An Examination of Transparency in European Bond Markets

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ISBN 978-0-938367-48-2
October 2011

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Executive Summary

The purpose of the Markets in Financial Instruments Directive (MiFID), implemented in November 2007, was to increase competition and consumer protection in investment services and to improve market efficiency and transparency. The directive currently allows European Union member states to 'decide to apply the pre- and post-trade transparency requirements . . . to financial instruments other than shares'.[1] Only one major market (Italy) has mandated pre- and post-trade transparency for bonds traded on regulated markets or multilateral trading facilities and post-trade transparency for bonds traded over the counter (if such bonds are listed on an Italian regulated market).

This report examines the market microstructure of bond markets to determine whether mandating bond market transparency for pricing, trade size, and execution time is feasible and if so, desirable. One of our conclusions is that the structure of the bond market, and in particular the role dealers play as intermediaries, limits the ability of regulators to effectively apply pre-trade transparency requirements without the risk of such intermediaries leaving the market. Most bond market trades occur over the counter only after an investor has submitted a request for quote to multiple dealers. Because of their roles as principals and because their own trading profits are at stake, dealers would likely withdraw if forced to quote two-way markets on hundreds of thousands of bonds, particularly with the average trade size at several hundred thousand, if not millions, of euros.

We analyse Italy's experience with mandatory pre-trade and post-trade reporting. We also analyse 13 academic studies pertaining to bond market transparency that, overall, suggest greater post-trade transparency does not lead to lower dealer participation, reduced liquidity, wider bid–offer spreads, or limited market depth. In part, these findings also reflect changes resulting from the rise in electronic bond trading platforms, where an increasing proportion of over-the-counter fixed-income trades are executed. These platforms may eventually obviate the need for mandated pre-trade transparency, while also reducing search costs for traders and offering post-trade transparency.

We conclude that a gradually phased-in post-trade transparency requirement for bond transactions in the European Union would be a positive development for investors, provided that dealers are offered protection, such as delayed release of transaction information to offset the risks from larger trades.

[1]Recital 46 of MiFID (Directive 2004/39/EC).

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1 Introduction

On 21 April 2004, the European Parliament and European Council adopted the Markets in Financial Instruments Directive (MiFID). MiFID, which is the foundation of the European Commission's Financial Services Action Plan (FSAP), sets out a comprehensive regulatory regime covering investment services and financial markets in Europe. MiFID's objective is to foster a transparent, efficient, competitive, and integrated European financial market by providing a regulatory environment that offers investor protection and allows for the creation of new markets and trading platforms under a harmonized legal framework for both wholesale and retail financial markets. MiFID's reach extends to all investment firms, including brokers, broker–dealers, portfolio managers, and credit institutions. Broadly speaking, MiFID was designed to address four main concerns: investor protection, competition, market efficiency, and transparency.

MiFID's implementation was primarily designed to update cross-border investment guidelines that had been put forth under the 1993 Investment Services Directive (93/22/EEC),[2] given that until fairly recently, individual European Union (EU) member states held a fair degree of latitude to impose their own rules with regard to trading in financial markets. Under MiFID, which was implemented on 1 November 2007, firms authorised in the EU may operate under a single 'passport'. Therefore, a firm authorised under MiFID is able to use its MiFID passport to provide services in other EU member states without applying for permission to do so from multiple local regulators, thereby enabling investment firms to provide cross-border services with a single set of regulatory standards on the basis of authorisation in their home member state. MiFID has increased competition among exchanges, multilateral trading facilities, and investment firms, thus providing investors throughout the EU with an increased number of trading venues and a more comprehensive framework to ensure greater levels of investor protection.

MiFID was constructed under the Lamfalussy process, which encompasses a four-level legislative approach for the design, implementation, and enforcement of the legislation. Level 1, which lays out the framework principles, is generally referred to as the main MiFID directive (2004/39/EC) and was adopted by the European Council and the European Parliament in 2004.[3] Level 2, which provides for the framework's technical implementation, reflects measures adopted by the Commission following submission to the European Securities Committee (ESC)—a committee composed mainly of representatives from member state ministries of finance—and the European Parliament, as well as non-binding

[2] See http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31993L0022:en:HTML.
[3] See http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:145:0001:0044:EN:PDF.

advice from the Committee of European Securities Regulators (CESR)[4] following extensive public consultation. The implementing regulation (2006/1287/EC) and the implementing directive (2006/73/EC) require member states to transpose MiFID into national legislation by November 2007; however, directives can be adapted and updated over time. Level 3, which refers to strengthened co-operation and the convergence of regulatory practice among member states as drafted by CESR/ESMA, and Level 4, which addresses enforcement action for any failure to implement or inconsistent implementation, are ongoing initiatives.

As part of a continuing evaluation of MiFID's principles, and as mandated by Article 65 of MiFID (excerpted below), the Council of Ministers and the European Parliament asked the Commission to investigate whether and to what extent new requirements on pre- and post-trade transparency should be introduced at the EU level to the trading in financial instruments other than equities:

> . . . the Commission shall, on the basis of public consultation and in the light of discussions with competent authorities, report to the European Parliament and Council on the possible extension of the scope of the provisions of the Directive concerning pre- and post-trade transparency obligations to transactions in classes of financial instrument other than shares.

In turn, the Commission asked CESR to provide focused advice on factual and regulatory questions and solicited input from the European Securities Markets Expert Group (ESME) as well as the general public. As part of this process, extensions of transparency requirements were considered primarily for the following financial instruments:

- cash government bonds,
- cash investment-grade corporate bonds,
- cash high-yield corporate bonds,
- asset-backed securities, and
- credit default swaps, interest rate swaps, and bond futures.

In this report, we examine the debate surrounding pre-trade and post-trade transparency requirements with a specific focus on corporate bonds. We find that the benefits of post-trade transparency, in particular, would outweigh the costs of compliance for liquidity providers. As a basis for comparison, we examine the effects of TRACE (Trade Reporting and Compliance Engine)—the mandatory post-trade reporting system for over-the-counter secondary market transactions in U.S. fixed-income securities—with a focus on the empirical

[4] Note that as of 1 January 2011, CESR was replaced by ESMA—the European Securities and Markets Authority.

findings from academic literature. We also highlight the current state of transparency and liquidity in the Italian bond market, given that Italy is one of only a few EU member states to have exercised the option to extend trade transparency requirements to financial instruments other than shares.[5]

[5]Recital 46 of Directive 2004/39/EC states:

'A Member State may decide to apply the pre-and post-trade transparency requirements laid down in this Directive to financial instruments other than shares. In that case those requirements should apply to all investment firms for which that Member State is the home Member State for their operations within the territory of that Member State and those carried out cross-border through the freedom to provide services. They should also apply to the operations carried out within the territory of that Member State by the branches established in its territory of investment firms authorized in another Member State'. (See http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:145:0001:0044:EN:PDF.)

According to an internal (unpublished) review undertaken by CESR in 2010, other jurisdictions—in addition to Italy—have extended trade transparency requirements to other financial instruments in accordance with Recital 46 of MiFID. However, the type of financial instruments covered by the extension is most extensive in Italy and Sweden; in Germany, Denmark, Romania, and Slovakia, the extension is limited (e.g., only to depositary receipts).

Note also that according to the International Organization of Securities Commissions, in some of the markets covered by the Standing Committee on Secondary Markets (SC2), transparency arrangements for listed bonds also extend to the publication of post-trade information when the bonds are traded off-market. Some SC2 jurisdictions require that bond trades be reported to the market upon which the debt security is listed within a prescribed period of time, after which the trade information is then disseminated to the public in the same manner as if the trade had been executed on the exchange (Canada, Hong Kong, Italy, Mexico, Singapore, and Switzerland).

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2 Regulatory Framework: The MiFID Review

As of August 2011, MiFID's trade reporting requirements related only to shares. However, CESR has analysed the eventual extension of MiFID transparency requirements to non-equity financial instruments in a series of consultation papers and technical recommendations, some of which are highlighted in **Exhibit 1**. Note that CESR's initial response to the European Commission included a table detailing existing transparency requirements in place for listed bonds, which is shown in **Appendix I**.

Exhibit 1 CESR's Consultation Documents/Technical Advice Regarding MiFID Transparency Extensions to Non-Equity Markets

CESR Study/ Analysis	Date	Summary (Reference)
Ref. CESR/07-284b	Aug 2007	CESR did not find evidence of market failure which would warrant mandatory transparency for bond markets, although it noted that re-distribution of current transparency information could be useful to retail participants. (See www.esma.europa.eu/data/document/07_284b.pdf.)
Ref. CESR/09-348	Jul 2009	CESR re-assessed evidence of market failures post-crisis and concluded additional post-trade information would be beneficial.
Ref. CESR/10-510	May 2010	CESR explored possible ways of implementing post-trade transparency for corporate bonds as well as other securities, such as ABS (asset-backed securities), CDOs (collateralised debt obligations), and derivatives. (See www.cesr.eu/data/document/10_510.pdf.)
Ref. CESR/10-799	Jul 2010	CESR concluded that because of the largely over-the-counter nature of corporate bond markets and the lack of trading data to calibrate a post-trade transparency regime, calibration should be based on the average trading size of each market in question. A post-implementation review should follow one year after the new transparency obligations are introduced. (See www.cesr.eu/popup2.php?id=7003 pp. 49–74.)
Ref. CESR/10-851	Oct 2010	CESR advised that for corporate bond transactions with an upper threshold of €500,000 to €1 million, the price and volume of the transaction should be published as close to real time as possible. For trades above this size but below €5 million, price and volume should be published by the end of the trading day; for trades in excess of €5 million, only prices should be published. (See www.esma.europa.eu/popup2.php?id=7285.)

In turn, the European Commission published a public consultation on amendments to MiFID dated 8 December 2010,[6] where it proposed extending the transparency requirements to non-equity instruments, whether traded on regulated markets (RMs), multilateral trading

[6] See the Commission's 8 December 2010 Public Consultation, http://ec.europa.eu/internal_market/consultations/docs/2010/mifid/consultation_paper_en.pdf.

facilities (MTFs), organised trading facilities (OTFs), or on an over-the-counter (OTC) basis.[7] Specifically, the Commission proposed that the 'publication of post-trade transparency data [for non-equity instruments] would, as far as possible, follow the same channels as for equities' (p. 27). The consultation proposal also considered pre-trade transparency requirements for 'all trades in specific non-equity products, whether executed on regulated markets, MTFs, organised trading facilities or OTC' (p. 27), which would be 'achieved through the setting up of new obligations for investment firms' (p. 27) and trading venues. The Commission proposed applying these transparency requirements to all bonds and structured products with a prospectus or to those admitted to trading either on a regulated market or MTF, including derivatives eligible for central clearing.[8] **Exhibit 2** highlights the Commission's consultation proposal for non-equity market transparency, which largely follows MiFID's current transparency regulations for shares.

The Commission's consultation was open to the public until 2 February 2011; during the 56-day comment period, the reform proposals drew 366 full responses and more than 4,200 comments.[9] Responses were quite mixed and reflected a lack of consensus among regulatory bodies, trading platform operators, and other consortiums, as shown by a handful of the comments in **Exhibit 3**.

