

London Office:  
St. Michael's House  
1 George Yard  
London, EC3V 9DH  
Tel +44.20.77 43 93 00  
Fax +44.20.77 43 93 01

New York Office:  
40 Broad Street  
New York, NY 10004-2373  
Tel +1.212.440.9400  
Fax +1.212.440.5260

Washington Office:  
1399 New York Avenue, NW  
Washington, DC 20005-4711  
Tel +1.202.434.8400  
Fax +1.202.434.8456



## **TBMA U.S. RESPONSE TO EUROPEAN COMMISSION CALL FOR EVIDENCE ON PRICE TRANSPARENCY IN NON-EQUITY MARKETS**

The Bond Market Association (TBMA)<sup>1</sup> and its Asset Managers Division (AMD)<sup>2</sup> appreciate the opportunity to provide the Commission with feedback regarding the development and impact of price transparency regulation in the U.S., in particular of the Transaction Reporting and Compliance Engine (known as TRACE).

This letter therefore focuses on Questions 10 and 12 of the Commission's Call for Evidence and is structured as follows:

- (1) Brief history and current status of price transparency regulation in U.S. fixed-income markets,
- (2) Rationale behind the introduction of TRACE in the corporate bond market,
- (3) Sell-side and buy-side market participants' experience of TRACE, and
- (4) Summary and critique of recent SEC/NASD TRACE studies.

### **1 Brief history and current status of price transparency regulation in U.S. fixed-income markets**

#### ***Government Bonds***

The first consolidated system for reporting U.S. Treasury trade prices was GovPX, Inc ("GovPX"), founded in 1990, in response to concerns expressed by the U.S. Congress, the Securities and Exchange Commission (SEC) and other Governmental authorities that there was inadequate price transparency in the U.S. Treasury market. GovPX was formed with guidance from TBMA working with government and regulators on solutions to the issues of price dissemination and price transparency. The Association recommended the formation of an industry-wide joint venture to meet the policy goal of expanding access to government securities price information through

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<sup>1</sup> TBMA is a trade association that represents approximately 200 securities firms, banks and asset managers that underwrite, trade and invest in fixed-income securities in the United States and in international markets. Fixed income securities include U.S. government and federal agency securities, municipal bonds, corporate bonds, mortgage-backed and asset-backed securities, money market instruments and funding instruments such as repurchase agreements. TBMA is expected to merge with the Securities Industry Association (SIA) in November 2006. More information about TBMA and its members and activities is available on its website [www.bondmarkets.com](http://www.bondmarkets.com), and information regarding the SIA is available on its website at [www.sia.com](http://www.sia.com).

<sup>2</sup> The AMD is a division of TBMA that represents 22 institutional investment management firms with over \$9 trillion in assets under management. More information about the AMD and its members and activities is available on its webpage:

<http://www.bondmarkets.com/category.asp?catid=73&image=assetmanagers>

private-sector initiatives. Over the years, GovPX expanded its coverage of real-time price and volume information beyond Treasury securities transactions to include agency and GSE securities transactions, swap transactions and repo transactions. GovPX provides real-time trade price and volume information for U.S. Treasuries from the inter-dealer market. The information is made available on the Internet and is distributed by information vendors.

Over time, secondary trading in U.S. government securities has become largely automated. Inter-dealer brokers transact through proprietary electronic trading platforms (eg eSpeed, Brokertechn) that allow dealer members to see active trading prices and immediately hit live bids and lift offers. Perhaps the single most important development for price transparency to institutional clients has been the growth of multi-dealer-to-customer platforms(eg TradeWeb), which provide to institutional customers real-time comparative dealer prices as well as immediate post-trade prices of trades executed on the system. The trading volume on these multi-dealer customer platforms has grown significantly in the last few years, and as a result, the pre-trade real-time prices displayed by such platforms have become an increasingly accurate reflection of the market. As pre-trade prices have become more accurate, post-trade prices may lose significance<sup>3</sup>.

The result of such extensive automation is that many participants in today's U.S Treasury market have access to real-time market pricing information around the clock. By subscribing to pricing services, trading with dealers through their proprietary trading systems and/or joining a multi-dealer trading system member, institutional customers can access substantially the same pricing information as primary dealers.

### ***Municipal Bonds***

In 1995, the Municipal Securities Rulemaking Board (MSRB), the self-regulatory organization for the U.S. municipal bond market, began collecting the details of dealer-to-dealer transactions in the U.S. municipal bond market and distributing daily summary reports of price and volume information about municipal securities that traded at least 4 times during the day. The threshold was ultimately reduced in 2002 to a minimum 2 trades during a day. In August 1998, these reports were expanded to include customer trades as well as inter-dealer trades. These prices were made available to the public for the first time in November 1998, when The Bond Market Association began to display the daily summaries on its retail-focused internet website, InvestingInBonds.com. The web page on which the prices appeared received 17,000 hits in its first three weeks of operation. The MSRB followed up with a series of measured steps, all aimed at increasing transparency. By the year 2000, the MSRB was making all trading data publicly available on a "day after the trade" ("T+1") basis. As of late January 2005, the MSRB began making available "real time" trade prices for all municipal bond trades within 15 minutes of a trade via the InvestingInBonds.com website.

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<sup>3</sup> "The [GovPX] data lost some of their relevance for the on-the-run market when eSpeed and BrokerTec began to attract an ever larger proportion of this type of trading around the turn of the millennium. ICAP bought GovPX in mid-2004, and this also affected the usefulness of the data." CEPR research on "European Government Bond Markets: Transparency, liquidity, efficiency", page 30.

