

Corporate bond market microstructure and transparency - the US experience

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Many countries in Asia and the Pacific Rim have rapidly developing domestic corporate bond markets. The long-run viability of these markets depends in part on whether the secondary markets facilitate efficient capital markets. The US corporate bond market has been allowed to set its own structure, but recently regulators have promoted post-trade transparency. This article presents the following lessons from the recent history of the microstructure of the US corporate bond market to help inform other regulators considering transparency:

- Regulatory intervention is sometimes necessary for markets to be transparent.
- Transparency has little effect without market incentives.
- Post-trade transparency benefits both large and small investors by lowering transaction costs.
- Transparency results in market insights, some of which are not consistent with anecdotal evidence.
- The trade reporting that accompanies post-trade transparency provides regulators such as the National Association of Securities Dealers (NASD) and the Securities and Exchange Commission (SEC) with tools to regulate more effectively.

The next section provides a discussion of the structure of the US corporate bond market, and the sections that follow explain each of the lessons above in more detail.

Structure of the US corporate bond market

Most US corporate bond trading occurs in an over-the-counter (OTC) dealer market. Broker-dealers execute the majority of customer transactions in a principal capacity, and trade among themselves in the inter-dealer market to obtain securities desired by customers or to manage their inventories.

The US corporate bond market does not have a centralised inter-dealer quotation system, and, therefore, cannot be described as either a quote-driven dealer market or an order-driven auction market. In the institutional segment, non-binding indications of interest are distributed to preferred clients, with trading conducted primarily through telephone and e-mail negotiations. Retail customer trading is also conducted mainly over the phone.² Recently,³ however, the trend in both segments has been to move towards electronic negotiation and execution.

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² See "US Securities and Exchange Commission Report to the Congress: Impact of Technology on Securities Markets", 1996.

³ See "E-Commerce in the Fixed-Income Markets: The 2005 Review of Electronic Transaction Systems" by the Bond Market Association (BMA), December 2005. The survey asked about trends in electronic trading volume, but does not separate out fixed income types or ask about the portion of trading conducted electronically.

The market has evolved into this form with little regulatory intervention. According to Biais and Green (2005), the New York Stock Exchange (NYSE) dominated the market for corporate and municipal bonds until trading migrated to the OTC market in the 1940s. Biais and Green (2005) do not attribute the migration to regulatory changes, but, rather, to the growth of institutional trading. Today, the NYSE's Automated Bond System (ABS), an electronic limit order book, lists less than 5% of US dollar-denominated corporate bonds and attracts about 1% of total trades reported. The NYSE is currently seeking to increase its market share by requesting regulatory approval that would permit broker-dealers to trade the bonds of its listed companies without those bonds being registered with the SEC.⁴

Transparency arising from regulatory intervention

By 1998, problems surfaced that the US corporate bond market could not correct through competition.⁵ Furthermore, by mid-1998, competitive forces had failed to embrace many of the technological innovations in trading that had swept other secondary markets in the United States.⁶ Given that the dealer market structure competes on relationships, it is not surprising that regulatory intervention was needed to add transparency to the US corporate bond market.⁷ In fact, transparency improvements in dealer markets located in the United States have often come from regulatory intervention or encouragement. For example, several transparency improvements in the Nasdaq stock market (traditionally an OTC dealer market) were the result of regulatory interventions originally opposed by dealers.⁸

In response to a request from SEC Chairman Arthur Levitt, the NASD made prices transparent in the OTC portion of the corporate bond market through the Trade Reporting and Compliance Engine (TRACE).⁹ TRACE covers the reporting and transparency of OTC trades in corporate bonds. It started operating on 1 July 2002 and was implemented in phases.

Prior to TRACE, the Fixed Income Reporting System (FIPS) provided a small degree of transparency in high-yield corporate bonds. FIPS operated from 1994 to 2002 and was the result of a regulatory intervention motivated in part by a need to better monitor the high-yield debt markets for insider trading.¹⁰ While every trade in non-convertible long-term high-yield bonds was reported to FIPS, the transparency provided by FIPS was limited to summaries of transactions and one-sided quotations in 50 bonds at a time. Unfortunately, FIPS was not "up to par".¹¹

⁴ See SEC Release 34-51999, File no SR-NYSE-2004-69, 8 July 2005.

⁵ See Arthur Levitt, "The Importance of Transparency in America's Debt Market", Remarks by SEC Chairman Arthur Levitt at the Media Studies Center, NY, NY, 9 September 1998.