Exhibit 2 Pre-Trade and Post-Trade Transparency under MiFID: Non-Equities

Venue	Commission Proposal
Pre-Trade Transparency	
Organised trading facilities	Continuous real-time publication, potentially with the range and depth of binding commitments to buy/sell.
Investment firms executing trades OTC	No obligation to quote, but willingness to quote must result in public display of price (reflective of current market value) and volume binding below a certain size. Quoted prices could not significantly deviate from pre-trade information available for comparable instruments on RMs, MTFs, or organised trading facilities.
RMs and MTFs	Continuous real-time publication, potentially with the range and depth of binding commitments to buy/sell.
Systematic internalisers (SIs)	Unspecified.*
Post-Trade Transparency	
RMs, MTFs, SIs Investment firms acting OTC Organised trading facilities	Continuous real-time publication, predicated on a system of thresholds and delays, based on transaction size; calibrated to the class of financial instrument in question; potential flagging of trades that are OTC.

*Given the lack of registration by firms as SIs, SI requirements for transparency in non-equity markets were not specifically addressed.

[7] These terms are all defined in **Appendix II**.
[8] CESR's Technical Advice did not cover derivatives eligible for central clearing in its recommendation.
[9] All public comments from individuals, government authorities, and registered organisations were posted for viewing (see http://ec.europa.eu/internal_market/consultations/2010/mifid_en.htm).

Exhibit 3 Select Public Responses to the European Commission's Public Consultation on Amendments to MiFID

Responder	Comment
UK Financial Services Authority (FSA)/ Treasury	'The UK also supports the idea of mandating appropriately tailored pre-trade transparency requirements for the trading of non-equity instruments on Regulated Markets and MTFs. However, the UK is concerned about the ability of investment firms to provide OTC quotes in a range of non-equity products given the market risk and capital commitment that this would involve. In addition, the value of transparency information as a tool for price formation in relation to a customised non-equity product or an illiquid product is questionable. (p. 31) The 'feedback we have received from a broad cross section of market participants transacting non-equity products, including institutional investors, suggests that if transparency requirements are too onerous or their scope is too broad, liquidity may be negatively affected with the consequence of raising the cost of trading in these securities. . . . The value of pre- and post-trade transparency information as a tool for price formation in relation to a customised product, tailored to the needs of a particular participant, or in an illiquid product trading very infrequently, is unlikely to assist with price formation in a way that is fair to the end investor'. (p. 37) (See www.hm-treasury.gov.uk/d/uk_mifid_review_response090211.pdf.)
Eurosystem/ECB	'The Eurosystem supports the Commission's proposal to amend the MiFID framework directive to require pre- and post-trade transparency for all trades in specific non-equity products, whether executed on regulated markets by MTFs, by organised trading facilities, or by OTC. (p. 4) '. . . the ECB would welcome regulatory-driven trade transparency regimes since, in particular, post-trade transparency in Europe has mainly been left in the domain of self-regulation without sufficient results. Both pre- and post-trade transparency are equally important respectively to ensure and monitor best execution. Information always leads pricing. Hence, pre-trade transparency can be seen as a logical prerequisite for post-trade data. At the same time, including all bonds executed on different market places would avoid the risk of de-listing, which would have the adverse effect of reducing market transparency and also information on the bonds'. (p. 4) (See www.ecb.int/pub/pdf/other/ecpublicconsultationreviewmifideurosystemcontribution 201102en.pdf.)
Association for Financial Markets in Europe (AFME)	'As a general comment we believe that many of the proposed policy changes are disproportionate to the regulatory issues described and will therefore have an overall negative economic effect, as costs of compliance for the market as a whole exceed the benefit of the issue being addressed. (p. 3) In non-equities, 'when considering trading transparency, we are supportive of regimes that increase transparency for retail participants whilst protecting the requirements of the wholesale market. We would like to see much more detailed analysis of the non-equities markets in order to ensure that increased transparency requirements can meet policy objectives without inadvertently introducing new market risks. Furthermore, block trades or risk transfer transactions should be exempt from pre-trade transparency requirements and should be reported post-trade with appropriate delays that allow for proper risk management of positions'. (p. 5) (See http://afme.eu/WorkArea/DownloadAsset.aspx?id=5106.)
London Stock Exchange Group	'If pre-trade transparency requirements were applied to [bond markets], it is likely that participants would be less inclined to commit capital to them, leading to a deterioration of liquidity, in turn making the portfolio valuation of these products more difficult. Transparency should not be viewed as a guaranteed means to achieve liquidity and/or increase retail participation'. (p. 55) 'We would support the provision of pre- and post-trade data for both debt securities and derivatives, and that this requirement be applied equally across RMs, MTFs and OTFs. However, such a regime should be sufficiently tailored to reflect differences in asset classes, and between the wholesale and retail markets. In particular, applying a pre-trade transparency regime to the wholesale markets for bonds could make participants less inclined to commit capital to them. . . . We do not believe it would be practicable to apply a pre-trade transparency regime to OTC—this was recognised in CESR's technical advice to the Commission in October 2010'. (p. 55) (See www.londonstockexchange.com/about-the-exchange/regulatory/lseg-submission-to-ec-on-mifid02-02-11.pdf.)

3 Market Structure

Much has been written about the different market structures that characterize trading in equities and bonds, suggesting that any requirements to increase transparency in the latter should recognise key fundamental differences. These are discussed below and shown in Exhibit 4.

- **Market Size:** The number of debt securities is quite large when compared with equities. For example, there are 6,022 shares admitted to trading on regulated markets in the EU as of 14 April 2011,[10] whereas Xtrakter's CUPID database (the database owned by capital market participants through the International Capital Market Association, ICMA) contains information on more than 150,000 existing debt securities. Whilst a company may have one or two share classes (common and preferred equity), the same company may have hundreds of debt securities outstanding, which may range from senior to subordinated issuance, creating a debt market that is far less concentrated than the equity market given the number of securities traded.
- **Trading Frequency:** Unlike equities, most bonds trade infrequently, so there is rarely a constant source of demand enabling buyers and sellers to trade simultaneously. A study by Biais and Declerck (2007) of European corporate bonds found that from 2003 to 2005, euro-denominated bonds traded just an average of 4 times a day, whereas sterling bonds traded an average of 1.5 times a day. In contrast, for European equities, the number of times an individual equity name can trade is substantially larger. Between April 2011 and August 2011, the average stock on the London Stock Exchange (LSE) traded 450–650[11] times each day; the same figure for equities on Borsa Italiana was even higher.
- **Trading Size:** The average size of a bond trade tends to be substantially greater than for an equity trade. According to the LSE's Monthly Market Report, during March 2011, the average trade size in U.K. equities was €9,000; the average retail cash fixed-income trade was €840,000. Institutional fixed-income trades are even larger and typically range from €1 million to €2 million.
- **Order vs. Quote Driven:** Whereas equity markets are generally order driven and largely multilateral, bond markets are quote driven and largely bilateral, with the bulk of bonds typically traded off-market or OTC through a dealer. Buy-side bond transactions typically occur following a request for quote (RFQ), in which asset managers actively request a price quote from one or several sell-side firms. This practice stands in contrast to the interdealer market, however, where pricing is continually updated to provide streaming quotes visible to all wholesale participants.

[10] See http://mifiddatabase.esma.europa.eu/Index.aspx?sectionlinks_id=14&language=0&pageName=MiFIDLiquidSearh.

[11] See www.londonstockexchange.com/exchange/statistics/daily-trading/daily-trading.html. Figure calculated as the total number of trades in a day divided by the number of stocks traded that day.

- **Intermediation:** A market may be quote driven by a dealer (as with most bond markets) or order driven, via limit order books as on equity exchanges. Whereas participation in the equity market allows for a continuous two-way market, liquidity in the bond market is provided almost exclusively by dealers who operate as either a principal or agent. Dealer markets are organised around one or more designated market makers, who continuously stand ready to buy or sell. Dealers facilitate fixed-income trading by putting their own capital at risk and/or by matching orders, searching for an external buyer or seller (who may or may not be another dealer). In contrast, limit order markets rely on submissions by investors of price-contingent orders—that is, orders to buy (or sell) at any price at or below (or above) a specified 'limit' price. In markets without dealers, the highest limit price on an unexecuted buy order and the lowest limit price on an unexecuted sell order constitute the market quotations. Note, however, that opacity is not an inherent feature of dealer-oriented markets. Moreover, as discussed later in this report, many electronic bond platforms allow for limit order books.
- **Liquidity:** Liquidity of bond markets versus equity markets may depend on factors aside from trading systems and reporting regulations. A liquid market may be defined as one where it is possible for market participants to transact buy or sale transactions at any time (during opening hours) in any size, at no extra cost, without this transaction causing prices to move (see O'Hara 1995; Fleming 2001) or alternatively where two-way markets are made available to market participants in wholesale market size and where there is openness in determining asset fair value (see Mackintosh 1995). For bonds, the total size of an issue and the degree of institutional ownership are the predominant determinants of liquidity. Liquidity may be measured by the bid–offer spread, the depth of buy/sell orders amassed at various price levels, the number of market participants, the number of dealers quoting, and the frequency of quotations and transactions, among other metrics.
- **Trade Types:** One must recognise that the needs of information traders (those possessing potentially market-moving information) differ from the needs of liquidity traders (those seeking execution of large trading blocks); the greater the concentration of information traders versus liquidity-driven traders, the more likely a given market is to show increased price volatility. While such distinctions also exist in equity markets, there are many other platforms for liquidity traders in equities, including dark pools and other non-public networks.

Not surprisingly, given the dynamics of the bond market, the bulk of bond trading takes place in a largely non-transparent OTC capacity rather than on a formalised central exchange, as shown in **Tables 1** and **2**. In the next section, we review the theoretical merits and possible drawbacks of bringing more transparency to the bond market.

Exhibit 4 Differences in Secondary Market Trading

	Equities	Bonds
Investors	–Significant retail presence –Institutional	–Small retail presence –Institutional
Market structure	–Multilateral, order driven –Predominantly on-exchange	–Bilateral, quote-driven, RFQs –Off-exchange, OTC
Alternative platforms	–Dark pools and other non-public networks allow for alternative trading venues to mask the prices and sizes at which participants are willing to trade (examples include Instinet, Posit, Liquidnet, SmartPool, Chi-X Delta, and most dealers)	–Dark pools in bond markets are relatively non-existent
Intermediation	–Trades are typically matched via limit order books	–Dealers frequently put their own capital at risk to execute a trade
Average trading frequency	–Continuous –Many times per day	–Discontinuous –Few times per day for corporate bonds; trading frequency for government bonds is typically substantially larger
Average trade size	–Small –Hundreds or thousands of euros	–Large –Hundreds of thousands or millions of euros
Liquidity	–High and continuous	–Varies depending on size of the issue, rating, and so on –Concentrated mainly in the period immediately after the issue and afterward when specific information on the issuer or the issuance is disclosed to the market; furthermore, part of secondary market liquidity can be affected by the market for credit derivatives and repos
Price formation	–Exchange	–Competitive RFQs –Price embodies additional and different information from shares
Relationship to credit derivatives (CDS)	–Limited	–Directly correlated with credit derivatives

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Table 1 Market Shares of Trading Venues by Type of Financial Instrument

	Equities	Fixed Income	Derivatives
EU (MiFID)			
Regulated markets	49.0%	5.0%	20%
MTF	8.0	3.1	0
OTC including dark pools	41.0	89.2	80
SI (for equities only)	2.0	NA	NA
Other	0.0	2.7	
United States			
Exchanges	64.2%	<1%	20%
OTC (including ATS/dark pools)	35.8	>99	80

Notes: EU equities trading as of May 2009; fixed income as of December 2008. U.S. equities as of July 2009 in exchange-listed stocks; fixed income as of July 2009 (TRACE).