## *Corporate Bonds*

Over several years, NASD, Inc., a self-regulatory organization, has put in place the trade dissemination engine known as TRACE. The NASD rule mandating the reporting of trades in TRACE-eligible securities was first proposed in 1999, and took effect on July 1, 2002. A Bond Transaction reporting Committee (“BTRC”) was formed between the NASD and TBMA to advise regulators on implementation of price transparency. The slow process of rollout allowed for a smoother implementation of mandatory price transparency.

The TRACE system applies to so-called TRACE-eligible securities. That includes all US\$ denominated book-entry eligible securities, and issued by U.S. or foreign private issuers; and either registered under the Securities Act of 1933 or privately placed. It does not include debt issued by government-sponsored entities, MBS or ABS, collateralized mortgage obligations or money market instruments.

At inception, all transactions in TRACE-eligible securities were required to be reported to the NASD within 75 minutes. The time frame was reduced over the course of 3 years to 45, 30 and on July 1, 2005, to 15 minutes.

Dissemination of reported prices to the public was also rolled out in phases:

In **Phase I** (July 2002), all trades in investment grade bonds with an original issuance size of \$1 billion or greater and high yield bonds in the so-called FIPS 50 were publicly disseminated. Trades of investment grade bonds in an amount larger than \$5 million in face value are disseminated only as 5MM+, and high yield trades of more than \$1 million face value are disseminated as 1 MM+. Under this phase, prices for about 500 bonds were disseminated, representing 50% of the investment grade trading volume.

**Phase II** (March 2003) extended dissemination to all transactions in investment grade bonds rated A or above with an issuance size of \$100 million or greater, and a group of 120 selected BBB bonds and 50 high yield bonds (about 4,400 bonds, representing about 65% of investment grade trading volumes).

**Phase III** (February 2005) required real-time dissemination of all transactions in publicly offered (i.e. not 144A) TRACE-eligible securities. However, in response to continued concerns that liquidity would be harmed by immediate transparency of large transactions in lower rated, illiquid securities, delayed dissemination was allowed for (1) trades greater than \$1 million in infrequently traded securities rated BB and below (delay of 2-4 days), and (2) trades in securities rated BBB and lower during the period immediately following their issuance (delay of 2-10 days following issuance).

**Phase IV** (November 2005): all remaining delays in the dissemination of trade information for TRACE-eligible securities were eliminated.

The NASD has recently submitted to the SEC a rule proposal that would provide an extended period of time to report transactions in TRACE-eligible securities executed

in connection with the termination or settlement of a credit default swap or a similar instrument and would not require dissemination of information on certain transactions (e.g., transactions with certain terms) in TRACE-eligible securities executed in connection with certain types of options, CDS or similar instruments.

The NASD has also recently submitted a rule proposal that would require the reporting of securities exempt from registration under Section 3 of the Securities Act of 1933, as amended. This proposal presents a number of issues, and is pending notice from the SEC.

### ***Statistics from TRACE***

According to an NASD report in June 2004, there were 29,000 TRACE-eligible issues. Of those, only 4,700 (16.2%) traded at least once each day. Only 5% of the eligible issues trade, on average, 5 or more times per day. Less than half (46%) of all eligible issues trade at least once a month.

### ***Access to TRACE Data***

TRACE data is available real-time from the NASD and data vendors on a subscription basis and a 15 minutes delay basis free of charge on the NASD's website and on TBMA's InvestingInBonds.com website, provided that the user must certify that its access to the data is for personal use and not for commercial purposes.

## **2 Rationale behind the introduction of TRACE in the corporate bond market**

According to U.S. regulators, the TRACE system was designed to promote price transparency in the corporate debt market, and to enable regulators to better detect misconduct. Regulators suggested that the TRACE system was needed to protect investors. We believe that the regulators were primarily focused on protecting retail investors rather than institutional investors. For instance, the NASD cited on multiple occasions significant retail activity, defined as trades under \$100,000, across all credit grades of corporate bonds as justification for TRACE<sup>4</sup>.

## **3 U.S. sell-side and buy-side market participants' experience of TRACE**

TBMA, through its Corporate Credit Division and its Asset Managers' Division, has been heavily involved in discussions with U.S. regulators regarding price transparency. The sell-side and buy-side views on the topic are summarised below; however, there is an important consensus among the two which can be summarised as follows: price transparency is a good thing, but not at the expense of liquidity.

### **Broker-dealer views**

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<sup>4</sup> NASD reports 65% of trades are retail size (\$100,000 or less), but they represent only 1.8% of dollar volume.

As an initial matter, broker-dealers believe that the roll-out of TRACE in phases was integral, as it gave them time to make expensive and laborious changes to their systems.

While broker-dealers recognize the benefits of transparency, they believe that TRACE has resulted in reduced liquidity, which has ultimately harmed investors who wish to move large blocks of securities.

Broker-dealers note that TRACE has substantially reduced profit margins and that, as a result, small broker-dealers in particular may be forced to exit the corporate bond market, as First Albany Securities, a U.S. regional dealer, did in May 2006<sup>5</sup>. While large institutional investors may be indifferent to the exit from the market of regional firms who cannot afford to match the price-making of larger dealers, ultimately, regional customers whose trades are too small to interest the larger dealers are likely to suffer. Fewer bids and reduced competition may result in less optimal prices for investors.

