at the end of the session. Given the limitations of the data, in what follows I treat all ATS trades as electronic trades, regardless of their protocol, and all non-ATS trades as voice OTC transactions.

B. Bond Characteristics

I investigate the characteristics of the corporate bonds traded in the competing secondary venues using the Mergent Fixed Income Securities Database (FISD). This dataset contains detailed information on public-offered U.S. bonds, such as age, maturity, amount outstanding, credit rating, issuance amount, coupon information, and so on. Of particular interest to this analysis, the Mergent FISD data documents the presence of any call, put or convertibility features, as well as of covenants designed to protect bondholders.

From an FISD sample containing all the bonds issued up until the second quarter of 2020, I exclude non-perpetual bonds with a missing maturity date, as well as non-corporate bonds, and bonds denominated in foreign currency. This filtering preserves nearly 139 thousand Dollar-denominated US corporate bonds. Unfortunately, the vast majority of those (a little over 75%) are Medium Term Notes (MTNs), for which the FISD does not record covenant information.² After excluding MTNs and other bonds missing both covenant and subsequent data information, I am left with 27,962 unique bonds. I then merge the cleaned TRACE files with the Mergent FISD data by matching entries on the bonds' CUSIPs.

Bonds offer a variety of covenants designed to reduce the cost of debt by guaranteeing investors some protection from potential losses. These contractual clauses work either by restricting the actions of the issuer and its subsidiaries (*debt restrictive* covenants) or by triggering certain provisions upon the occurrence of a specific contingency (*bondholder pro-*

¹Non-ATS platforms need only report a trade if they are a party to the transaction, such as when acting as a riskless counterparty to both sides of a trade involving anonymous buyer and seller.

²MTNs are Rule 415 shelf-registered securities. See [Billett, King, and Mauer \(2007\)](#).

protective covenants. In addition, bonds can have convertibility features **FINISH. talk about credit rating variable**

But the addition of covenants or convertibility features

I am interested in how bonds traded in electronic platforms differ from their counterparts in the more traditional voice OTC markets. in terms of the types and number of covenants offered.

evidence of what? more complex securities may be harder to price, therefore rendering them less liquid -> harder to find a counterparty/ higher adverse selection costs.

C. Covenant Categories

The FISC relies on over 50 variables to codify the many different bondholder and issuer restrictive covenants. These manifold variables, however, can be grouped into broader categories, according to the types of activities they restrict. I follow Billett et al. (2007) and sort covenants into 15 categories, listed in Table I below.³ The first two categories restrict payouts to shareholders and other investors, either in the form of a dividend payment or share repurchase. Among these are covenants that prevent subsidiaries from making payments to their parent companies, and covenants that preclude issuers from redeeming subordinate debt.

The next seven categories relate to restrictions on the financing activities of the parent company or its subsidiaries. These include covenants precluding the issuance of additional debt with maturity of 1 year or longer (*funded*, or *long-term*, debt), or debt of varying seniority (*subordinate*, *senior* and *secured* debt). Covenants that place accounting-based restrictions on an issuer's or its subsidiaries' leverage are grouped into the "total leverage tests" category. Such covenants may impose a minimum net worth level, a minimum ratio of earnings or a specified fixed-charge coverage ratio, or even limitations on the total-indebtedness of the issuer. The following category consists of covenants that preclude an issuer or its subsidiaries from selling and then leasing back assets that serve as collateral, requiring instead that outstanding debt be retired or that the net proceeds from the sale be used to acquire equivalent assets. Another way covenants can affect a firm's funding decisions is by prohibiting the issuance of additional common or preferred stocks. The last three categories pertaining to financing activities consist of event-driven covenants. In the first group are covenants that trigger certain provisions when either the issuer's rating or its net worth fall below pre-specified levels. Next, cross-default provisions stipulate that default (or acceleration of payments in default) be triggered in the issue when default (or acceleration of payments in default) occurs for any other debt issue. Lastly, a poison put allows debt to be redeemed before its maturity in case of a change in control of the issuer, and is usually deployed by companies as a takeover defense mechanism.

