

An Overview of the Regulation of the Bond Markets

Dr. Arthur Warga
Dean, C.T. Bauer College of Business
Judge James A. Elkins Professor of Banking and Finance
University of Houston

June 17, 2004

The purpose of this report is to provide the Senate Banking committee with my perspective of the domestic corporate and municipal bond markets with regard to current issues including market structure, regulatory framework, trade reporting and price transparency. My focus will be on the potential benefits of greater price transparency, but I will also comment briefly on several of the other issues.

Overview

The bond markets have evolved into an over-the-counter system geared to institutional-sized transactions. The cost structure for both corporate and municipal securities in this market appears to be competitive for institutional-sized trades.¹ The cost of transacting retail-sized trades carried out in this dealer-market can best be described as “punishing”, and are five times the size of those found for institutional-sized trades.² In the dealer market, about 65% of corporate bond trades are retail-sized, but these trades only generate 1.8% of the dollar volume of trade in the market. This contrasts with the

¹ See Hong and Warga (2000) for evidence on cost structure in the corporate bond market. There is no formal definition of an institutional versus retail trade. For the purpose of this discussion we call any trade of less than or equal to 100 bonds (\$100,000 par value) retail, and any trade equal to or greater than 500 bonds (.5 million par) institutional. The grey area will go unnamed.

² The factor 5 refers to median bid/ask spreads. The most trustworthy evidence for this claim comes from studies of retail-sized trades in the municipal bond market. An article forthcoming in the Journal of Fixed Income by Hong and Warga (2004) and a study by the SEC (Harris and Piwowar (2004)) both reveal bid-ask spreads (cost of a round-trip transaction) for retail-sized transactions averaging well over two percent of par value. There is no published evidence on retail-sized bid-ask spreads in the dealer market, but based on my discussions with NASD and my involvement with the bond market transparency initiatives there I believe the cost structure to be similar to that found in municipal securities.

municipal market, where retail trades also comprise the majority of activity, but account for 40-50% of the dollar volume.

Trades carried out on the NYSE's Automated Bond System (ABS)³ are almost exclusively retail-sized and reveal a cost of trade similar to the institutional-sized trade costs in the dealer market⁴, although commissions can significantly increase the net cost for very small trades (say five bonds or less). It would be helpful if the NASD included a comparison of the known trading costs on ABS with the yet-to-be-revealed (as least publicly) trading costs in the dealer market in their current study of the trading environment. This comparison will also aid the SEC in determining potential benefits of removing obstacles to retail-trade activity on the ABS or like system⁵.

The Value of Transparency

To begin, I believe it is important to understand that in any market transparency is of greatest potential value when the underlying security is one that the marketplace has a structural need to trade on a frequent basis. I believe that even in a transparency-enhancing environment in which all bond transactions are reported centrally and publicly in a short period of time after they occur, there will always be large segments of the bond universe for which a lack of transparency and liquidity remains because of the fundamental characteristics of bonds.

Liquidity is the ability to transact over a short period of time without adversely affecting the price of a security. It has been suggested that liquidity can be enhanced by introducing price transparency because the market has pent up demand for trading

³ See Appendix A for a description of this market.

⁴ See Hong and Warga (2000)

⁵ According to newswire reports I have read recently, registration requirements mandated by the ABS's exchange status (and that are not imposed on the dealer market) are viewed by the NYSE as a significant hurdle to achieving levels of liquidity that would help make ABS a more viable market for retail trades.

securities and that transparency leads to greater willingness to trade. The opposite contention is also likely to be true. That is, a fundamental lack of demand to trade can create a lack of transparency that is wholly independent of the presence of a transparency-enhancing environment. Trade and liquidity in bonds declines rapidly a short period after a bond is first issued. This is because bonds are for the most part what is referred to as “buy and hold” securities.

Figure 1 provides typical values of volatility for a variety of securities. Volatility generally correlates positively with the value of adding transparency. If there is an underlying demand to trade frequently then transparency can help a market be more liquid. Volatility causes portfolio holdings to need readjustment, which in turn generates a need to trade.

There are markets where transparency has the potential to add liquidity, but the market is young and hasn’t evolved into an efficient form. Prime examples are the energy markets. While exchange-traded products currently exist for oil and gas, there are still many non-exchange traded securities for which the markets are virtually opaque or dependent on newsletter-like surveys for price discovery (e.g. Platts). At the extreme, the market for power several months to several years out into the future lacks any transparency, and yet the potential benefits of transparency are (I believe) very large. In the very least, the payoff of more credible marked-to market accounting calculations in the energy sector would seem to be worth the effort of fast-forwarding transparency in this market sector.