In addition, broker-dealers believe that liquidity as measured by volume has decreased by approximately 30% since TRACE was enacted (based on MarketAxess data) and by as much as 40% on some issues based on round lot trades, and that bid/ask spreads have compressed.<sup>6</sup> Furthermore, broker-dealers are now doing more proprietary trading (ie less client-facing) than in the past. As a result of this transparency and spread compression, broker-dealers are less willing to use their capital to obtain improved prices for customers selling large blocks of securities, especially for less liquid and more credit sensitive securities. With the enactment of TRACE, broker-dealers are less likely to be able to sell the security for a price the dealer believes will compensate it for putting its capital at risk, which creates a disincentive for aggressive price quotes. The broker-dealer view is substantiated by a 2003 study which indicates that investors would prefer that prices not be shown when they are selling a bond.<sup>7</sup> Informal interviews with investors suggest that this is still the case.

Broker-dealers note that the U.S. has been in a relatively benign credit environment over much of the TRACE history, and that when the credit cycle turns, they expect to see lower trade volumes, and potentially, situations where one trade can move or price the market.

Broker-dealers also note that TRACE has effectively inhibited the development of cash market-trading, and may have been one of several contributing factors to the movement to CDS trading<sup>8</sup>. However, such products are not necessarily an optimal

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<sup>5</sup> See press release: <http://phx.corporate-ir.net/phoenix.zhtml?c=116068&p=irol-newsArticle&t=Regular&id=850608&>

<sup>6</sup> Information is anecdotal, as the NASD has not released data necessary to analyze the impact of TRACE. The NASD recently released a notice to members regarding disseminating historic TRACE data. TBMA has requested data to analyze the impact of TRACE on the market, including on trading volume.

<sup>7</sup> "Institutional Investor Views on Transparency in the Below Investment-Grade Credit Bond Sector," study by Greenwich Associates, November 2003.

<sup>8</sup> "While [U.S.] CDS volumes have skyrocketed, traded volumes in the underlying cash bonds have fallen six quarters in a row" ("A Spectacular Parting of the Ways", Financial Times, 23 August 2003)

solution to the liquidity crunch and other issues noted earlier. For instance, some investors, such as mutual funds, are prohibited from investing in non-cash securities. In addition, there may be issues with the volume of CDS trading in relation to the underlying deliverable cash securities.

Broker-dealers believe that if TRACE is to continue, regulators should be very cautious about the type of information that is disseminated (i.e., information regarding whether the dealer's customer was another broker-dealer or a customer and whether the broker-dealer was the buyer or seller should not be included) and ensure that there are extended time delays associated with such dissemination. In addition, regulators should focus only on dissemination of any information about smaller size-trade and for the most liquid securities.

### **Buy side views**

U.S. asset managers have more variance in their views on TRACE<sup>9</sup>, depending on whether the senior management (more in favour) or senior traders (less in favour) are approached. U.S. asset managers' views are also dependent upon the focus and size of their businesses (e.g. fund managers involved in significant high-yield debt trading were more concerned about the potential negative effects of price transparency on market liquidity than fund managers who manage actively traded fixed-income investments. By virtue of the nature of the market, high yield fund managers are more likely to be impacted).

Generally, the traditional buy-side is in favour of TRACE insofar as it supports pro-competitive business practices. The AMD believes that TRACE has brought more price transparency to the corporate bond market, which has enabled asset managers to elicit more competitive price quotations from dealers. On the other hand, some individual buy side firms have noted that while TRACE has increased price transparency, it has also made it more difficult to sell large blocks of non-investment grade securities for optimal prices. Buy-side firms generally view TRACE as another source of helpful market information for them and see it is beneficial in that it helps keep bid/ask spreads compressed. Asset managers typically use third-party pricing services, not TRACE price information, for the purposes of their own end-of-day portfolio valuation requirements. Neither do they typically rely on TRACE price data alone to verify best execution - several factors other than price are also important to consider.

Asset managers are, however, supportive of restricting dissemination of certain information. Much like the sell side, it recently dissented against the NASD proposal to release information regarding who the customer or broker-dealer is in a transaction and whether the transaction is a buy or a sell. The AMD believes that such information would result in transparency of trades rather than transparency of prices and

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<sup>9</sup> See AMD June 2006 comment letter to the NASD relating to TRACE at [http://www.bondmarkets.com/assets/files/trace%20comment%20letter\\_amd.pdf](http://www.bondmarkets.com/assets/files/trace%20comment%20letter_amd.pdf). See also the comment letter of the Senior Executives Group of the Asset Managers' Forum (AMD's ancestor) to the NASD on Mark-up Policy at <http://www.bondmarkets.com/assets/files/SR-NASD-2003-141.pdf>

therefore, it could reveal trading strategies rather than the intended result of providing price transparency<sup>10</sup>.

The buy side, as well as the sell side, has also been supportive of lengthy delays in the transmission of other TRACE information, such as uncapped volumes and whether the broker-dealer acted as agent or principal and has called for the exclusion of certain information such as the broker-dealer's MPID information and counterparty information and information regarding transactions in 144A securities.

In sum, major asset management firms generally support industry and regulatory enhancements that favour transparency in bond markets, so long as these enhancements do not have detrimental, albeit unintended, consequences for investors, such as a possible reduction in available liquidity and any publicly disseminated information that might reveal the parties to a trade.