Source: Comparing European and U.S. Securities Regulations, Chapter 2, based on information from World Bank working paper.

Table 2 Top Venues of Execution for Fixed Income

	2008	Q1 2010	Q2 2010
OTC[a]	89.17%	85.67%	87.46%
Tradeweb Europe	2.13	3.19	3.91
MTS S.p.A.	1.60	1.12	1.17
ICAP electronic broking (Europe)	1.54	1.15	1.03
MTS BondVision	0.60	0.63	0.76
NYSE Euronext (Amsterdam)	0.54	0.28	0.26
London Stock Exchange	0.48	0.58	0.57

Note: Percentages based on transaction count as processed by Xtrakter, including OTC execution.

[a]OTC is included in the table; however, this is not a venue of execution but is a method of execution. Data based on Xtrakter's OTC trade matching and regulatory reporting system.

Source: Based on information from Xtrakter.

3.1. Arguments for and against Transparency

In this section, we evaluate the main arguments for and against greater trade transparency in the bond market. Consideration of additional transparency for this market should focus on the following questions:

1. Does transparency relate to pre-trade and/or post-trade transparency? Should indicative prices, executed trade prices, and volumes all be made public?

2. What types of distinctions are made for transactions occurring on-exchange versus off-exchange, if any? Does the transparency regime depend on the degree to which bonds are listed or unlisted?
3. Do transparency requirements differ depending on the market segment (retail versus wholesale) and transaction type (dealer to dealer versus dealer to institutional investor)?
4. Is information disseminated in real time or with a delay (i.e., end of day or next business day)? Do all pan-European investors have access during their respective business hours?
5. Are data aggregated (average daily trading price, total volume, day's high/low) or provided on a trade-by-trade basis?
6. How are data disseminated? Is it through a trading screen or via the internet? Is information made available to the public or to a set of professional investors? Is there a cost, or is information distributed via a subscription?

3.1.i. Possible Benefits of Transparency

Investor protection

- Transparency can alleviate information asymmetries, putting different types of investors (informed traders and liquidity seekers alike) on a more level playing field in relation to access to relevant information. Participation by a more heterogeneous investor base could follow if investors previously held back by uncertain transaction costs and high search and market costs were brought into the market, resulting in greater participation and increased trading volumes, which may lower bid–offer spreads.
- Clients can more easily verify receipt of best execution practices, not only by comparing prices received or paid on a given trade but also by monitoring the timeliness of execution and the degree to which trade execution impacted market prices via execution on any one given platform. The ease of such comparisons is that much more important now that the Concentration Rule[12]—mandating execution on a designated single platform—is no longer in force.
- Fund managers would be better equipped to revalue portfolios on a more timely basis.
- Regulators' ability to detect fraud, manipulation, unfair pricing, and other market abuses would likely be enhanced.

Market efficiency

- Transparency can lead to more efficient and robust price formation by ensuring that information and price signals are more rapidly dispersed and absorbed by the market.

[12] MiFID abolished the Concentration Rule that had been present under the 1993 Investment Services Directive, freeing member states from the requirement that investment firms route client orders through regulated markets. Previously, the Concentration Rule required orders given by investors (in countries including Italy) to be carried out on official markets—although all investors, whether private or institutional, were allowed to opt out of the concentration regime and have their transactions executed off-market.

- Transparency can foster more liquid markets by ensuring that market participants have comparable access to information about real market conditions, thereby encouraging greater participation.
- Transparency strengthens competition amongst market makers and dealers by encouraging them to post better prices in order to attract order flow. In turn, competition can lower transaction costs and bid–offer spreads.
- Liquidity that would otherwise be fragmented across trading platforms can be connected by requiring an integrated view of prices across multiple trading venues. Therefore, transparency helps consolidate an otherwise fragmented market.
- Technological innovations are more likely to develop in a competitive environment where there is greater visibility regarding pricing and execution, particularly given the growth of more centralised, multilateral electronic trading facilities.

3.1.ii. Possible Costs of Transparency

Dealer risk aversion

- Transparency at the dealer-to-investor level may create a 'winner's curse', making it costly for a dealer to hedge his or her position. In a B2C (business-to-customer or dealer-to-investor) market, a seller can request quotes on an electronic platform. Because a number of dealers submit quotes, only the highest-bidding dealer secures the bonds. Typically, the successful dealer then enters the B2B (business-to-business or interdealer) market to hedge the risk. The underbidding dealers, however, are aware of the winning dealer's need to hedge and can benefit by taking up contrarian positions in the interdealer market, thereby making it difficult for the successful bidder to offset the risk of the position. As a result, if dealers are forced to 'show their hand' to the market, an increase in market transparency may make dealers more cautious about serving as an intermediary.
- In the case of a block trading of securities, immediate publication of the relevant trade information may expose the dealer to an adverse market movement as other market participants try to exploit the dealer's change in position.
- To the extent that primary dealers—those broker/dealers who act as backstops for government bond auctions—are not adequately protected with regard to some degree of market opaqueness (especially relating to pre-trade transparency measures), liquidity provisions at government auctions could be hampered.

False investor assurance

- Requirements to quote both bids and offers on bonds may create artificial liquidity—liquidity that disappears when it is placed under pressure and, therefore, when it is needed most. Investors who might view tight bid–offer spreads as a transparent market may be surprised to find a market that is not deep, offering limited execution size.

Higher costs may be passed to buy-side/retail participants

- Compliance for market makers to publish pre-trade prices and post-trade executions entails a cost with respect to time, technology, and usage of other resources, including the cost of maintaining appropriate infrastructure. Such costs may not necessarily be wholly absorbed by dealers.

3.2. Italian Bond Market Microstructure

In an effort to determine whether greater transparency should be mandated in European bond markets, we turn our attention to Italy. Italy is currently one of only a few EU countries that has voluntarily exercised Recital 46 of MiFID, choosing to extend transparency measures to financial instruments other than shares. The Italian bond market is also the largest in Europe, and the third largest in the world after the United States and Japan. The specific regulations regarding transparency in the Italian market are detailed below in Section 3.2.i (Italian Transparency Framework). In general, Italy requires RMs, MTFs, and SIs to establish and maintain transparency regimes for financial instruments traded on systems operated by these trading venues. The trading venues are allowed to design their pre-trade transparency rules, taking into account the microstructure, the nature of the financial instrument, the amount traded, and the type of market. Investment firms are also required to disclose post-trade transparency on transactions concluded outside regulated markets, MTFs, and SIs on financial instruments other than shares admitted to trading on Italian regulated markets. Investment firms in Italy must make public the information concerning the date and time of the transaction, the details of the financial instrument involved, and the price and quantity of the transaction concluded by the end of the working day following conclusion of the transaction.

Italy's decision to require bond market transparency is a natural extension of the country's widespread acceptance of electronic trading. As detailed later, Italy has a long history with electronic trading in government bonds via the MTS system, where pre-trade and post-trade information is available to market participants. The lack of adverse effects observed in electronic government bond trading (including the transparency that electronic trading offers) was likely one of the main reasons behind Italy's decision to extend Recital 46, even as most corporate bonds—unlike government bonds—trade OTC rather than via an electronic platform. In general, greater post-trade transparency is most beneficial to retail and smaller institutions; as such, it is not surprising that Italy, with its sizable retail presence and participation in Italian bond markets, would be supportive of transparency measures. According to the Centre for Economic Policy Research (CEPR), direct holdings of fixed-income securities by households are as high as 20 percent of total financial holdings in Italy (or even higher), between 10 percent and 15 percent in Germany, and typically less than 5 percent in other countries, with the majority of investments occurring through investment funds.[13] In the following, we provide further information on the Italian government and corporate bond markets as well as Italy's transparency requirements, providing greater detail as to how electronic trading—in Italy and elsewhere—is changing the degree of transparency provided to institutional and retail investors.

[13]See Biais, Declerck, Dow, Portes, and von Thadden (2006).

3.2.i. Italian Transparency Framework

Although wholesale (interdealer) trading of Italian government bonds has its own set of requirements (addressed in Section 3.2.ii), for other bonds that are admitted to trading on an Italian regulated market and trade via an exchange, MTF, or SI, the market operator is left to define the specifics of the pre- or post-trade transparency requirements applicable to its system. For corporate bonds that trade on either a regulated market or on an MTF, management companies and MTF managers 'shall establish and maintain their own adequate rules on pre- and post-trading transparency with regard to financial instruments other than shares admitted to trading on the systems managed, taking into account the structural characteristics of the market, the type of financial instrument traded, the size of the transactions and type of operators, and with particular regard to the market share of retail investors'. Similarly, for corporates which are transacted via an SI, the SI 'shall establish and maintain transparency rules in reference to said financial instruments, also differentiated according to the structural characteristics of the market, the type of financial instrument traded, the size of the transactions and the type of operator, and with particular regard to the market share of retail investors'.

For example, some of the transparency provisions required by ExtraMOT (an MTF, discussed in Section 3.2.iii) include the provision, in the pre-auction phase,[14] for market participants to have access to the following information for each financial instrument, updated in real time:

a. the theoretical opening price and related tradable quantity,
b. the prices and quantities for at least the five best buy and sell orders, and
c. the aggregate buy and sell quantities for at least the five best prices.

Similarly, during the continuous-trading phase, the public shall have access to real-time updates of

a. the prices and quantities of at least the five best buy and sell orders,
b. the aggregate buy and sell quantities and orders for at least the five best prices,
c. the price of the last contract concluded, the date and time of execution, the quantity traded, and the identification code of the financial instrument, and
d. the cumulative quantity and value traded.

Most of the MTFs and RMs make aggregated pre-trade and post-trade transparency information available on their websites.

Dealers in securities that are admitted to trading on an Italian regulated market and that have been transacted off-exchange (or via OTC channels) are not exempt from post-trade transparency reporting. OTC trades for bonds admitted to trading on an Italian regulated

[14] In the ExtraMOT market, the pre-auction phase refers to the period when contracts are concluded at a theoretical price which maximizes the quantity traded; in contrast, during continuous trading, trades are concluded via the automatic matching of orders placed according to a price/time criterion.

market are required to be reported and made public 'under reasonable commercial terms and in a manner that is easily accessible' as long as one of the parties to the trade is an authorised person, which includes investment firms. Italian securities regulation requires that the date and time of the OTC transaction, the instrument identification details, and the price, together with an indication as to whether the transaction exceeds a €500,000 threshold (in which case, the trade is reported as 'greater than €500,000'), be published no less than one day following the trade execution.[15] OTC trades of bonds that have not been admitted to trading on an Italian regulated market have no post-trade transparency provisions.

Note that post-trade information is considered published or available to the public if it is accessible to investors through one of the following channels: (1) the structures of a regulated market or an MTF; (2) third-party structures; or (3) one's own device.[16] CONSOB (Commissione Nazionale per le Società e la Borsa) publishes a list of eligible reporting channels on its website and shows 98 eligible reporting venues.[17] However, only a few reporting channels are used by more than one subject, suggesting that only a handful of sites disseminate OTC trade information. For example, Borsa Italiana provides Post Trade Transparency Service (PTTS), through which non-members and members can report OTC trades; according to CONSOB's website, 83 entities are authorised to use this service; only one other reporting channel has more users (Iccrea Banca S.p.A.). An investment firm can send its trade to PTTS from 8 a.m. to 8 p.m.; PTTS then distributes the information through Borsa Italiana's information services to all members of Borsa Italiana's markets, as well as to major information vendors.