The final three categories gather covenants that affect the investment activities of the issuer or its subsidiaries. These can take the form of a requirement that the net proceeds from the sale of specific assets be used to redeem outstanding debt, or a proscription of certain risky investments. They can also cover the legal obligations in the case of a merger

³A list of all the FISC variables used in to form each group, as well as their FISC table of origin, can be found on <https://github.com/abcarvalho/bond-data/wiki/Covenant-Categories>.

by specifying the contractual clauses of existing debt that must be honored by the surviving entity.

If indeed electronic trading favors simpler, more standardized securities, we can expect trades in ATS to consist primarily of covenant-free bonds and debt with a fewer number of covenants relative to bonds traded in voice OTC systems. In the next section, I analyze the profile of secondary-market trades by trading protocol (electronic v.s. voice systems), credit quality and the covenant categories described above.

D.

either by granting certain rights to creditors contingent on the occurrence of some uncertain event, or by restricting the actions of an issuer and its subsidiaries.

I obtain the data on U.S. corporate bond transactions from a

The data from U.S. corporate bond transactions used in the analysis comes from the Trade Reporting and Compliance Engine (TRACE), maintained by the Financial Industry Regulatory Authority (FINRA).

In particular, I rely on the TRACE Enhanced dataset, which contains information on all maintained by FINRA.

FINRA disseminates information on all OTC secondary market trades in TRACE-eligible corporate bonds to investors, but caps reported trade sizes for trades that exceed \$5 MIL for IG corporate bonds and \$1 MIL for high-yield corporate bonds. I rely instead on the TRACE Enhanced dataset, which contains non-capped principal amounts, as well the variables disseminated in the regular TRACE data, such as the date, time and price of a transaction, the bond CUSIP, and indicators for the dealers trading capacity (whether as principal or agent), trade direction, and whether the dealer's counterparty in a trade was another dealer or a customer. In addition,

WHY ATS trades?

Every ATS that intermediates a trade of TRACE-eligible securities is required to file reports with FINRA. But discrimination between trades executed in ATS and non-ATS in the disseminated data began only in July 2016.⁴ Therefore, I restrict the analysis to the period starting in 08/2016. Finally, because the TRACE Enhanced data is available to researchers with a 6-month lag, my sample ends in 09/2019.

Starting on July 18, 2016, FINRA reporting discriminates between trades executed in ATS and non-ATS.

FINRA began

since July 18, 2016, trades executed in an Alternative Trading System (ATS)

2015:Q2. Each transaction record contains the trade date, time, (untruncated) principal amount, CUSIP, price, an indicator of whether the trade is either between a customer and a dealer or between two dealers, trading capacity of dealers (principal or agent), trade direction, and an anonymous dealer identifier, among many other variables.

both reports generated in interdealer trades.

⁴See FINRA's Technical Notice from December 2015, available at <https://www.finra.org/filing-reporting/trace/technical-notice/trace-reporting-and-dissemination-no-remuneration-trades-and-ats>

, FINRA simply indicates their size exceed these thresholds by "5MM+" and "1MM+", respectively.

In particular, I rely on the TRACE Enhanced dataset, which does not cap obtained through the Wharton Research Data Services (WRDS.)

References

Billett, Matthew T., Tao-Hsien Dolly King, and David C. Mauer, 2007, Growth Opportunities and the Choice of Leverage, Debt Maturity, and Covenants, *The Journal of Finance* 62, 697–730.

Dick-Nielsen, Jens, 2013, How to Clean Enhanced TRACE Data, *SSRN Electronic Journal* .

Kozora, Matthew, Bruce Mizrach, Matthew Peppe, Or Shachar, and Jonathan Sokobin, 2020, Alternative Trading Systems in the Corporate Bond Market, *SSRN Electronic Journal* .

II. Tables

Table I: Covenant Categories by the Type of Restricted Activity

Covenant Restrictions	
Payouts	
1	Dividend pmnt. restrs.
2	Share repurchase restrs
Financing Activities	
3	Funded debt restrs
4	Subordinate debt restrs
5	Senior debt restrs
6	Secured debt restrs
7	Total leverage test
8	Sale & leaseback
9	Stock issue restrs.
10	Rating & net wrth. trgs.
11	Cross-default provisions
12	Poison Put
Investments	
13	Asset sale clause
14	Invest. policy restrs.
15	Merger restrictions

The table lists the 15 major categories [Billett et al. \(2007\)](#) use to group the Mergent Fixed-Income Securities Dataset (FISD) covenant variables according to the type of activity they restrict.