#### **4 Summary and critique of recent SEC/NASD TRACE studies.**

The principal academic research studies on the effect of TRACE on the U.S. corporate bond market have been commissioned by the NASD's Bond Transaction Reporting Committee, and staff economist research at the U.S. SEC. These studies are reviewed:<sup>11</sup>

##### SEC

- "Corporate Bond Market Transparency and Transaction Costs" Amy K. Edwards, Lawrence E. Harris and Michael S. Piwowar, September 1, 2004

##### NASD BTRC

- "Transparency and Liquidity: A Controlled Experiment on Corporate Bonds", Michael Goldstein, Edith S. Hotchkiss and Erik R. Sirri, March 20, 2006, updated from November 1, 2004
- "High-Yield Active and Inactive Bonds and Transparency" by Michael Goldstein and Edith Hotchkiss, June 24, 2005

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<sup>10</sup> See AMD comment letter filed with the NASD, available at:

[http://www.bondmarkets.com/assets/files/trace%20comment%20letter\\_amd.pdf](http://www.bondmarkets.com/assets/files/trace%20comment%20letter_amd.pdf)

<sup>11</sup> An additional study is noted but not reviewed, "Market Transparency, liquidity externalities and institutional trading costs in corporate bonds" by Hendrik Bessembinder, William Maxwell and Kumar Venkataraman accepted for publication on October 3, 2005 by the Journal of Financial Economics, which analyzed the effect of TRACE dissemination and relied on the National Association of Insurance Commissioners, NAIC, data (and thus looks at insurance company corporate trade activity) rather than TRACE data which were the principal data source for the studies reviewed. The conclusions are generally consistent with those analyzed here and subject to similar criticisms, in particular, the study does not analyze the relationship of TRACE reporting and dissemination to the direct measure of liquidity, trade volume. It should be noted that this paper largely analyzed data before and after TRACE dissemination in 2002, a period in which there was minimal high-yield bond dissemination and thus this study acknowledges that the results thus are less meaningful for the high-yield market. (Page 26). It also acknowledges limitations in the NAIC data which its methodology is designed to address. The study concludes by recommending further research on the effect of TRACE on investors, market makers and issuers by stating "Additional investigation in relations between market transparency, liquidity and informational efficiency is warranted". (Page 38)

- “Additional Report on Active and Inactive High-Yield Bonds”, by Michael Goldstein and Edith Hotchkiss, September 8, 2005

We set-out below our general comments applicable to all these studies and, in Annex A, we review in more details, and for each one of them, the findings, methodology used, and provide our critique.

### **General Comments on TRACE Research**

#### *Methodologies Need to Be Refined Before the Research Can Be Used as a Guide to Policymaking*

The studies applied quantitative statistical analysis to the TRACE data and drew conclusions based on the statistical results. They generally concluded that increased price dissemination (post-trade price transparency) would result in either lower transaction costs (tighter bid-ask spreads) or at worst, that spreads were unaffected and declined with transaction size. As discussed below, there are significant methodological issues to be addressed. In addition, the studies were generally conducted during a time (2003-2005) of relatively benign and improving credit conditions, reduced volatility and credit spread tightening, or historically tight spreads from the higher credit risk conditions a few years earlier.<sup>12</sup> Consequently, before these conclusions can be accepted as a basis for policy development, the methodologies should be further refined and the results confirmed. In certain cases, the findings appear to be contradictory or at least difficult to explain, thus requiring further investigation. Even if one accepts the statistical results, the studies still make unsubstantiated logical leaps to reach the conclusion that greater transparency leads to greater liquidity.

#### *Most TRACE Studies Do Not Analyze in any Detail the Effect of Post-Trade Price Dissemination on Liquidity as Defined by Trading Volume*

Most of the studies defined and measured liquidity by bid-ask spreads rather than the more direct measure, trade volume. Although spreads are the common measure of liquidity found in academic literature, a narrowing of spreads can be explained by other factors, and does not necessarily indicate increased liquidity. It is not surprising that spreads decrease with transparency. Approximately 98% of trading volume in bonds is institutional in nature and such customers have the market power to force dealers to accept lower prices than the dealers may otherwise believe provides adequate compensation for the risk of committing capital. There is thus a risk that dealers will stop making markets in risky securities for all but their most profitable customers. In particular, the studies that focused on the high-yield sector measured “liquidity” by bid-ask spreads. This market is most vulnerable to reduced liquidity in a price transparency mandated environment, and thus a trade volume analysis in the TRACE price dissemination environment would have been quite useful and relevant.

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<sup>12</sup> The one possible exception was the last of the NASD studies that included the period of the Ford and GM downgrades to high yield status but, even in this case, the corporate bond markets rebounded following those episodes.

Only one of the studies reviewed examined trade volume, and it found that volume declined during the TRACE price dissemination phase-in period studied. However, the study concluded that the volume differential could not be attributed to TRACE on a statistically significant basis. Furthermore, the study only looked at BBB rated bonds, a small portion of the corporate bond universe.

#### *Weak Link Between Statistical Findings and Conclusions*

The studies' conclusions in many cases do not necessarily follow from the statistical evidence presented and their assertions are open to question. For example, based on the statistical findings, the NASD paper in 2005 suggests that dealers have a greater incentive, make a greater effort and offer better prices to dispose of less liquid bonds. The case can easily be made that dealers have less incentive to make markets and invest capital or put their capital at risk in less liquid bonds under a post-trade price dissemination regime.