⁶ See Paula Dwyer, "Never Cross a Bond Dealer", *Business Week*, 9 March 1998; and Testimony of Larry E. Fondren before the US House of Representatives Subcommittee on Finance and Hazardous Materials, Hearing on Electronic Commerce: Investing Online, 18 June 1998.

⁷ The BMA created a system to promote transparency after the NASD agreed with Chairman Levitt to promote transparency, and subsequent to a hearing on transparency by the US House of Representatives Subcommittee on Finance and Hazardous Materials in September 1998. However, the BMA's "market-driven" initiative fell short of the transparency goals outlined by Chairman Levitt in his 9 September 1998 speech.

⁸ See footnote 82 from Securities Exchange Act Release no 34-32019, SEC File no SR-NASD-92-45, 19 March 1993. Also, see Madhavan (1995) and Gong (2005) for theoretical explanations and costs of a lack of voluntary transparency in dealer markets.

⁹ See also "Debt Market Review" conducted by the Division of Market Regulation and included in the record for the US House of Representatives Subcommittee on Finance and Hazardous Materials Hearing on Improving Price Competition for Mutual Funds and Bonds, 29 September 1998; and Securities Exchange Act Release no 34-43873, File no SR-NASD-99-65, 23 January 2001.

¹⁰ See Securities Exchange Act Release no 34-32019, File no SR-NASD-92-45, 19 March 1993; the letter from US SEC Chairman Richard C Breeden to the Honourable Donald W Reigle, Jr, Chairman of the Committee on Banking, Housing and Urban Affairs of the US Senate; and "A Report by the Division of Market Regulation on Transparency in the Market for High-Yield Debt Securities", 6 September 1991.

¹¹ See Arthur Levitt, "The Importance of Transparency in America's Debt Market", remarks by SEC Chairman Arthur Levitt at the Media Studies Center, NY, NY, 9 September 1998.

When TRACE replaced FIPS, the pre-trade transparency from the quotations was eliminated and the post-trade transparency from transactions was enhanced and expanded. Since July 2002, all trades in TRACE-eligible bonds have been required to be reported to the NASD. Originally, dealers had 75 minutes to report the trade, but now have only 15 minutes. Because of industry concerns, the NASD rolled out transparency gradually. As of the most recent phase-in on 7 February 2005, 99% of the TRACE trades (95% of the par value) become transparent as soon as they are reported by dealers.¹² If the NASD proposal of 28 October 2005 is approved, all TRACE trades will be transparent immediately upon receipt of the trade report, which will mean that TRACE has been fully implemented.¹³

As mentioned earlier, TRACE provides only “post-trade” transparency, meaning that there are no “pre-trade” quotations. While the NYSE provides some “pre-trade” transparency from displayed customer limit orders, the lack of listings and activity limit the effect of this transparency. Furthermore, neither TRACE nor the NYSE explicitly reveals the identity of market participants, which means that dealers can maintain anonymity within the TRACE and NYSE transparency.¹⁴

Note that TRACE does not encompass all of the securities that might be called corporate debt. It includes straight and convertible, long- and medium-term bonds, with both high-yield and investment grade ratings. However, while trading in bonds issued under Rule 144A must be reported to the NASD, such transactions are specifically excluded from being disseminated.¹⁵ Trading in asset-backed securities and commercial paper does not need to be reported to the NASD, and, therefore, trading in these instruments is not transparent.

Note as well that increased transparency will not necessarily alter the structure of the corporate bond market, nor will it force the bond market into an equity market model. If transparency alters the market structure for US corporate bonds, it will be because transparency results in subsequent market initiatives.

Subsequent market initiatives

Even if transparency is imposed by regulators, competitive forces are still needed to achieve its full benefits. TRACE transparency, for example, can be likened to regulators flipping on a switch to make more information available. However, regulators cannot force all market participants to use the information. Instead, the ultimate dissemination of the information to dealers, institutions, retail investors and others depends on market forces. Regulators can attempt to accelerate the changes through investor education, but, ultimately, transparency will be limited if there is no demand for the information.

Theoretically, transparency promotes greater competition, which might ultimately lead to a new market structure - but only if it is more efficient than the current market structure. We have no evidence of a material change in the fundamental structure of the US corporate bond market since the introduction of TRACE over three years ago.