In summary, although RMs and MTFs may establish their own pre-trade and post-trade transparency requirements, the post-trade reporting of OTC trades (provided that the security is admitted to a regulated market) is explicit and must include date, time, security identification, price, and an indication of size.

3.2.ii. Italian Government Bond Market

Italy's government bond market differs from other developed country government bond markets given the responsibilities and rewards it assigns to its specialists. These specialists, like primary dealers elsewhere, are required to participate in government debt auctions; however, specialists' purchases at auctions as well as the depth of their support on secondary markets are quantitatively assessed across a host of factors, resulting in an end-of-year score or ranking. It is this ranking that forms the basis of select privileges conferred by the Treasury, including the Treasury's selection of lead managers for syndicated issuance[18] (particularly

[15] See CONSOB market regulation 16191, www.consob.it/mainen/documenti/english/laws/reg16191e.htm.
[16] See www.borsaitaliana.it/speciali/mifid/brochurebitsystemsfinalen.en.pdf.
[17] See www.consob.it/main/mercati/regolamentati/elenco_canali_pre_post_negoziazione.htm (note that the page is in Italian).
[18] Italian government issuance not denominated in euros is typically sold by a select selling team of dealers that is chosen by the Treasury.

international issues) and counterparties for bilateral buy-back transactions and exchanges. Moreover, the Treasury grants specialists exclusive access to reopenings.[19] Up until recently, specialists' secondary market volumes were counted based on the trading conducted on just one platform—MTS.

Mercato Telematico dei Titoli di Stato, or MTS, was founded in 1988 jointly by the Bank of Italy and the Italian Treasury as part of a public initiative to launch a screen-based marketplace, reflecting the need to sell an increasing volume of Italian domestic debt and to strengthen the secondary market for Italian government bonds. The creation of MTS as the first European electronic market for government bonds coincided with the move toward a more market-oriented approach, whereby the Italian Treasury pre-announced its auction calendar in advance of regularly scheduled debt auctions. Not only did the electronic system facilitate greater liquidity of bonds through a network that enabled transactions to be conducted more easily, but the clearer picture of market conditions—through continuous on-screen posting of bid and offer prices—also provided the Treasury a clearer picture of demand. Given discretion with regard to the size of new debt issues, the Italian Treasury could issue a greater amount of debt when it observed strong demand, preventing its borrowing costs from escalating when investor appetite for additional issuance was perceived to be weak.

In order to improve market depth and trading activity, MTS was reformed in 1994, which resulted in the creation of the current MTS system. MTS was privatised in 1997 (MTS S.p.A.) and was followed by the creation of EuroMTS in 1999 and by several MTS domestic markets (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Netherlands, Portugal, and Spain) adopting the same market model created in Italy. Whereas the MTS domestic markets allow for trading of government bonds and bills of a specific sovereign issuer, EuroMTS provides for trading of benchmark government bonds of all sovereign issuers as well as high-quality, non-government bonds covered by mortgages (covered bonds) or public state loans. The MTS platform is available only to dealers,[20] and importantly, only live, executable prices are shown, with best bid–offer quotes, market depth, and last traded prices displayed—all complete with related volumes. Quotes are collected in a book according to price and side of the market (whether buyer or seller). For each product, orders are electronically matched by price and quantity with respect to time of arrival. Market makers may show both the quantity bid/asked as well as the maximum quantity they are willing to trade, and the quotes must be displayed for all products assigned for at least five hours per day. Trades are anonymous when counterparties are members of a central counterparty clearing house; otherwise, they are name-give-up.

MTS Italy, as a regulated exchange, is supervised by the Italian Ministry of Economy and Finance, the Bank of Italy, and CONSOB. Currently, MTS is largely owned by Borsa Italiana, which is itself owned by London Stock Exchange Group. MTS disseminates a daily

[19] A reopening operation is when the same bond (identical ISIN/CUSIP) is issued on more than one occasion to increase its total volume outstanding, thereby likely adding to the issue's liquidity.
[20] Although the MTS system is exclusively for interdealer trading, MTS has a dealer-to-client platform known as BondVision, which allows institutional investors direct access to market makers.

bulletin that is free and available to the public, in which the day's minimum, maximum, average, and last traded prices are made available in conjunction with the day's total volume traded.[21] Through MTS Data, MTS disseminates a variety of products both directly and via third-party vendors, such as Thomson Reuters and Bloomberg, whose display is shown in **Figure 1**. Available to participants and non-participants of the MTS platform, MTS Data includes benchmark real-time pricing information that provides pre-trade transparency by distributing executable prices and sizes and post-trade transparency with trade information disseminated in real time with volumes. In addition, MTS Data includes MTS Time Series Data (high-frequency historical trade and quote data), MTS Reference Prices (open and close), MTS Reference Data, and MTS Snap-Shot Data. All data are sourced directly and exclusively from the MTS interdealer market.

Figure 1 Bloomberg-Displayed Real-Time Pricing of MTS Information

Source: Bloomberg.

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Previously, the Italian debt management office had designated MTS Italy as the single platform on which primary dealer rankings were counted. However, on 1 March 2011, the Ministry of Economy and Finance passed Decree No. 853355, which regulates the criteria by which the ministry amends the list of regulated markets and MTFs eligible to evaluate activity carried out by specialists. Whilst each specialist still needs to purchase at least 3 percent of total annual issuance at auction (and is awarded extra points toward its ranking for purchases up to 6 percent) and must contribute toward the provision of satisfactory secondary market volume via the continuity and depth of its quotations, specialists are no longer limited in showing the extent of their participation in the government market based on volume traded on MTS alone. Nonetheless, given the platform's history, dealers' usage of the MTS system

[21] See www.mtsdata.com/content/data/public/mts/bulletin/.

remains entrenched. As a result, the differences in how government debt is placed in Italy versus elsewhere—including the limitations on auction participants[22] and the continuous quotations specialists provide in the secondary market to ensure a good ranking—make comparisons of liquidity and transparency between the Italian market and other markets somewhat difficult, particularly because turnover in Italian markets is relatively high[23] and bid–offer spreads are relatively tight.[24]

3.2.iii. Italian Corporate Bond Market

Secondary corporate bond trading in Italy, as elsewhere, takes place primarily through the OTC market. Most trades are conducted on closed, proprietary bond trading systems or via telephone. Typically, an investor will place a request for a quote (either electronically or on the telephone) with a single dealer that indicates which side of the market he or she is on (buyer or seller) and the trade size. Such requests can be (1) an indication only, that is, not a firm commitment to trade at the stated price but only an indication to give the investor a sense of where the market might be; or (2) a live bid or offer, that is, a commitment to trade, with the quote binding perhaps only for a few seconds. An investor may also ask for a two-way market (choosing not to reveal whether he or she is a buyer or seller); in this case, the dealer is likely to provide a quote with a higher offer price and a lower bid price than would otherwise be the case to compensate the dealer for the inventory risk associated with having to buy or sell a bond that is not in line with the dealer's desired position. If an investor and dealer agree on a price and the trade is executed, for a buy order, the dealer may sell a bond to the investor out of the dealer's inventory or may buy the bond in a separate transaction via the interdealer market (for which bids, offers, and trade size are typically displayed electronically amongst dealers) before selling to the client. Similarly, for a sell order, a dealer who buys a bond from the client that is not in line with the dealer's desired position may offload this bond by selling it in the interdealer market. Note that the investor may have limited knowledge as to whether a dealer's quote is reasonable and/or consistent with a similar trade that has occurred just moments before, unless the investor has transacted on an electronic platform.

[22]Retail investors in many countries are frequently able to participate in government bond auctions directly without the need to transact through a specialist or primary dealer. In contrast, Italy allows only authorised dealers and financial intermediaries, such as banks and investment firms, to participate in auctions. For example, during the first four months of 2007, more than 95 percent of the total amount issued at auction was subscribed by the specialists. (See www.publicdebtnet.org/export/sites/PDM/public/MoreAboutUs/Study/d-hungary/5_Monitoring_and_evaluating.pdf.)

[23]Monthly turnover of U.S. Treasuries is significantly higher than the turnover in Italian benchmarks, which themselves show higher turnover than their European counterparts. A paper authored by Avinash Persaud, 'Improving Efficiency in the European Government Bond Market', showed that average daily electronic market turnover in Europe (via MTS and EuroMTS) and the United States (via eSpeed and BrokerTec) in March 2006 was 138.9 for the United States, 10.7 for Italy, and 1.2 for France and Germany, where turnover was calculated as volume traded in millions of euros divided by the outstanding amount of bonds in millions of euros, expressed as a percentage. One theory is that turnover may be positively related to the retail presence in the market.

[24]In general, bid–ask spreads on Italian government bonds are narrow; a study of government spreads across Italy, Belgium, France, and Germany found Italy's spreads to be the tightest, even holding both maturity and trading size constant (Cheung, Rindi, and de Jong 2005). This effect persisted even with average trade size for Italian bonds being smaller, given the presence of 140 participants on the local Italian interdealer electronic market during the study (January 2001–May 2002) but only 38 market makers. (The comparable figures for Germany, for example, included 39 market makers but only 60 participants.) The large number of participants relative to the number of market makers did not appear to hamper market liquidity and may have similar implications for corporate bonds, despite concerns that more fragmented markets may be less liquid.

Much of Italy's post-trade transparency in the corporate bond market stems from its earlier experiences, noted above, in electronic government bond trading. Outside of OTC transactions, there are nine RMs in Italy, eight MTFs, and only one SI. Of these, eight relate to bonds, as shown in **Exhibit 5**; an overview of the platforms regulated in Italy is detailed in the section below.

Exhibit 5 Italian Markets in Debt Securities

Italian Regulated Markets

Borsa Italiana S.p.A. (market management company)
MOTX—electronic bond market (comprises DomesticMOT and EuroMOT)

MTS S.p.A. (market management company)
MTSM—MTS government market
MTSC—MTS corporate market (ABS, quasi-sovereigns)
BOND—BondVision market (electronic bond trading for institutional investors)

Italian MTFs (all regulated by CONSOB)

ETLX	EuroTLX
HMTF	Hi-MTF (and its order-driven counterpart)
SSOB	BondVision corporate
XMOT	ExtraMOT

Source: Based on information from http://mifiddatabase.cesr.eu/.