#### *Available Data Show Declining Trade Volume During TRACE Implementation Period*

Contrary to the research studies' implication that liquidity would increase with increased post-trade transparency, there is evidence that suggests post-trade transparency may have resulted in a decline in liquidity as measured by transaction volumes during the TRACE implementation period. For example, the Federal Reserve Bank of New York's data on primary dealer corporate bond trading volume shows that trading volume, as a percentage of outstanding corporate bonds, has generally declined during the TRACE implementation period.<sup>13</sup> MarketAxess' estimate of quarterly publicly disseminated TRACE trading volume also shows a decline over the TRACE implementation period from 2003-2005<sup>14</sup>. However, the MarketAxess data analysis is subject to the limitation that the NASD currently does not publicly disseminate the exact size of large trades, even on a delayed basis. Investment grade corporate trades above \$5 million are reported as "\$5 million +" and high-yield trades above \$1 million are reported as "\$1 million +".

#### *Academic and Private Sector Researchers Do Not Have Access to Exact Trade Size Data Critical to Price Transparency and Liquidity Analysis; Recent NASD Proposal Could Remedy the Problem*

To date, only NASD and SEC sponsored research have had access to all information reported to TRACE, including exact trade size. Such information has not been available for academic and private sector research. The NASD has requested comments, due in August 2006, on a proposal to provide public access to TRACE data that was not previously disseminated or otherwise publicly available, including the exact size of trades<sup>15</sup> (e.g., investment grade trades above the \$5 million and high-yield trades

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<sup>13</sup> The New York Fed's trade volume data series defines corporate bonds broadly to include non-agency or private label REMICs.

<sup>14</sup> MarketAxess, A Primer on CDS Electronic Trading, January 11, 2006, page 8

<sup>15</sup> See NASD Notice to Members 06-22 – Request for Comment on Providing Public Access to Historic TRACE Data. The Bond market Association's response may be found at <http://www.bondmarkets.com/assets/files/TRACE%20historical%20data4.pdf>

above \$1 million thresholds). TBMA supports dissemination of such information on an 18-month delayed basis.

#### *Numerous Policy Benefits to Wide Availability of TRACE Trade Size Data*

The proposed NASD release of the actual data size would have a number of public benefits:

- The U.S. TRACE experience is a valuable source of information. The full data set would enable objective third-party review, analysis and interpretation of the TRACE data for policy development.
- The data would allow testing of the NASD/SEC research results and the investigation of methodological issues, some of which were identified by the authors themselves. Most of the studies focused on segments of the market but not the entire TRACE data set.
- The data would allow observers to investigate the generally asserted but unproven link between transparency and liquidity.
- Having access to actual trade data would nullify the need to make assumptions about trading activity, especially trade size, an inadequate basis for analysis and policy making.
- A number of the studies have focused on the high-yield sector. There are other relevant and necessary market segments with important policy implications, the most obvious being illiquid issues, whether investment grade or high yield.

#### The Centre for Economic Policy Research (CEPR) Review of the TRACE Studies

It is instructive to also summarize some comments on these studies in the CEPR Research report, “European Corporate Bond Markets: transparency, liquidity and efficiency”, published in May 2006. CEPR’s reporting of the studies is consistent with our analysis, although their analysis focuses more on research approach and findings and our emphasis is placed more on the implications of the studies and, in some respects, builds on CEPR’s analysis.

CEPR raises a number of interesting questions, including the TRACE research study findings of transparency having less of an effect on illiquid than liquid bonds, the limited effect of transparency on trading volume and the relative spreads of liquid vs. illiquid bonds. They correctly observe that these questions require further research, especially since there have been relatively few studies to date of the interaction of transparency, trading costs and liquidity since the introduction of TRACE in the U.S.. CEPR’s study is an initial effort in another area deserving further study, comparison of the U.S. and European bond market microstructure.

## Appendix A - Critique of Specific Studies

### SEC

*“Corporate Bond Market Transparency and Transaction Costs” Amy K. Edwards, Lawrence E. Harris and Michael S. Piwowar, September 21, 2004*

#### Key issues

- Authors introduced innovative and complex analytical approach but measurement issues remain to be resolved and methodologies refined. Method relied on econometric modelling rather than direct estimation to address lack of (contemporaneous) data problem which tends to make the results less accurate especially outside of a certain trade size range, e.g. very large trades.
- Key finding relates to the cost of bond trades relative to equity trades. It is not clear whether commission expense is treated comparably in the bond and equity contexts which would affect validity of relative cost findings.
- Concluding assertions regarding relative credit risk exposure and cost of managing bond inventories also need to be questioned or at least explained more fully.
- Conclusion that greater (TRACE-mandated post-trade) transparency leads to liquidity is not explicitly proven in the statistical findings and could be explained by unrelated market developments (e.g. growth of e-trading, growth of the CDS market).
- Conclusions on the U.S. experience ignore the effect of private sector initiatives adding to the development of transparency in the European fixed income markets, where bid-offer spreads are generally lower than in the US absent TRACE.

#### Findings summarized

This SEC staff research study estimated average cost as a function of trade size for each bond that traded more than nine times in 2003 based on TRACE data. The paper states that cost (or spread) is higher for corporate bonds than for equities, that cost declines with trade size, and that highly rated bonds, recent issues and bonds close to maturity have lower transaction costs. As noted below, it is not clear that the study treats commissions the same for TRACE disseminated bond trades and equity trades. The authors conclude that TRACE has had public benefits based on the finding that costs are lower for bonds with publicly disseminated prices and decline when TRACE begins to publicly disseminate their prices.