However, transparency is driving innovation in the marketplace, particularly in the creation of new products and services. Since the start of TRACE, the American Stock Exchange has listed two exchange-traded funds (ETFs) consisting of investment grade bonds.¹⁶ The CBOE has also proposed

¹² After-market trades in bonds rated BBB or lower and large transactions in less active high-yield bonds are transparent with a delay of up to 10 days. Furthermore, trade size is truncated for transactions of USD 1 million or more in high-yield bonds and USD 5 million or more in investment grade bonds.

¹³ See Securities Exchange Act Release no 34-52700, SEC File no SR-NASD-2005-120, 28 October 2005.

¹⁴ Most OTC trading is conducted over the phone and, therefore, not anonymous.

¹⁵ Rule 144A issues are private issues that can be traded only by Qualified Institutional Buyers (QIBs).

¹⁶ LQD (iShares GS \$ InvesTop™ Corporate Bond Fund) and AGG (iShares Lehman Aggregate Bond Fund).

listing options on corporate bonds.¹⁷ Some brokers compete on providing TRACE prices to clients and on conducting agency trades, instead of internalising, thus disclosing the full remuneration to investors.¹⁸ Finally, vendors such as Bloomberg, Bond Desk and Market Access compete to provide clients with value added analysis of TRACE data. None of these initiatives would have come about without transparency.

Evidence on the effects of the introduction of transparency

The introduction of TRACE has sparked at least three empirical studies on the effect of transparency on the corporate bond market. Edwards et al (2005) analyse whether a higher degree of transparency is associated with a reduction in transaction costs paid by investors. Bessembinder et al (2005) examine how institutional transaction costs change around TRACE initiation and whether opaque bonds are affected by the transparency of similar bonds. Finally, Goldstein et al (2005) study one phase-in of transparency in more depth than the other two studies.

All three of these studies find that transaction costs are lower for investors when bond transaction information is transparent. Furthermore, as indicated by the transaction size results of Edwards et al (2005) and the institutional results of Bessembinder et al (2005), transaction costs decline for both retail and institutional investors.¹⁹ Edwards et al (2005) compare the transaction costs of relatively transparent bonds to those of more opaque bonds. The transparent bonds have lower transaction costs than the opaque bonds for all transaction sizes. Edwards et al (2005) further confirm this result in cross-sectional regressions that control for factors other than transparency. As documented and explained by Bernhardt et al (2005), the finding is a dealer market phenomenon seen also in equity markets.

Goldstein et al (2005) suggest that the effects might not be uniform for bonds with different levels of liquidity, but none of the studies shows that transparency dried up the liquidity of any segment of the market. Moreover, because these studies control for bond characteristics, macroeconomic changes and market-wide volatility, all of which could alter transaction costs, the results are attributed to transparency.

The finding of lower transaction costs does not lead to the conclusion that social welfare improved - in part because the benefits to investors and issuers can be offset by lower dealer profits. Indeed, anecdotal claims by some market participants assert that not everyone is better off with TRACE. In particular, some dealers contend that their profits have suffered as a result of transparency.²⁰ However, at this point I am not aware of any empirical evidence supporting these claims. In fact, lower transaction costs might induce more trading, which could increase aggregate dealer profits.²¹ Therefore, more empirical evidence is needed before we can draw conclusions on net social welfare, or on the optimal level of transparency in corporate bond markets.

¹⁷ See SEC File no SR-CBOE-2003-41, 24 August 2005.

¹⁸ Internalising refers to dealers trading out of inventory. In an agency trade, customers trade with other customers. Agency trades require the disclosure of all costs, while internalising does not. See, for example, "Fidelity Investments Reduces Cost of On-line Bond Trades", a Fidelity Investments press release, 11 November 2004; and Jane J Kim, "Growing Investor Demand Spurs More Choices for Buying Bonds", *Wall Street Journal*, 24 May 2005.

¹⁹ Casey and Lannoo (2005) claim that institutional investors may have been harmed by the transparency from TRACE, but provide no evidence to support this claim.

²⁰ See, for example, "TRACE Makes Life Tough for US Junk Traders", *Investment Dealers Digest*, 7 November 2005; and the comment letter from the BMA in SEC File no SR-NASD-2005-120, 29 November 2005.

²¹ While greater transparency is attributed with spurring more investors into the equity markets, it is too soon to tell if it will have the same effect in bond markets.

Market insights from the introduction of transparency

Beyond its direct market effects, transparency gives information to academics, regulators and market participants that leads to new market insights, which, in turn, have direct implications for regulatory surveillance and policy decisions. For obvious reasons, regulators who know more and better understand their markets can regulate more wisely.