Within the bond markets, the greatest potential benefit of transparency is in the high yield sector. It is interesting that the NASD’s TRACE initiative remains to this day

silent in its public reporting of high yield transactions⁶, although I am aware that such reporting is inevitable. The NASD is to be commended on their TRACE initiative in that they have developed a powerful reporting tool capable of providing nearly immediate trade reports for a broad range of bonds. This initiative follows in the heels of the MSRB's price reporting initiative, and the two projects have created a sea-change in terms of the bond markets' ability to provide transparency for actual transactions. These price reporting initiatives do not provide transparency in terms of supply and demand schedules. That is, unlike a system such as ABS, they do not allow potential buyers and sellers to view actual firm offers to buy or sell a given quantity of a bond at a given price.

One of the main benefits of TRACE and the MSRB price reporting systems is that quality data will be more broadly available for market participants to employ in models that help determine estimated prices for securities that trade infrequently (the vast majority of bonds fall under this category). Net Asset Value (NAV) calculations for bond mutual funds have always been (in my mind) a very problematic exercise carried out with prices supplied by bond pricing services⁷ that are naturally handicapped by the lack of immediate access to actual transaction prices.⁸

Investment-Grade Bond Trades

Corporate and municipal bonds, especially investment grade issues, are purchased primarily as non-speculative investments. On the institutional buy-side, bonds are

⁶ I ignore the long-standing FIPS high yield trade reporting initiative that has been based on only 50 issues representing the most liquid portion of the high yield market because of the small number of bonds and representation by issues least likely to have information problems in the market.

⁷ A partial list of examples are Merrill Lynch Bond Pricing Service (for corporates), Mueller and J.J. Kenny (for municipals).

⁸ Because of liquidity effects, bond price is also properly viewed as a function of quantity purchased or sold, and it is not clear that adequate information is provided in the current TRACE system to add much value to pricing algorithms that account for quantity effects. This is more of a problem for high yield than for investment grade issues.

purchased because they satisfy certain criteria that a bond portfolio manager seeks. Their behavior is much more predictable than stocks, and so it is possible to know a lot about how they will fit into the manager's portfolio over much of their life. Portfolio managers rarely purchase investment-grade corporate bonds with the intention of selling them in the near term. As bonds age past their issuance date and are absorbed into portfolios, their liquidity rapidly disappears.⁹ The fact is most bonds do not trade on any given day (or week, or even month) because there is no reason for them to trade.

It is worth noting the historical evolution of both stock and bond markets in the United States. The New York Stock Exchange, which provides a central and immediate reporting system, originally began as a bond exchange. The simple fact is that the speculative nature of stocks and high demand for frequent trading in them naturally led to a market system vastly different from bonds. In the natural evolution of markets transparency is a consequence of the type of security being traded and investor's demand for frequent trade. If the securities being traded do not by their nature require frequent trading, then it is perfectly reasonable to find that the market for those securities has evolved into a system with less apparent transparency than, say, a stock market.

It is important to re-emphasize the point that for corporate bonds, institutional buyers account for 98% of the dollar volume of trade. These buyers are professionals, often with the staff necessary to call multiple dealers. Dealers in turn often call upon professional staffs to provide additional portfolio services demanded by buyers. Indeed, bid-ask spreads often include implicitly costs for services required by buyers (such as

⁹ This is documented, for example, by Schultz (2001). This effect is also apparent with U.S. Treasury issues. See Sarig and Warga (1989) for documentation of this effect.

solving portfolio, research, and strategy problems)¹⁰. Markets have evolved in a manner to permit dealers to bundle these portfolio services, which often require near-immediate trade execution¹¹. Electronic trade and reporting systems are not capable of providing this bundle of services that is demanded by institutional investors. This provides at least a partial explanation as to why the NYSE's Automated Bond System (ABS) has succeeded only in attracting retail-sized trades.¹²

If bid-ask spreads are restricted to institutional sized trades of at least 500 bonds (.5 million par value), bid-ask spreads¹³ for corporate bonds are in the range of 7 to 15 basis points (100 basis points equals 1 percent). The bid-ask spreads for these trades, which are in fact typical of corporate bond market activity, rival the bid-ask spreads of about 10 basis points found for the highest capitalization stocks on the New York Stock Exchange.