#### Methodology

The researchers apply and extend a regression estimation methodology introduced in the Harris/Piwowar study on municipal bonds<sup>16</sup>. Simply summarized, the authors use bid-ask spread as the dependent variable and bond characteristics as the explanatory variables. The statistical techniques are considered innovative and complex, and will

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<sup>16</sup> Lawrence E. Harris and Michael S. Piwowar, “Secondary Trading Costs in the Municipal Bond Market”, 2004.

lead to additional research and refinement of the cost function estimation. As with any introduction of a new approach to measure financial market behaviour though, there still remain measurement issues to be resolved, a number of which were identified in the study. Even the authors suggest that results should be interpreted with caution.

The authors identified two “serious problems” confronting the analysis of this type that the methodology is expected to address. First, transaction costs for each trade cannot be estimated directly using standard transaction methods (quotation data for a large number of trades were not available), but must estimate costs based on econometric estimation methods. Second, there is a scarcity of data for many bonds based on infrequency of trades in certain issues. Thus the estimates are less accurate than they otherwise would be if there had been access to information from contemporaneous and more frequent observable benchmark prices<sup>17</sup>. The econometric modelling was developed to overcome the problems of the data scarcity. The authors also note that estimates are less accurate for (large) bond transaction sizes, for which there are few trades.

The authors identify a multicollinearity problem (correlated and large estimated error terms may affect the explanatory power of an econometric model) in the earlier Harris/Piwowar study due to correlation between cost function coefficients or “regressors” that result in large and related error terms. The study applies statistical techniques to minimize the problem, and the authors state that this study did not have the same problems with respect to the linear combination of coefficients within a range of trades as in the municipal study. The estimates derived from the model are less reliable or accurate (e.g. fraction of trades with negative cost estimates) for large trades.<sup>18</sup>

The authors’ data do not include exogenous information that could explain why some bonds trade more frequently than others, which limit the type of equations that can be presented<sup>19</sup>.

Potentially the most significant criticism of the study is that there does not appear to be explicit recognition that TRACE prices include a commission equivalent adjustment and equity prices did not include commissions. Therefore, there may be a fundamental flaw in equity and bond data comparability and consequently the factual premise on which this conclusion is based would then also be flawed if commissions were not treated similarly for bond and equity trades. If this is the case, correcting for the commission adjustment could very well reverse the findings with respect to the relative cost of equity and bond trades.

## Conclusions

The study finds that statistical tests rule out the role of fixed costs as an explanation for the difference in trading costs, or spreads, between small and large trades. At the same time, they assert that the reason must be a large institutional investor bargaining

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<sup>17</sup> Edwards, Harris and Piwowar Page 10

<sup>18</sup> Edwards, Harris and Piwowar Page 14

<sup>19</sup> Edwards, Harris and Piwowar Page 19

advantage because of greater access to market information. They do note the effect of fixed costs on small trade transaction costs, “while fixed costs probably account for much of the average cost function for small trades, they do not explain the reduction in costs over the entire range.”<sup>20</sup> Despite the obvious importance of spreading fixed costs in explaining decline in transaction costs as trades get larger, their conclusion with respect to corporate bond trading costs focused on a lack of transparency and negotiation advantages, especially compared to equity markets. As noted above, with respect to the calculated difference in bond and equity transactions, the authors do not appear to explicitly address the fact that TRACE prices include a commission equivalent and equity prices do not include commissions which may explain some, if not much, of the differential.

Based on the statistical analysis, the authors then make a number of conclusions that must be at least questioned. For example, the assertion that equities are subject to “much more” credit risk than corporate bonds, fixed-income credit risk can be hedged in the equity markets, and that inventories can be more easily managed in fixed income than equity markets since corporate bond prices are highly correlated to those of other bonds and derivatives. The conclusion that inventory is easier to trade in the debt markets is not necessarily true as there is more trading volume per CUSIP in the equity markets, and equities almost invariably have constant, two-sided quotes. The reason given for that assertion—that there is less credit risk exposure in debt instruments—is not supported by the analysis and is also not necessarily true. The corporate bond universe includes investment grade, high-yield, distressed and emerging market securities, representing a wide range of credit risk exposure<sup>21</sup> and correlation to other fixed-income instruments.

The study finds that greater price dissemination would result in lower transaction costs. The authors then conclude that transparency enhances liquidity based solely on the lower transaction cost finding, without additional evidence or analysis, that is, without explicitly analyzing the transparency and liquidity relationship. Transaction costs and liquidity are not synonymous in the absence of analysis of the effect of transparency on trading volume.

Finally, the conclusion that “additional (TRACE-driven) transparency will likely permit creation of new market structures and innovative dealing strategies”<sup>22</sup> is unproven by the research. Recent market driven developments in Europe have emerged in the absence of regulatory mandate, e.g., expansion of electronic trading platforms. In fact, the study by the Centre for Economic Research earlier this year found that “the liquidity of euro-denominated bonds compares favourably to that of their post-TRACE U.S. counterparts”, with liquidity measured in terms of spread. This suggests that the trading costs are affected by more than transparency. The study concluded

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<sup>20</sup> Edwards, Harris and Piwowar Page 16

<sup>21</sup> With respect to the equity vs. bond spreads, it should be noted that CEPR’s review of the TRACE research as part of its “European Corporate Bond Markets: transparency, liquidity and efficiency” study stated that “this ranking is surprising as one would expect spreads to increase in risk and adverse selection, which are likely to be greater for stocks than bonds and also for larger trades.” (page 16). CEPR comments that the results to some degree could reflect the credit conditions in the bond market at that time.