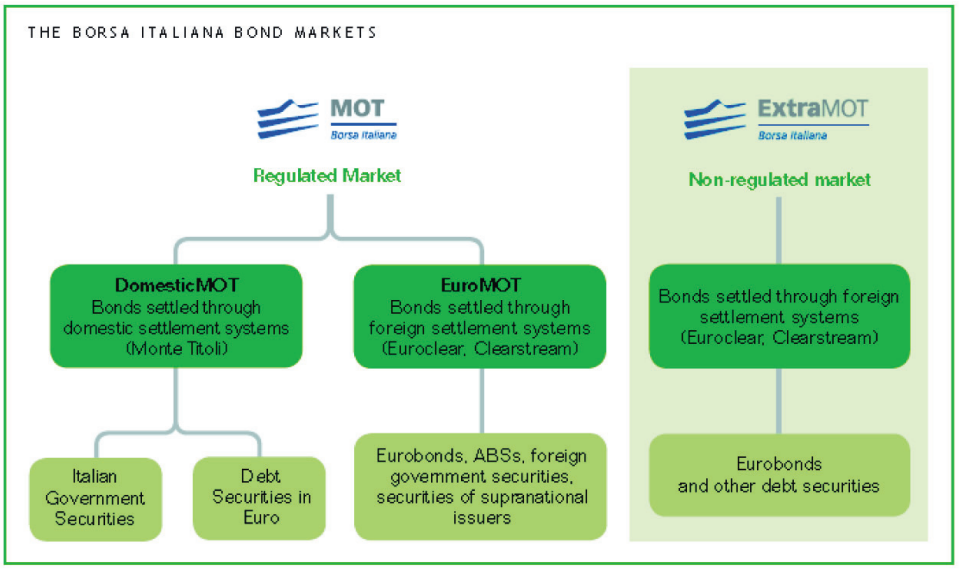
Borsa Italiana oversees three electronic platforms that cover European corporate bond trading:

- **DomesticMOT**, a regulated market that was created in 1994 and allows for trading of euro-denominated securities that clear through the domestic settlement system, Monte Titoli.
- **EuroMOT**, an alternative regulated market for bonds (including corporates) that settle through a foreign settlement system, such as Euroclear or Clearstream.
- **ExtraMOT**, which was created in 2009 and is similar to EuroMOT but is registered as an MTF, as shown in **Figure 2**.

Volume metrics from the MOT platform, for which aggregated details are provided free to the public on a monthly basis (see **Table 3** for an example), suggest that a reasonable degree of trading occurs in an organised marketplace, rather than OTC. However, the volume of trading in corporates on MOT is well behind that of Italian governments. Even so, dealers are unlikely to favour one trading platform over another. Given the post-trade transparency requirement for listed corporate bonds that have been traded OTC, there is less scope to prefer trading off-exchange versus on an MTF if the transparency reporting is similar, as later sections in this report suggest.

BondVision is the institutional multi-dealer-to-client electronic platform developed by MTS in 2001 and operates as a regulated market. BondVision allows for the trading of more than 2,000 multi-currency European governments and covered bonds as well as supranationals (but

Figure 2 Structure of Borsa Italiana's Bond Platforms



Source: Borsa Italiana (www.borsaitaliana.it/obbligazioni/obbligazioni/brochuremercatimoteextramot.en.pdf).

not corporates) from 29 market makers, with average daily volume of €2.5 billion and an average ticket size of €5 million.[25] No access fees or commissions are paid by institutional investors. Pre-trade transparency is offered via (1) the BEST page (displayed in **Figure 3**), which provides indicative pricing, (2) executable prices posted on single-dealer pages, and (3) benchmark prices available directly from the interdealer MTS platform (versus other platforms' calculated or derived prices), which are displayed as firm prices with market depths and volumes. In addition, single-dealer pages provide access to click-to-trade orders and allow clients to submit RFQs. The Italian Ministry of Economy and Finance regulates the government bond trading area, and CONSOB regulates trading in supranationals and covered bonds.

EuroTLX is the only fixed-income platform targeted to non-professional investors that is registered as an MTF in Italy. Liquidity is guaranteed by a mechanism of competitive and continuous auction and by the presence of at least 1 liquidity provider (from among 6 market makers or 12 specialists) during trading hours for each financial instrument. Liquidity providers must quote a two-way market on a limit price basis, whereas intermediaries may submit limit or market orders. Orders and quotes are ordered by price and time priority. EuroTLX offers a high level of price transparency, with pre-trade prices displayed as firm quotes and post-trade prices displayed following a 20-minute delay. Vendors may pay a monthly subscription fee to distribute real-time data, with end-of-day data available free of charge.

[25] See www.mtsmarkets.com/Products/~/media/MTS/Brochures/English%20brochure%20July.ashx.

Table 3 MOT Trading Statistics, May 2011

	Listed Bond					Trading					
	Dec 2010	Apr 2011		May 2011		Apr 2011		May 2011		Jan–May 2011	
	Listed End of Month	Listed End of Month	Newly Listed Early Jan 2011	Listed End of Month	Newly Listed Early Jan 2011	Trades Number	Turnover (€ millions)	Trades Number	Turnover (€ millions)	Trades Number	Turnover (€ millions)
Market segments											
Italian government bonds	98	101	15	101	17	174,878	11,598.9	211,911	14,085.7	1,114,138	69,736.7
Bonds	355	369	25	373	34	68,990	1,051.0	83,276	1,261.4	375,178	5,575.5
Eurobonds and ABSs	270	301	44	313	59	15,118	441.0	16,903	481.0	80,893	2,418.4
Total	723	771	84	787	118	258,986	13,090.9	312,090	15,828.1	1,570,209	77,730.6
Issuers											
Italian government bonds	98	101	15	101	17	174,678	11,598.9	211,911	14,085.7	1,114,138	69,736.7
Eurobonds Republic of Italy	17	16	—	16	—	1,486	26.9	1,586	35.7	8,337	167.8
Foreign public debt	149	160	16	163	20	7,248	173.0	7,011	164.6	38,094	1,030.7
Supranational entities	124	143	24	147	29	8,855	239.1	10,253	263.6	48,443	1,239.1
Banks	319	336	26	346	43	58,859	922.3	70,136	1,109.3	302,623	4,805.4
Corporate	14	14	1	13	1	9,648	130.5	11,189	149.2	58,491	749.1
ABSs	2	1	—	1	—	12	0.2	4	0.1	83	1.7
Total	723	771	84	787	110	258,986	13,090.9	312,090	15,828.1	1,570,209	77,730.6

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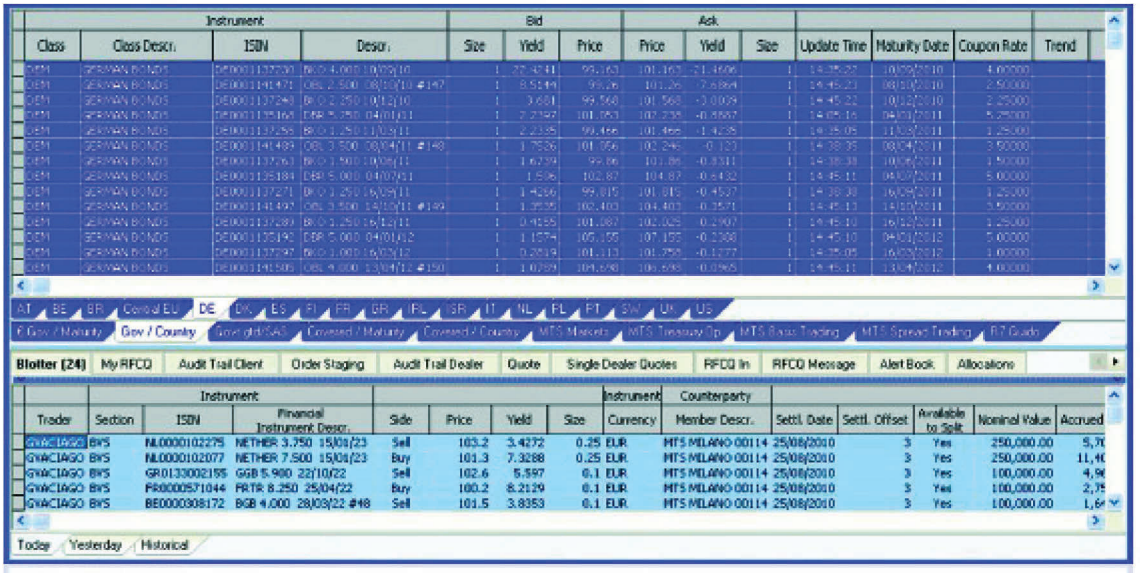
Figure 3 Snapshot of BondVision BEST Screen



Source: BondVision website.

Hi-MTF is an Italian-regulated MTF that was established by five Italian institutions: Centrosim, Istituto Centrale delle Banche Popolari Italiane, Iccrea Banca, Banca Aletti & C. (Gruppo Banco Popolare), and Banca Sella Holding. Hi-MTF allows for the trading of Italian government bonds, corporate bonds, and bank debt through two platforms: the Hi-MTF market, a quote-driven market with continuous trading, and the Hi-MTF order-driven market. In the quote-driven segment, in which Centrosim, Banca Aletti, Iccrea Banca, and Banca Sella Holding operate as market makers, market makers are required to provide prices in compliance with bid–ask spreads set by Hi-MTF's regulatory body. The order-driven segment operates via a daily auction mechanism and lists approximately 450 bank bonds widely held by retail investors. The members of the Hi-MTF order-driven market perform the roles typically played by institutional brokers and place retail customer orders on the market, creating a spontaneous order book.

4 Experience of the United States: The TRACE System

Given the differences between equity and bond markets as discussed earlier, there has been a certain amount of resistance from liquidity providers to provide transparency for fixed-income securities; even so, the level of pushback would likely have been greater were it not for the fact that the United States has had a successful post-trade transparency system in place since 2002.

On 1 July 2002, the National Association of Securities Dealers (NASD)[26] introduced TRACE (Trade Reporting and Compliance Engine) in an effort to increase post-trade price transparency in the U.S. corporate debt market.[27] The system captures and disseminates consolidated information, such as real-time pricing and trade volume, on transactions in publicly traded TRACE-eligible securities representing all OTC market activity in these bonds, including intra-day transaction data and aggregate end-of-day statistics (most active bonds, total volume, advances and declines, and new highs and lows). TRACE was implemented in several phases so that NASD would have the opportunity to study the impact of transparency on liquidity in the U.S. corporate bond market. Over time, the period in which firms had to report transactions was gradually reduced. On TRACE's launch in 2002, that reporting window was 75 minutes, which was lowered to 45 minutes on 1 October 2003, to 30 minutes on 1 October 2004, and 15 minutes on 1 July 2005. The amount of transactions reported to the public has been increased over time. During Phase I, public transaction information was disseminated immediately upon receipt for approximately 520 bonds, comprising larger and generally higher-credit-quality issues, investment-grade debt with initial issue sizes of $1 billion or greater, as well as 50 high-yield securities that had been disseminated under the now disbanded Fixed Income Pricing System (FIPS). Phase II, fully effective on 14 April 2003, expanded public dissemination to include transactions in smaller TRACE-eligible securities, including investment-grade issues with at least $100 million in par value rated A3/A– or higher, a group of 120 investment-grade securities rated Baa/BBB, and 50 high-yield bonds. As Phase II was implemented, the number of disseminated bonds increased to approximately 4,650 bonds. In Phase III, fully effective on 7 February 2005, transaction information on approximately 99 percent of all public transactions and 95 percent of par value

[26] In 2006, the NASD merged with the self-regulatory enforcement arm of the New York Stock Exchange to form the Financial Industry Regulatory Authority, or FINRA.