For investment grade bonds it is usually the case that price can be estimated within a narrow range of the correct value. The real question of interest to a buyer is what type of bond would his/her portfolio optimally require to meet its investment goal, and where would an appropriate inventory of that type of bond be found. Investment grade debt is characterized by the fact that there are often many near-perfect substitutes available. In other words, the demand by a portfolio manager is not necessarily for, say, a bond issued and backed by Citigroup, but in fact for an issue from an "A" corporate

¹⁰ Examples are creating a dedicated portfolio meant to meet pension fund obligations, or a portfolio that is immunized against adverse interest rate movements.

¹¹ The largest and most sophisticated buy-side firms carry out most of their portfolio analysis with proprietary systems built in-house, and probably would prefer a market structure where broker-dealers offer as few services as possible.

¹² See the Appendix for a description and further discussion of ABS.

¹³ Hong and Warga (2000) calculate bid-ask spreads of 13 basis points for investment grade, and 20 basis points for non-investment grade issues. Consistent results are found in Schultz (2001) and Chakravarty and Sarkar (2003) using the same data base.

financial institution. Dealers therefore often play the role of providing the service of solving a portfolio strategy-related problem for a client, and then having in inventory certain classes of bonds (along with information about the covenants and other qualifying characteristics) so that the buyer will be assured of carrying out their fiduciary responsibility.

Non-investment Grade Bond Trades

Non-investment grade debt contains a greater level of price risk, and this translates into more situations where the owner no longer finds that the bond qualifies for his/her portfolio. Also, the speculative motive to trade is greater than for investment grade issues.¹⁴ Unlike stock or investment grade bonds, the non-investment grade corporate bond universe contains many issues from companies that are private. This means that information is harder to come by, and credit analysis becomes critical (this latter point is true even for public issues). Dealers maintain research departments to track changes in such companies, and this is a function that institutional buyers are not always equipped to carry out because of the great expense.

High credit risk is often claimed to be captured in bond ratings. However, even if a bond is rated, when the information about a change in credit risk is needed most, the rating usually fails to reflect it. This is because bond ratings are only confirmatory in nature (and by design). Rating agencies often do not change ratings until several months after the event that triggers the need for a rating change (see Warga and Welch (1993)). Ratings can change 5-6 months after the marketplace has already acknowledged a change in credit risk through significant price moves (Hite and Warga (1997)).

¹⁴ See Blume, Keim, and Patel (1991).

The discussion above points to why institutional buyers often have established relationships with dealers, and the reason is the “value-added”. Dealers can provide important services without charging an explicit fee because their costs can be embedded in their bid-ask spreads. While some of the services sought by buyers can be unbundled and provided by third parties, it is often convenient to have “one-stop shopping”. For all of the aforementioned reasons, it is not surprising to find that retail trades carried out in the dealer market face a cost structure that is much higher than it probably needs to be.

Municipal Bond Trading

The Municipal Bond market differs greatly from the corporate bond market in several respects. The prime differentiator is that a significant portion of this market involves retail-sized trades (100 bonds or less) for individual accounts. According to the Bond Market Association (BMA) as of two years ago there were 1.4 million Municipal issues outstanding (about ten times the number of corporate issues). The tax advantages enjoyed by many munis and their low degree of risk (most are “AAA”, a rating often achieved through “pre-refunding” or insurance) make them an attractive investment for many individuals as a hedge against their stock and other investments. There is often little speculative motive in their purchase, even less than for high-grade corporates. Relatively small issue sizes and obscure details about specific revenue projects or taxing authority rights and privileges make these securities even less transparent than most corporates.

The muni market underwent a dramatic change in the level of price transparency beginning in 1999. The Municipal Securities Rule Board (MSRB) through the Bond Market Association (BMA) has made next-day pricing and quantity available through a

web site and data service.¹⁵ Aside from price and quantity of each transaction, it is also possible now to obtain the time of the transaction and whether the trade was a dealer buy, a dealer sale, or dealer-dealer. In a short period of time the muni market went from being one of the more opaque markets to one of the more transparent ones.

The effects of muni transparency provide a cautionary tale for those purporting dramatic changes in the corporate market. Munis remain relatively illiquid, as illustrated by the persistence of bid-ask spreads to remain at or above their previous levels. In research I have conducted based on a complete record of muni transactions in May of 2000, and for transactions in Texas and Florida in September of 2000, it is clear that spreads are at or above the levels cited for comparable issues in the study by Chakravarty and Sarkar (2003) that is based on transactions from 1995-1997. This observation is also confirmed in work described recently in the Wall Street Journal by the SEC Chief Economist Lawrence Harris and staff economist Michael Piwowar (2004) who also examine data from the year 2000.