<sup>22</sup> Edwards, Harris and Piwowar Page 27

that competition is a key driver of liquidity and thus the conclusion for public policy focus on “openness and competition”.<sup>23</sup>

### **NASD Research**

“Transparency and Liquidity: A Controlled Experiment on Corporate Bonds”, Michael Goldstein, Edith S. Hotchkiss and Erik R. Sirri, March 20, 2006, updated from November 1, 2004

#### **Key issues**

- The study analyses a narrow segment of the corporate bond market (BBB-rated bonds); thus conclusions about the liquidity and transparency relationship should be analyzed with caution.
- Round trip trade methodology further limits the number and type of trades in the analysis.
- Trade volume decline was found to be significant during the period studied (when TRACE began phasing in BBB price dissemination), although the authors did not attribute the volume decline in most cases to increased transparency based on their tests of statistical significance.
- Authors found the lack of increased trading activity during a period of increased transparency “interesting”.
- Conclusion that dealers make greater efforts to dispose of less liquid bonds is open to question and goes beyond the statistical findings. It is equally likely that dealers have fewer incentives to make markets in less liquid bonds in a post-trade price transparency environment and thus will only act on a riskless principal basis, which may mean it will take longer for an investor to find a willing buyer for a position in its portfolio.
- Less benefit to post-trade transparency found for less frequently traded bonds, as the last trade price may be days or weeks old.
- Study did not address the numerous bond pricing sources already available in Europe nor their effect on price availability and transparency.]

#### **Findings summarized**

The research study looked at the last sale reported for BBB-rated bonds to assess the liquidity effect of TRACE price dissemination. The authors compared TRACE disseminated BBB bonds before and after the introduction of TRACE mandated post-trade price dissemination with similar bonds (the “control group”) that was not subject to TRACE dissemination at the time. As the study looked at only BBB bonds, broad conclusions regarding the transparency and liquidity link should be made with great care since only a small portion of the corporate bond universe was analyzed.

The authors measured both transaction volume and bid-ask spreads, and referred to spreads as a “measure of liquidity.” The authors thus conclude that transparency has either a neutral or positive impact on liquidity. The study found that spreads declined

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<sup>23</sup> CEPR, “European Corporate Bond Markets: transparency, liquidity and efficiency”, May 2006, page 5.

with TRACE price dissemination (compared to the control group) except for large trades, and had little effect on infrequently traded bonds from increased transparency.

The authors used two measures of trading activity: average trading volume and trades per day. The study's measures of trading volume – a generally used measure of liquidity – showed declines for both the disseminated and control group but no statistical difference between the non-disseminated and disseminated groups of BBB bonds, and indicated that transparency does not lead to “greater trading interest”<sup>24</sup>.

### Methodology

The study constructed a controlled experiment during part of the phase-in of the TRACE system constructing two groups of BBB bonds, TRACE-disseminated and a non-disseminated control group. The study looked at TRACE reported trade information for the 120 selected BBB bonds—90 actively traded and 30 inactively traded. Trades for the rest of the BBB-rated market were not disseminated and thus served as a control group.

The authors had full access to all TRACE reporting data available for the study. The sample covered trades executed between 8 July 2002 and 27 February 2004, the period of the study. (TRACE began disseminating price information on BBB bonds on 14 April 2003.) The estimation of bid-ask spreads were based on dealer round trip trades (dealer buys the bond and then sells the same bond) within a specific period of time and regression equations to estimate the difference between transaction prices and the previous day bid prices as reported by Reuters. It should be noted that the round trip methodology restricted the universe of trades to those that were part of a round-trip transaction. Bonds had to trade at least once a week to be included. The sample also excluded convertibles, “bonds with unusual features” and issues larger than \$1 billion (which had already begun dissemination before July 2002), and newly issued bonds.

The study also had to account for the effect that market variables such as interest rates and credit conditions during the time interval of the round trip trade. This was the reason for keeping the time interval short and analyze bonds with one and five day round trips.

The limitation with the econometric approach is that it relies on statistically generated estimates rather than actually observed prices. The accuracy of the econometric equations was better for small trades than the largest trades.

### Conclusions

Trading volume fell during the observation period for both disseminated and non-disseminated bonds, and the decline was statistically significant with the volume dropping 30 to 40 percent. Although the authors find that transparency generally did not have a measurable effect on trade activity, one measure, the difference in trade volume change between disseminated and non-disseminated bonds, was found to be

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<sup>24</sup> Goldstein, Hotchkiss, Sirri Page 3

statistically significant in comparing the 90 active BBB bonds that were disseminated to the non-disseminated group.

The authors commented that “the fact that we do not observe an increase in volume with the introduction of transparency is particularly interesting since we simultaneously observe a decrease in spreads”<sup>25</sup>, which contradicts the unproven implication (especially if we define liquidity as an increase in trade volume) suggested in the SEC study’s conclusion that liquidity may increase as a result of price transparency. Spreads were found to be higher for smaller trades in keeping with the SEC study findings and in the TRACE trade price disseminated group (compared to the control group prior to dissemination), but decline after dissemination<sup>26</sup>.

The study found that declines in spreads after dissemination varied with trade size (the largest relative decline was found in the intermediate trade size group and spreads were actually found to increase after dissemination for the smallest trade size group for the 90 actively traded bonds although the result was not considered to be “robust” for choice of the control group) and trading activity. The authors also concluded that “although dealers on average charge lower spreads for larger trades, they are also more apt to lose money on those trades”.<sup>27</sup> The authors found spreads to be lower for thinly traded bonds relative to actively traded bonds up to \$250,000 (but spreads “somewhat” higher for thinly traded bonds with trades over \$250,000) in trade size for the disseminated group.