A regulator should not rely on anecdotal evidence alone if obtaining empirical data is possible and practical. The problems with anecdotal evidence can be illustrated by the famous parable of the blind men and the elephant.²² Several blind men each describe an elephant based on their own experience, but each one has a different account of what the elephant is and none of them provides a good description of the elephant. The blind men are not lying, nor are they trying to mislead others; rather, they just do not have the perspective necessary to give an adequate description.

A fragmented and opaque market (such as the US corporate bond market prior to TRACE) is likely to suffer from this problem because market participants see very little of the overall activity. A comprehensive dataset of transactions can provide regulators, academics and market participants valuable information they cannot get from anecdotal evidence alone.

The SEC and the NASD have learned a great deal from TRACE data.²³ In testimony before the US Senate Committee, Doug Shulman of the NASD declared that the “NASD now has a better view into the US corporate bond market... we have learned that the corporate bond marketplace is far more active than originally anticipated”. He further stated, “[c]ontrary to popular belief... the bond market has a substantial retail participation”.²⁴ Clearly, this information has direct implications for how the corporate bond market should be regulated.

Table 1 shows trade sizes and volumes reported to TRACE and the NYSE in 2003 and 2004. Retail-size trades between dealers and customers are quite common. In fact, while the average trade size is 788 bonds, the median is only 32. This means that a few trades are very large, but the majority of trades are small odd lots. The trades on the NYSE are almost all retail-size, supporting anecdotal evidence that the NYSE is used primarily for odd lots. Institutional-size customer transactions account for most of the par value traded, but account for fewer trade reports than retail-size trades. Inter-dealer trade reports are less than half of the trades reported.

Investor protection from transparency

If transparency comes with a central reporting system such as TRACE, regulators can use it to enhance surveillance of the secondary markets. In particular, in conjunction with other surveillance and enforcement mechanisms, regulators can automate surveillance, allowing them to more efficiently target potentially harmful behaviour. This would allow regulators to apply their resources more effectively because they can focus on firms that appear to have the highest regulatory risk. Without central trade reporting, regulators can still conduct some trade inspections, but could conduct more exams of dealers who treat investors fairly. Hence, transparency enables regulators to conduct more risk-targeted reviews - and allows dealers without indications of high regulatory risk regarding bond transactions to expend fewer resources dealing with regulatory reviews. This could provide a competitive advantage to dealers who treat customers fairly.

²² This analogy can also be found in a speech by US SEC Commissioner Roel Campos on “Developing Bond Markets in APEC: Key Lessons from the US Experience”, remarks before the ABAC/ADBI/PECC Conference, 21 June 2005.

²³ An example of pre-TRACE anecdotal evidence can be found in “The BMA to Release New Bond Market Regulatory Framework”, by Lynn Stevens Hume, *Bond Buyer*, 5 June 1998.

²⁴ Testimony of Doug Shulman, NASD, before the US Senate Committee on Banking, Housing and Urban Affairs Hearing on an Overview of the Regulation of the Bond Markets, 17 June 2004.

Table 1
**Empirical characteristics of 2003-04
 US corporate bond trading**

| | TRACE | | | NYSE | | |
|------------------------------|--------|------------|------------|--------|-----------|------------|
| | Volume | % of TRACE | % of total | Volume | % of NYSE | % of total |
| Trade reports (thousands) | | | | | | |
| All trades | 15,015 | 100.0 | 99.0 | 151 | 100.0 | 1.0 |
| Retail-size customers | 5,876 | 39.1 | 97.5 | 148 | 98.2 | 2.5 |
| Institutional-size customers | 2,890 | 19.3 | 99.9 | 3 | 1.8 | 0.1 |
| Inter-dealer | 6,248 | 41.6 | 100.0 | 0 | 0.0 | 0.0 |
| Listed bonds only | 644 | 4.3 | 81.0 | 151 | 100.0 | 19.0 |
| Par value (USD billions) | | | | | | |
| All trades | 11,833 | 100.0 | 99.97 | 3.6 | 100.0 | 0.03 |
| Retail-size customers | 145 | 1.2 | 98.0 | 3.0 | 83.3 | 2.0 |
| Institutional-size customers | 7,643 | 64.6 | >99.99 | 0.6 | 16.7 | <0.01 |
| Inter-dealer | 4,045 | 34.2 | 100.0 | 0.0 | 0.0 | 0.0 |
| Listed bonds only | 387 | 3.3 | 99.1 | 3.6 | 100.0 | 0.9 |

Note: The numbers in this table were estimated using transaction data for 2003 and 2004 from TRACE and the NYSE. We count each trade report as a separate observation. Because most inter-dealer trades are reported twice to TRACE, the inter-dealer volumes are actually slightly more than half of the values given in the table. We do not know the trade identities for NYSE trades, so we cannot accurately count the customer or inter-dealer trades. Instead, we count all NYSE trades as customer transactions. Retail-size customer trades are defined as being for 100 bonds or less. Institutional-size trades are for more than 100 bonds.