[27] As early as 1995, prior to the implementation of TRACE, the Municipal Securities Rulemaking Board (MSRB) offered an interdealer trade reporting system, which has since been expanded. As of October 2000, the MSRB has offered the Comprehensive Report, which lists all municipal securities transactions, regardless of the frequency of trading. Although initially the Comprehensive Report was released with a one-month lag, the delay has been shortened in several steps; currently, the Real-time Transaction Reporting System (RTRS) disseminates most municipal securities transactions effected by brokers and dealers within 15 minutes of trade execution, with data available through the free EMMA (Electronic Municipal Market Access) website at http://emma.msrb.org/ (and more comprehensive data feeds available through paid subscription).

in the TRACE-eligible securities market was disseminated upon receipt, although transactions of more than $1 million in certain infrequently traded high-yield securities were subject to dissemination delays, as were certain transactions immediately following the offering of TRACE-eligible securities rated BBB or below. However, since 9 January 2006, all transactions in public TRACE-eligible securities must be reported to FINRA within a 15-minute window, at which point, they are immediately disseminated on the TRACE system. TRACE operates from 8:00 a.m. to 6:30 p.m. U.S. Eastern Time. Trade executions between 12:00 a.m. and 7:59:59 a.m. are disseminated upon receipt and included in the calculation of daily high, low, and last sale prices. Trade executions between 6:30 p.m. and 11:59:59 p.m. are disseminated upon receipt beginning at 8:00 a.m. of the next trading day.

Importantly, TRACE data are available through all major market data vendors and on certain public websites and are available to retail investors through FINRA's website. Aggregate market statistics are published on the internet at the end of each business day, posted by approximately 7:00 p.m. Eastern Time. The data provide an end-of-day recap of bond market activity, including the number of securities and total par amount traded as well as advances, declines, and 52-week highs and lows. In addition, the 10 most active investment-grade, high-yield, and convertible bonds for the day are listed. More detailed TRACE downloads are also available free of charge to the public, including a list of all eligible securities traded on a given day, shown with time of execution.[28]

While initially the eligible reporting universe consisted of secondary market trading in investment-grade, high-yield, and convertible corporate debt, the requirements were expanded on 1 March 2010 to include primary and secondary market transactions in new issues from federal government agencies, government corporations, and government sponsored enterprises (GSEs) as well as primary transactions in corporates. As of 16 May 2011, FINRA requires the reporting of all asset- and mortgage-backed securities transactions to TRACE, although for the first six months, as a pilot test, the trade information will not be disseminated until the transaction data are thoroughly analysed to determine whether publication is appropriate. As a result, should the asset- and mortgage-backed transaction information be released in the future, post-trade data will be published for all publicly traded debt securities except money market instruments and U.S. Treasury securities.

4.1. Benefits of TRACE

Not surprisingly, FINRA cites TRACE as playing an important role in aiding OTC market transparency, not only by enabling investors to have insight into the range of prices at which they are likely to be able to execute their next trades but also by providing investors with the ability to monitor the quality of price execution received on prior trades. Importantly, granular transaction data enhance regulators' ability to better detect fraud, manipulation, unfair pricing, and other misconduct that violates securities laws, providing crucial information for oversight and surveillance for the protection of investors.

[28] See www.finra.org/marketdata.

Note that contrary to what many expected, the introduction of TRACE did not result in greater dealer concentration (i.e., fewer dealers willing to make markets). In 2010, the top 10 TRACE broker/dealers accounted for just 36 percent of trades and 51 percent of par value traded. In contrast, equity market concentration is typically much greater; in 2007, the top 10 NASDAQ market makers represented 73 percent of shares traded.[29] Moreover, TRACE has proven to be an important tool for the retail community, which is much more active than was commonly thought. As shown in **Table 4**, the five most active firms captured less than 26 percent of all retail-sized transactions in 2010, down from 32.2 percent in 2002 (where retail-sized trades are typically defined as those trades with trade amounts less than $100,000), suggesting that investors rely on the availability of multiple outlets for transacting in smaller denominations. In 2010, there were an average of 21,218 investment-grade corporate bonds—each less than $100,000 in par value—traded each day, equal to 75 percent of all trades, up from 13,533 (73 percent) in 2002, even though these retail-sized transactions account for a small amount of the par value traded.[30]

In general, little evidence exists that the dealer community has stepped away from providing liquidity to the market as a result of TRACE. In 2010, for example, the top 50 publicly traded corporate investment-grade issues traded more than 762,000 times, with dealer quotes on each issue provided by as many as 443 dealers over the year (the minimum number of dealers

Table 4 Percentage of Corporate Activity Captured by the Most Active Firms Reporting Trades Less than $100,000 in Par Value to TRACE

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Unique firms reporting	1,371	1,577	1,562	1,590	1,570	1,519	1,507	1,575	1,535
Average reporting firms per day	409	438	422	433	393	367	393	489	490
% of <$100,000 S1 trade activity captured by									
Most active 5 firms	32.2%	30.9%	29.0%	25.1%	25.1%	28.4%	30.5%	28.3%	25.8%
Most active 10 firms	49.4	46.0	45.6	40.7	42.4	47.6	51.3	46.1	43.4
Most active 25 firms	69.0	64.2	65.3	63.6	67.2	70.0	72.8	68.6	67.1
Most active 50 firms	80.3	77.5	77.1	77.1	79.1	81.2	83.9	82.0	80.3
% of <$100,000 S1 par value activity captured by									
Most active 5 firms	28.5%	28.0%	26.1%	22.7%	22.2%	25.5%	27.4%	25.8%	23.0%
Most active 10 firms	43.5	41.3	39.8	36.9	38.2	42.3	46.2	41.1	39.2
Most active 25 firms	63.3	59.3	60.0	58.5	62.5	65.4	68.1	64.2	63.1
Most active 50 firms	76.2	73.7	73.7	73.6	75.7	77.9	80.5	78.5	76.9

Note: Excludes equity CUSIPs.

Source: Based on information from FINRA Fact Book, Years 2005–2010 (www.finra.org/Industry/Compliance/MarketTransparency/TRACE/FactBook/).

[29] See www.world-exchanges.org/news-views/views/expansion-trace-us-fixed-income-otc-market.

[30] S1, or secondary market investment-grade trades, excluding convertible bonds and 144As. See Table C19, 2010 Transaction Information, 2010 TRACE FactBook (www.finra.org); 2005 FactBook (www.finra.org/web/groups/industry/@ip/@comp/@mt/documents/appsupportdocs/p017618.pdf), p. 58.

quoting any one of these bonds was still significant at 190).[31] In 2010, the average daily par value of investment-grade bonds traded (excluding interdealer trades and excluding convertibles and equity CUSIPs) was almost $9.5 billion, with more than 16,000 trades on average per day.[32] In 2010, 1,633 unique firms reported trades to TRACE, up from 1,470 in 2002, despite a fair degree of market consolidation via merger and acquisition activity.[33] In terms of activity, an average of approximately 500 firms reported a trade each day (489 in 2002, 588 in 2010).[34] The volume of trading is also evident in the breadth of securities trading: approximately 20 percent of the 30,000 TRACE-eligible bonds trade at least once each day, and almost 50 percent trade at least once a month.[35]

4.2. Summary of Academic Literature

A summary of independent academic findings—both on the impact of TRACE and on the advantages and disadvantages imposed by greater transparency in other markets—is listed in **Exhibit 6**. The symbols listed next to the paper title suggest overall findings; '+' implies positive benefits from TRACE and/or greater market transparency and liquidity, and '–' and '↔' suggest negative and neutral findings, respectively.

Of the 13 studies reviewed here, 8 indicate that additional transparency is somewhat beneficial, with another 2 suggesting that greater transparency is neutral in its impact.

Exhibit 6 Key Academic Studies

Study/Description	Impact
1999: Does Market Transparency Matter? A Case Study (Scalia and Vacca)	–
The degree of transparency in the electronic interdealer market for Italian government bonds changed in July 1997, when a move to quote anonymity was implemented in the MTS market. The 1997 decision to no longer disclose the names of market makers made the structure of MTS more similar to that of the OTC interdealer broker market, where dealers do not disclose their identities. If dealers trading OTC had benefited from the information disseminated by the MTS platform ahead of the 1997 switch, then one might have expected to see trading volume on the OTC market decline relative to that of the MTS market following the move to anonymity on the MTS system given the reduction in incentives for informed/large dealers to trade OTC. However, the authors find no impact in relative trading volumes after the 1997 change in transparency, suggesting that the reduction in transparency did not affect dealers' execution decisions on trading venue. The authors conclude that a decrease in transparency makes liquidity traders worse off, whereas large/informed traders find it less costly to execute block trades, as measured by the statistically significant increase in large trades following the decrease in transparency that stemmed from the move to anonymous trading. The authors' results suggest that the move to anonymity has been accompanied by an increase in market liquidity and by a reduction in volatility as well as an increase in the speed of information aggregation, suggesting that the reduction in transparency (via anonymous trading) was beneficial.	

(continued)

[31] S1, or secondary market transactions, excluding convertible bonds and 144As. See Table C3, 2010 Corporate Issue Information, 2010 TRACE FactBook (www.finra.org).
[32] Includes S1 customer buys and customer sells. Excludes interdealer trades. See Tables C19 and C24 from 2010 Corporate Transaction Information, 2010 TRACE FactBook (www.finra.org).
[33] See Table C9, Participant Information, 2010 TRACE FactBook (www.finra.org) and 2005 FactBook (www.finra.org/web/groups/industry/@ip/@comp/@mt/documents/appsupportdocs/p017618.pdf, p. 54).
[34] See footnote 22.
[35] See www.world-exchanges.org/news-views/views/expansion-trace-us-fixed-income-otc-market.

Exhibit 6 Key Academic Studies (continued)

Study/Description	Impact

2003: Comparing Possible Proxies of Corporate Bond Liquidity +
(Houweling, Mentink, and Vorst)

The authors study nine proxies for measures of liquidity in the European corporate bond market, including the number of contributors—the first study to do so using quote composition information. Even after controlling for maturity, rating, and interest rate risk and credit risk, the authors find that the number of market participants quoting the bond is positively correlated with lower yields, suggesting greater liquidity. Although market transparency is not exclusively proxied, the authors do consider whether or not the equity of the company in question is listed on an exchange, reasoning that companies whose equity is publicly listed must disclose more information than privately held companies. However, the hypothesis that the lower costs of making a market in the corporate bonds of listed companies (versus private companies) could not be confirmed via an examination of the data. Contrary to expectations, issues of private companies trade more actively and thus are more liquid than issues of listed companies, which may be explained by the fact that for private companies, debt is the only investment vehicle, whereas for public companies, both debt and equity are traded; therefore, debt of private companies might trade more and have higher liquidity.

2004: Corporate Bond Market Transparency and Transaction Costs +
(Edwards, Harris, and Piwowar)

Transaction costs are lower for bonds with publicly disseminated trade prices, as evidenced by the decline in costs following the advent of TRACE. The authors estimate transaction costs for three different sets of bonds—one sample that includes all bonds rated A and above that were TRACE-transparent throughout 2003 (given original issue sizes greater than $1 billion), a second sample that includes all bonds rated A and above that were not TRACE-transparent during 2003 (because their issue sizes were all less than $100 million), and a third sample that includes all BBB bonds with original issue sizes between $100 million and $1 billion (also not TRACE-transparent during 2003). Concerns that transparency would hurt liquidity were unfounded; the authors find that transparency decreases customer transaction costs by roughly 5 bps. Importantly, the decrease in transaction costs is generally greater for smaller trade sizes, although this finding is likely because of the fact that those making larger trades already have substantial knowledge of bond values, and hence lower initial transaction costs. The authors refute the main argument against transparency—that dealer inventory of higher credit risk bonds will be more difficult to manage—by noting the degree of transparency in the equity markets, which can serve as a source for hedging credit risk. The authors also point to additional transparency as a likely catalyst for the creation of more efficient market structures and innovative dealing strategies, which can further reduce transaction costs over time.