For some trade size groups, spreads are found to increase with trading activity and thinly traded disseminated bonds stay in inventory for a shorter period of time. The researchers then make the assertion not supported by evidence that dealers have a greater incentive, make a greater effort, or take lower profits to dispose of less liquid bonds. A logical question is: what is the incentive to make markets in less liquid securities in a post-trade price transparency environment, if the result is lower profits? If these results are confirmed in other tests, further research is necessary to understand the reason for the results which seem to run counter to what might be expected.

The authors make the rather logical point regarding the value of post-trade prices for inactively traded bonds. “For inactively traded bonds, the effects of transparency may not be as large as originally expected for less active bonds,” the authors write. “The last sale information would be days or weeks old ... and be of less value.”<sup>28</sup>

The authors then conclude that the benefits of dissemination are greatest for the most actively traded bonds with little effect of transparency on “very thinly traded bonds”. However, there is already a great deal of information available for most actively

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<sup>25</sup> Goldstein, Hotchkiss, Sirri Page 13

<sup>26</sup> On page 17, the study note differences in results in spread results in the two studies, i.e. report lower trading costs for very small and very large trades with intermediate size trades showing more similar results.

<sup>27</sup> Goldstein, Hotchkiss and Sirri .Page 17

<sup>28</sup> Goldstein, Hotchkiss and Sirri, page 28

traded bonds through numerous pricing sources and the private sector is developing additional pricing source structures in Europe.<sup>29</sup>

*Second Set of NASD Studies “High-Yield Active and Inactive Bonds and Transparency” by Michael Goldstein and Edith Hotchkiss, June 24, 2005*

*“Additional Report on Active and Inactive High-Yield Bonds” ” by Michael Goldstein and Edith Hotchkiss, September 8, 2005*

#### Key issues

- Liquidity defined only by bid-ask spread and not by trade volume.
- Three-way round trip trade spread measured, i.e. difference between the price at which the dealer bought and sold the same bond. There may be market events between the buy and sell transactions that would have affected the measured spread.
- Questionable conclusions based on the finding that inactive bonds had smaller spreads. As noted in the discussion of the previous BBB study, such analysis does not make the case for dealers investing capital, holding in inventory and making markets for inactively traded high-yield bonds.

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<sup>29</sup> The Bond Market Association, *European Bond Pricing Sources and Services: Implications for Price Transparency in the European Bond Market*”, April 2005.

## Summary of the findings

The authors characterized the results as “preliminary” with the first study covering 1 October 2004 to 6 February 2005 and the second study covering the 7 February to 30 June 2005 period, with results substantially the same for both studies. The broad conclusion was to “find no evidence of significant problems for large transactions of infrequently traded bonds in Phase III (the final phase-in period) of TRACE.”

The study focused on inactively traded, below-investment-grade bonds that trade less than 20 times in a 30-day period. Using TRACE data, their methodology involved looking at the same bond that is bought by the dealer from the customer and then resold to another customer and measuring bid-ask spread differentials between the two trades.

The authors found that, for inactive bonds, spreads generally were smaller, the ratio of the average dollar volume bonds sold relative to dollar volume bought was larger but average holding period was longer.

## Methodology

The study looked at high yield bond transactions in the secondary market<sup>30</sup>, constructing trading tests, and calculating spreads for bonds defined as active and inactive. They used a similar, but not precisely the same definition as TRACE for an “inactive bond”. The researchers examined spreads based on Reuters spread estimation for active and inactive bonds by transaction size prior to transparency/price dissemination; direct spreads (dealer round trip) prior to transparency/price dissemination; and regressions on direct spreads before and after transparency/dissemination.

There are at least two limits to this approach. First, the paper implies that liquidity is defined in terms of spread rather than trading volume, while, as previously noted, volume is a broadly used measure of liquidity.<sup>31</sup> Second, the authors are looking at the difference in spreads in a “three-way” round trip trade regardless of the length of time between the two legs of the trade - the purchase and sale of bond –which may have been substantial (although statistical findings are reported for different time intervals between and the buy and sell portions of the roundtrip). Market events thus could have affected the buy and sell price and thus the measured spread.

## Conclusions

The authors’ statistical analysis found that overall, larger transactions in inactive bonds did not have wider spreads than smaller transactions or transactions in active bonds but, on average, it took longer for offsetting transaction for large inactive bonds (but the offsetting transaction was larger). Based on the statistical analysis and find-

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<sup>30</sup> NASD also commissioned a study on new issues and those findings can also be discussed.

<sup>31</sup> The authors indicated that the trade volume measure was not used since the high-yield universe had already been classified as actively and inactively traded based on how often the bond is traded, a concept closely related to trade volume.

ings, the authors gave the below unproven explanations for inactive bonds having smaller spreads and higher sale ratios that, at minimum, are questionable.

1. Dealers want to get inactive bonds out of inventory, and thus offer better prices if the counterparty buys more inactive bonds
2. Dealers search more aggressively for buyers of inactive bonds—the same unsubstantiated rationale as in the BBB study cited above.

As noted in the discussion of the BBB study, such analysis does not make the case for dealers investing capital, holding in inventory and making markets for inactively traded high-yield bonds.