While an update through 2004 is needed to confirm the continued high cost of transacting in the muni market (for retail trades), it is safe to say that the transparency added by the price reporting system put in place by the MSRB is at best having a slow-moving effect on the cost structure for municipal trades. This simply reflects the fact that the market is geared to institutional trading and/or is dealing with complex securities that require a costly trading environment.

¹⁵ See www.investinginbonds.com. The service started out reporting high-low prices for the day and quickly proceeded to add individual trade details. It is my understanding that near real-time reporting of municipal bond transactions is imminent.

Appendix A – The New York Stock Exchange’s ABS System

Since 1976-77 bonds have traded on the NYSE’s Automated Bond System (ABS), which can be described as a fully automated electronic trading and information system whose schedules of bid and ask prices are fully transparent. In general, trading on ABS is relatively thin and trades on the ABS are typically retail-sized (under one hundred bonds).

Despite the small size of the ABS market, the most actively traded issues not only rival the dealer market in terms of both frequency of trade and dollar volume of trade, but in some cases even dominate the dealer market. In a recent paper examining hourly trade reports from the NASDAQ-based Fixed Income Pricing System (FIPS), Hotchkiss and Ronen (2002) find that fourteen ABS-traded bonds have median transaction frequency equal to twenty-five percent of the entire dealer market, with a high figure of eighty-one percent. Based on actual transaction data collected over the 1995-1997 period, Kalimipalli and Warga (2002) find more direct evidence that frequently traded bonds on ABS often have volume equal to or exceeding the entire dealer market. Frequently traded bonds on ABS are almost exclusively non-investment grade.

Unlike its counterpart stock market, there is no specialist in the NYSE bond market. Instead, there are brokers who are subscribing members of the ABS. As of 2002, there were 58 ABS member brokers operating on about 210 terminals. The member brokers usually trade on behalf of their customers, though at times they could trade for their own account. Member brokers receive limit orders from the public and enter the corresponding bid-ask quotes and the respective quantities into the automated

system. They also enter their own quotes into the system. Liquidity to the ABS market is therefore jointly supplied by public limit orders and dealers' own quotes. The ABS matches the orders automatically and informs the member brokers once an order is executed. The ABS is thus a limit order market with a strict price-time priority. The ABS market is also very transparent. All subscribers to the ABS market have full access to the complete order schedule, which they can divulge to investors upon request.

References

Bloomfield, R., and M. O'Hara, 1999. "Can Transparent Markets Survive?" *Journal of Financial Economics*.

Blume, M., D. Keim, and S. Patel, 1991. "Returns and Volatility of Low Grade Bonds, 1977-1989." *Journal of Finance*, vol.46, no.1, March.

Chakravarty, S., and A. Sarkar, "Trading Costs in Three U.S. Bond Markets", *Journal of Fixed Income*, 2003 June, Vol.13, No.1.

Harris, Lawrence and M. Piwowar, "Municipal Bond Liquidity". SEC manuscript. 2004.

Hite, G., and A. Warga, "The Effect of Bond Rating Changes on Bond Price Performance"(with G. Hite), *Financial Analysts Journal*, Vol. 53, No.3, May/June 1997. . Abstracted in CFA Digest.

Hong, G. and A. Warga. "An Empirical Study of Bond Market Transactions", *Financial Analysts Journal*, March/April 2000.

Hong, G. and A. Warga (2004), "Municipal Marketability", forthcoming, the *Journal of Fixed Income*.

Hotchkiss, E. and T. Ronen, 2002. "The Informational Efficiency of the Corporate Bond Market: An Intraday Analysis". *Review of Financial Studies*, Vol. 15, No.5

Kalimipalli, M. and A. Warga, 2002. "Bid/Ask Spread and Volatility in the Corporate Bond Market". *Journal of Fixed Income*, March.

Madhavan, A, 1995. "Consolidation, Fragmentation, and the Disclosure of Trading Information," *Review of Financial Studies*, Vol. 8, No. 3; Fall.

Sarig, O. and A. Warga. "Bond Price Data and Bond Market Liquidity", *Journal of Financial and Quantitative Analysis*; September 1989, Vol.24, No.3.

Schultz, Paul, "Corporate Bond Trading Costs : A Peek Behind the Curtain", *Journal of Finance*, 2001, v56(2), 677-698

Warga, A., and I. Welch. "Bondholder Losses in Leveraged Buyouts", *Review of Financial Studies*, Vol. 6, No. 4; December 1993.

Figure 1: Value of Transparency is Related to Underlying Volatility