Source: Estimates using transaction data from TRACE and NYSE.

Investors can better monitor the quality of their executions with post-trade transparency, and mutual funds can better price their net asset values (NAVs). More accurate mutual fund NAVs may reduce the potential for market timing.²⁵ Investors can also more accurately compare mutual funds' past performance and risks, thus making mutual funds more attractive investments for retail investors and strengthening investor confidence in the process.

Casey and Lannoo (2005) assert that regulators should consider whether transaction surveillance is misguided, and recommend focusing instead on surveillance related to "principal protection". The main investor protection lesson from TRACE, however, is that the automation of manual surveillance can improve regulatory effectiveness - and not that trade surveillance should be a substitute for bankruptcy protection, issuer disclosure and the like.

Many types of surveillance, including insider trading, manipulation, fair price, best execution and suitability, are more efficient with a system of central trade reporting in place. Indeed, as mentioned above, FIPS was created in part to allow the NASD to include high-yield bonds in their automated insider trading surveillance.²⁶ In addition, regulators can use trade reporting systems to create

²⁵ Market timing occurs when investors trade in and out of mutual funds to take advantage of mispriced NAVs. For an example of problems that can be alleviated with transparency, see SEC press release number 2003-171, "SEC Levels Fraud Charges against Heartland Advisors, Inc., 12 Company Officials and Others for Misrepresentations, Mispricings, and Insider Trading in Two High Yield Bond Funds", 11 December 2003.

²⁶ See Securities Exchange Act Release no 34-32019, SEC File no SR-NASD-92-45, 19 March 1993.

computer programs that automatically screen trades for evidence of daisy chain, wash trade or marking manipulations.²⁷ Fair price surveillance can also be automated to identify dealers who tend to transact at prices that deviate from market prices.²⁸ Regulators can even automatically determine which firms show patterns consistent with putting investors in unsuitable investments.

Regulators who consider creating transaction reporting systems to facilitate surveillance by investors and regulators should carefully consider the following points. First, the ability to conduct meaningful surveillance can be severely hampered by poor information quality; therefore, regulators need to ensure the accurate and timely reporting of trades.²⁹ Second, to conduct the surveillance necessary to promote investor protection, transaction reporting and transparency must include customer transactions in addition to inter-dealer transactions.³⁰ Finally, when considering the costs of creating a trade reporting system, regulators should carefully examine whether automated surveillance is more cost-effective than manual surveillance.

Overall, the information from central trade reporting promotes more efficient regulatory reviews. Automated trade surveillance complements solid bankruptcy and civil laws, appropriate disclosure and governance regulations, as well as vigilant regulatory enforcement, to enhance investor confidence in the corporate bond markets and corporate bond mutual funds.

Summary

The recent increases in transparency in the US corporate bond market have provided many lessons that can aid regulators in other countries. Without dictating a specific market structure, regulators recently promoted post-trade transparency in the market, which resulted in lower transaction costs for both retail and institutional investors. In fact, Edwards et al (2005) assert that US investors would have saved over USD 1 billion in 2003 if transparency had been fully implemented sooner. Aside from the benefit to investors of lower transaction costs, the NASD has been able to create automated surveillance from the TRACE data that has streamlined the regulatory enforcement by the NASD and the SEC and should result in better investor protection.

²⁷ Daisy chain manipulations involve needless inter-dealer transactions that purposefully serve to increase the price difference between customer buy and sell transactions. Wash trades are offsetting trades conducted to effect a price change or to create volume to alter average prices. Marking occurs when participants attempt to trade at a point in time to set a price used for other purposes such as security issuance or option exercise.

²⁸ Despite investor education initiatives, many retail investors may still not be aware that they can look up bond prices. As investors become accustomed to TRACE, fair price surveillance should become less necessary because investors monitor prices themselves. Automated surveillance will then detect fewer fair pricing problems.

²⁹ Timely reporting is important to investors monitoring their trades and mutual funds estimating NAVs.

³⁰ Some systems for reporting and transparency include inter-dealer trades only. These are not as useful for investor protection surveillance as systems that include customer trades.

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