2005: Financial Intermediation and the Costs of Trading in an Opaque Market ↔
(Green, Hollifield, and Schürhoff)

The authors study every transaction in municipal bonds by registered broker/dealers between 1 May 2000 and 10 January 2004, corresponding to more than 26 million trades. They conclude that (1) more than two-thirds of the expected costs of trading can be ascribed to dealers' market power, (2) bonds with higher liquidity, measured by purchase frequency, earn dealers lower spreads, and (3) price uncertainty has decreased as transparency has increased. Although increases in transparency led to reductions in the dealers' bargaining power in retail-sized transactions (<$100,000), the same increase in transparency led to an increase in dealers' bargaining power with institutional-sized transactions.

Increased transparency appears to have reduced cross-subsidization from smaller traders in favour of larger traders, perhaps as greater transparency has encouraged more activity by smaller traders and thus increased liquidity, and led to less bargaining power for dealers in their trading with small traders, potentially because of the discipline imposed by timely reporting of price information.

2006: Market Transparency, Liquidity Externalities, and Institutional Trading Costs in Corporate Bonds +
(Bessembinder, Maxwell, and Venkataraman)

The authors' results indicate a reduction of approximately 50 percent in trade execution costs for bonds eligible for TRACE transaction reporting, with the difference between bids and offers for corporates narrowing by about half, or 8 bps, in the first year after the introduction of TRACE, a difference of about $2,000 per trade. The study also documented decreased market shares for large dealers and a smaller cost advantage to large dealers post-TRACE, suggesting that the corporate bond market has become more competitive after TRACE implementation. Smaller firms gained market share and larger dealers lost business because all traders were able to share the same prices. TRACE's influence cut bid margins by 20 percent even on securities whose prices were not disclosed because traders were able to obtain better comparisons, whereas trading expanded for all bonds after TRACE by 29 percent based on the 2002–03 data.

(continued)

Exhibit 6 Key Academic Studies (continued)

Study/Description	Impact
2006: European Corporate Bond Markets: Transparency, Liquidity, Efficiency (Biais, Declerck, Dow, Portes, and von Thadden)	↔/–
The authors find that corporate bond spreads are tighter in Europe than in the United States, even after the enhanced transparency that has followed TRACE's implementation, and suggest that this result is because of the degree of openness and competition in euro-denominated bond markets in relation to sterling and dollar markets, as well as the larger number of active dealers found in the euro-denominated bond markets. Their findings suggest that transparency could increase competition, which would reduce spreads, but could also possibly reduce competition, and thus market liquidity, if it forced a significant number of active dealers to exit the market, which could be a problem for less actively traded bonds.	
2006: European Government Bond Markets: Transparency, Liquidity, Efficiency (Dunne, Moore, and Portes)	–
In government bond markets, the authors find that greater transparency is associated with lower trade size and possibly with higher spreads, suggesting that some degree of opacity seems necessary to induce dealers to supply both liquidity and pre-trade information. Although effective spreads in the United States were generally smaller than on MTS—Europe's leading electronic exchange—the authors highlight that the narrower spreads in the United States may have resulted from a single set of benchmark bonds, in contrast to the much higher number of government and supra-sovereign entities in the EU.	
2006: Corporate Bond Market Transparency: Liquidity Concentration, Informational Efficiency, and Competition (Edwards, Nimalendran, and Piwowar)	+
The authors investigate the reasons behind the decline in transaction costs for investors following the introduction of post-trade price transparency in the U.S. secondary corporate bond market and the finding that transaction costs are significantly and negatively related to the degree of price transparency in the market. Because transparency not only allows investors and dealers alike to view transaction prices but also allows them to judge the relative liquidity of the bonds, increased transparency can create more trading in the relatively liquid bonds and less trading in the relatively illiquid bonds, with more trading in the more liquid set of bonds begetting even more trading (and hence more liquidity). However, the opposite results are obtained: The transparency-induced change in concentration of liquidity across bonds results in more concentration in relatively more illiquid bonds, consistent with an improvement in liquidity for all bonds (and not just the more liquid ones), which serves to counter the arguments brought up by the industry against creating post-trade transparency in other countries.	
Although price competition among dealers has increased slightly because of price transparency, the benefits do not appear to be accruing to all investors equally; the authors find evidence that transaction costs are positively related to the probability of trading with an informed investor.	
2007: Transparency and Liquidity: A Controlled Experiment on Corporate Bonds (Goldstein, Hotchkiss, and Sirri)	↔/+
The authors compare trades of TRACE-disseminated bonds with themselves before and after they were made transparent. They evaluate the trades of the disseminated bonds against those of matching but non-disseminated bonds (for which they were provided with data, despite the fact that such information was not public at the time), given that the initial phase-in of TRACE provided public dissemination only for investment-grade issues with issue sizes greater than $1 billion. Because pre-trade quote data do not exist for the sample set, the authors estimate the impact of transparency on spreads using two different techniques: (1) measuring spreads directly by measuring the round-trip cost of a dealer purchase from a customer followed by a sale of that bond by the same dealer to another customer (a dealer round-trip, or DRT) within a one-day period and (2) measuring spreads based on regression estimates of the difference between transaction prices and the previous day's estimated bid price as reported by Reuters.	
The authors conclude that adding transparency appears to have either a neutral or a positive effect on liquidity, although increased transparency is not associated with greater trading volume. Except for very large trades (trades greater than 1,000 bonds), spreads on newly transparent BBB bonds declined relative to bonds that experienced no transparency change, although the authors found no effect on spreads for very infrequently traded bonds. The authors conclude that the observed decrease in transaction costs is consistent with investors' ability to negotiate better terms of trade once they have access to broader bond-pricing data.	

(continued)

Exhibit 6 Key Academic Studies (continued)

Study/Description	Impact
2008: Markets: Transparency and the Corporate Bond Market (Bessembinder and Maxwell)	↔

The authors assess the impact of the increase in transparency on the market following TRACE's implementation, summarising the results of several previously published statistical analyses. The evidence indicates that the introduction of post-trade transparency in the corporate bond markets may have reduced the costs that investors pay to dealers for executing their trades in corporate bonds, while also decreasing the quality and quantity of the services formerly provided by bond dealers, potentially altering the incentives for dealers to serve as intermediaries. The introduction of TRACE reduced dealers' information advantage relative to customers and also reduced cross-sectional variation in the degree to which customers (both retail and institutional) are informed regarding bond values. The authors find that market participants—dealers and traders alike—were nearly unanimous in the view that trading is more difficult after the introduction of TRACE. To the extent that dealers hold less inventory than had previously been the case pre-TRACE, the difficulty and execution time related to filling large orders have grown. Given the informational advantage likely held by the largest dealers in an opaque market—which is mitigated in a transparent market—it is not surprising that one study cited finds that the concentration ratio, or the size of the trades completed by the largest 12 dealers, fell from 56 percent pre-TRACE to 44 percent post-TRACE.

There is some evidence that dealers have attempted to circumvent TRACE, although it is unclear whether such behaviour is caused by TRACE's introduction or occurred as a matter of happenstance (in part, related to an increase in leveraged buy-out activity and the effect of regulatory changes, including the Sarbanes–Oxley Act). For example, only publicly issued bonds fall under TRACE's mandatory trade reporting, whereas private bonds do not. A bond issue designed to allow for public registration at a later date will typically include registration rights; privately issued bonds without registration rights are referred to as '144A for life' bonds. That 144A for life bonds were just 7.3 percent of dollar volume in 2001 (and 9.6 percent of issues) prior to TRACE but grew to 27.8 percent in 2003, the first full year after TRACE initiation, and to 39.8 percent in 2004 (before declining to 16.9 percent in 2006) may be evidence of the effect that dealers had in guiding corporate issuance toward bonds out of TRACE's reach. The introduction of TRACE similarly accompanied an increase in trading of syndicated bank loans, as well as the growth of the CDS market—both instruments that trade away from the purview of TRACE. Corporate bond volume grew only modestly from 2001 to 2006, while syndicated loan trading volume almost tripled from 2001 to 2006 and CDS volume grew by an even greater magnitude; although not cited by the authors, this result may have been a function of capital rules, given banks' ability to hold less capital against a portfolio sold off balance sheet.

2009: Liquidity Commonality across the Bond and CDS Markets (Pu)	↔/+

The author analyses seven bond market liquidity measures, including trading frequency (number of trades in one month and number of days with at least one trade in a month), trading costs (effective bid–ask spreads and the inter-quartile range of traded prices, measured as the price differences between the 75th percentile and 25th percentile divided by the average price in a day), and trading prices (the ratio of absolute price change percentage to the dollar volume, the square root of this ratio, and the range, defined as the ratio of daily price range standardised by daily mean price to the dollar volume). Using a factor decomposition analysis, the author finds commonality across the various liquidity measures and shows that the liquidity common factors could help explain some of the changes in credit spreads that could not be attributed to factors surrounding default risk. The author concludes that the ability to more accurately measure liquidity (and specifically, trading costs, trading frequency, and trading prices) could lead to more efficient pricing of corporate bonds, particularly in the investment-grade sector. Because trading frequency is one direct output of post-trade transparency (at least with regard to the TRACE system in the United States), the ability to directly observe trading frequency itself could lend support to the idea of greater efficiency by way of explaining the portion of credit spreads not related to default risk. However, trade frequency dissemination, although necessary for observing trading frequency, does not, in and of itself, necessarily correspond to trading frequency or lead to a greater number of transactions.

(continued)

Exhibit 6 Key Academic Studies (continued)

Study/Description	Impact
2011: Missing the Marks? Dispersion in Corporate Bond Valuations across Mutual Funds (Cici, Gibson, and Merrick)	↔/+
The authors' results show that pricing dispersion by mutual funds marking their portfolio positions to market is related to bond-specific characteristics typically associated with market liquidity and market-wide volatility. Because fund managers are prone to smoothing their returns for reporting purposes, more transparency limits managers' efforts to smooth valuations as a result of holding hard-to-mark bonds. TRACE-mandated reporting was implemented on a staggered basis, giving the authors the ability to test whether the difference in dispersion between bonds subject to TRACE reporting and those not subject to TRACE reporting was statistically significant. The results are consistent with the view that the transparency-enhancing TRACE system contributed to increasing pricing precision, including a spillover effect for non-disseminated bonds. However, non-disseminated bonds showed decreases in dispersion that differed insignificantly from the decreases across disseminated bonds. As a result, the observed gradual decline in pricing dispersion over the sample period and the similar dispersion decline documented for the non-disseminated bonds suggest that TRACE might not have been the only reason for the decline in pricing dispersion.	
2011: Finding a Good Price in Opaque Over-the-Counter Markets (Zhu)	+
When the fundamental value of an asset is uncertain, market opacity and uncertain contact order can exacerbate adverse selection and lead to inefficient market breakdown. In a market without pre-trade transparency, a bond seller must individually contact many potential (dealer) buyers. Because the potential buyer does not observe negotiations elsewhere in the market, he or she faces contact-order uncertainty—uncertainty regarding the order in which a seller calls on competing buyers for a bid. When the seller and buyers have independent private values for owning the asset beyond its commonly known fundamental value, a returning seller invites adverse inference about the price quotes available elsewhere in the market (if other buyers' quotes were better, why would the seller be returning?). In this case, the seller takes into account the likely inference of the original buyer and marks his or her bid down accordingly. In transparent markets, large amounts of dispersed information would be aggregated through known public prices, whereas in opaque markets, the lack of price transparency prevents information aggregation. Increasing the number of dealers in opaque markets not only prevents information aggregation but also magnifies adverse selection, suggesting that more sources of potential liquidity do not overcome the lack of information available in a non-transparent market.	

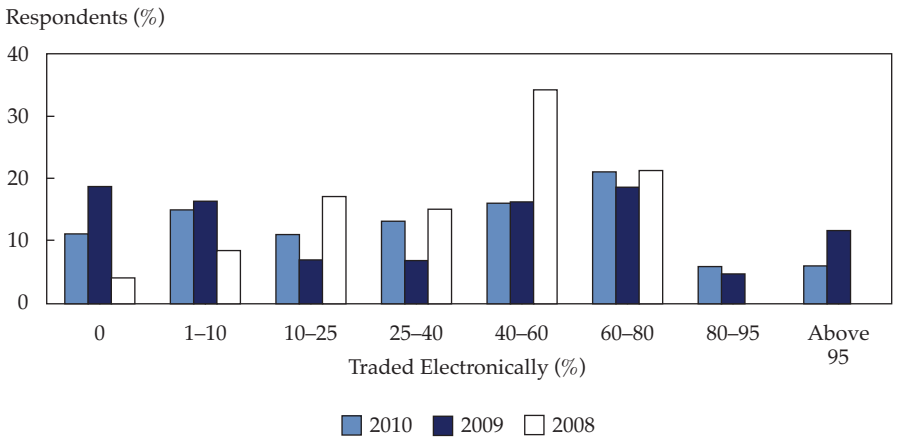
5 Electronic Markets: Displacing the Need for Pre-Trade Transparency?

Ongoing improvements in trading technology have resulted in an increasing amount of trading information provided to end users, a result that is likely to continue to evolve on its own via industry-led initiatives, even in the absence of government-mandated regulation. As observed from the review of the existing academic literature, the experience following TRACE's implementation suggests that, in aggregate, greater transparency has a beneficial effect on trading, particularly from the perspective of the buy-side investor. Indeed, some evidence shows that the industry has gravitated toward greater transparency even without a regulatory mandate, as the rise of electronic trading demonstrates.

As highlighted by Zhu (2011), in an environment where an investor has to check prices with dealers one at a time, repeated contact will frequently lead to inferior execution. For example, when sellers and buyers have independent private values for a given asset beyond its commonly known fundamental value, a returning seller invites adverse inference about the price quotes available elsewhere in the market. A seller may initially refuse an unattractive bid from one buyer, only to learn that other buyers' bids are even worse; upon contact by the seller for a second time, the original buyer infers that the seller's outside options are sufficiently unattractive to warrant the repeat contact and revises his or her bid downward accordingly. In short, transparency lowers search costs, increasing transaction efficiency and allowing investors to overcome the problems of repeat contact necessitated when one does not have a sense of current market pricing. Similarly, transparency fosters increased use of electronic trading platforms; investors should be more willing to submit electronic limit orders if they have enhanced knowledge of market conditions. As such, it is not altogether surprising to see the growth of electronic order books in the fixed-income market. Electronic trading platforms enable investors to bypass a salesperson and secure multiple quotes from dealers simultaneously and even allow for execution of odd lot trades directly with a market maker. Perhaps most importantly, however, most of these electronic platforms, including MarketAxess, Tradeweb, ICAP, and Bloomberg (all reviewed later), provide a fair degree of both pre-trade and post-trade transparency to investors and dealers alike. Newer entrants will be forced to do the same by virtue of competition, and not necessarily because of regulation.

Electronic trading of bonds in Europe continues to grow, albeit unsteadily, as shown in recent surveys conducted by the Association for Financial Markets in Europe (AFME) in Figure 4 and by the Securities Industry and Financial Markets Association (SIFMA)[36] in Table 5. The electronic market is still fairly fragmented. Outside of OTC trading, these volumes represent a very small share of the overall market, even as they represent a slight increase versus prior years. Electronic trading of credit products remains far behind the electronic trading of government bonds.

Figure 4 Percentage of Overall Trading Electronically in Europe



Source: Based on data from AFME, 6th Annual European Market Liquidity Conference 2011 (http://events.afme.eu/uploadedFiles/eventsafmeeu/2011/Market_Liquidity_2011/Programme%20Slides%20Both%20Streams.pdf).

Table 5 Electronic Sell-Side Tickets and Trade Volume

	% Tickets Traded Electronically			% Volume Traded Electronically		
Sell Side	This Year	Anticipated Next Year	% Increase Year-on-Year	This Year	Anticipated Next Year	% Increase Year-on-Year
ABS	16%	25%	56%	3%	6%	100%
CDS	0	9	—	0	2	—
Credit, investment grade	53	58	9	16	20	24
Repo	36	46	26	32	40	25
Credit, high yield	30	34	13	10	13	27

Source: Based on data from SIFMA, 4th Annual European Fixed Income e-Trading Survey (2009): www.sifma.org/uploadedfiles/research/surveys/sifma-fi-buysidesurvey09.pdf.

[36] SIFMA's 2009 e-trading survey noted that best execution and price transparency were the leading factors in participants' decisions behind trading a given product electronically, suggesting that electronic trading provides significant added value.

5.1. Electronic Trading Platforms Operating in Europe and Associated Transparency

In addition to Italy's MTS—the first European electronic market for government bonds—and the other RMs and MTFs registered in Italy (detailed in Section 3.2.iii), several electronic markets have expanded the scope of fixed-income instruments traded, with many offering platforms for trading European credit. The main electronic markets trading corporate bonds in Europe are summarised below, with the key features of the platforms shown in **Exhibit 7**.

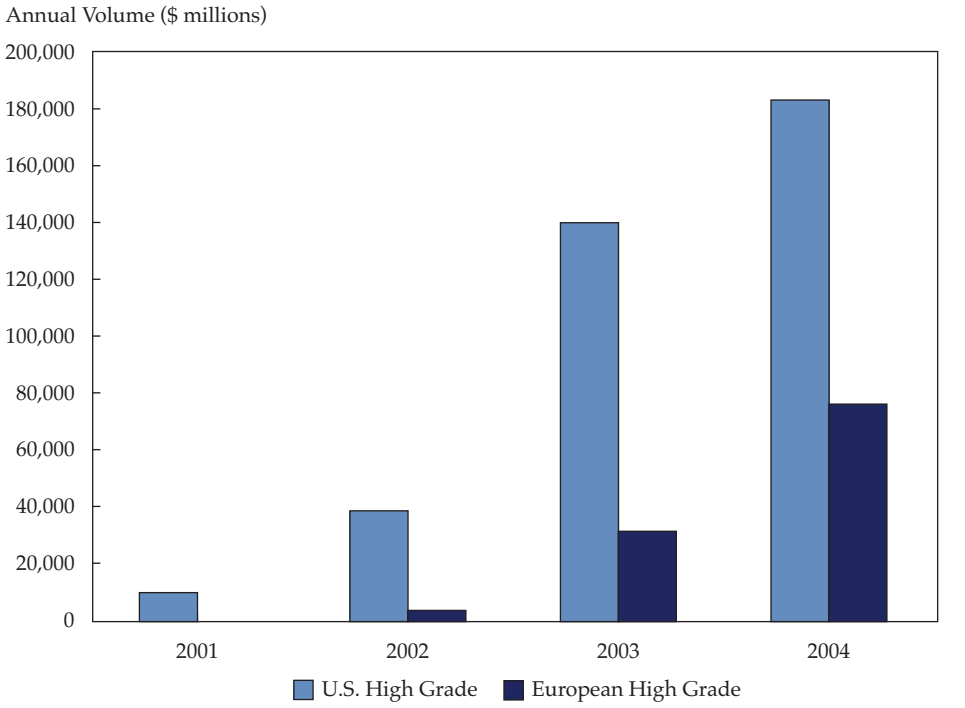
Exhibit 7 Transparency of Electronic Trading Platforms Operating in Europe

Platform	Open to	Pre-Trade Transparency	Post-Trade Transparency
MarketAxess (FSA-regulated MTF)	Dealers and institutional investors	Click-to-trade stack of streamed prices from dealers displayed by issue. Latest Markit iBoxx price for bond as well (if member of iBoxx index).	Trades executed on the platform over the last 30 days are displayed with a one-day delay, with direction, price, spread, execution date, and time. Size is not displayed.
Tradeweb Europe (FSA-regulated MTF)	Dealers and institutional investors	Real-time, streaming prices and inventory information from credit market makers. Clients may submit RFQs and view composite prices and multiple dealer inventories.	Tradeweb provides delayed information to market participants for trades executed on the platform for a fee.
ICAP (FSA-regulated MTF)	Dealers (interdealer)	Executable	Real time
Bloomberg	Bloomberg terminal users (dealer and institutional buy side)	Pricing information may be indicative and/or executable.	Information is contingent upon participating price providers passing through trade information.

MarketAxess, founded in April 2000, provides more than 800 institutional investors with a single trading platform to access multi-dealer competitive pricing in a wide range of credit products and operates in both the United States and Europe. Clients may request competitive, executable bids or offers from multiple broker/dealers simultaneously and can execute trades with the broker/dealer of their choice, choosing from more than 80 broker/dealers who participate on the MarketAxess platform. In early 2002, MarketAxess introduced a limit order market in corporate bonds. Prior to the advent of TRACE, corporate bond trading volume on MarketAxess was fairly small (just $7 billion over Q1 2002, pre-TRACE) but grew to $20 billion just a year later in Q1 2003 and stood at $85 billion by Q1 2011, as shown in **Figure 5**.

MarketAxess connects investment advisers, mutual funds, insurance companies, public and private pension funds, bank portfolios, and hedge funds with primary dealers and regional firms. In the United States, its trading system supports fully disclosed electronic trading in high-grade corporate bonds, high-yield/crossover bonds, emerging markets bonds, U.S.

Figure 5 MarketAxess U.S. and European High-Grade Volume, 2001–2004



Note: Phased-in implementation of TRACE began July 2002.
Source: Based on data from MarketAxess.

agency securities, and credit default swaps (CDS). MarketAxess provides market participants with real-time FINRA TRACE data enhanced with MarketAxess trade data and analytical tools. It also offers Corporate BondTicker, a web-based service that is integrated directly into the trading system and includes compliance monitoring tools as well as CDS analytics. MarketAxess first launched European secondary trading in U.S. dollar and euro-denominated eurobonds in 2001 and has since expanded its platform by adding trading in other European products, including sovereigns, supras, agency, and covered bonds. Its European BondTicker service, established in 2008, displays market standard pricing data with MarketAxess proprietary enrichments. MarketAxess also provides market data as a data feed that can be published externally to third-party subscribers or integrated directly into internal systems. MarketAxess, which was launched by just three dealers in 2000, is now a publicly held company. In Q1 2011 alone, 40,000+ line items of eurobond prices were streamed by a total of 39 European dealers representing $90 billion in bids and offers; total high-grade European trading volume was $11.3 billion.

Tradeweb was established in 1998, with the backing of First Boston, Goldman Sachs, Lehman Brothers, and Salomon Brothers, as the first multi-dealer online marketplace for U.S. Treasuries. Tradeweb is currently owned by Thomson Reuters and 10 leading dealers. Although Tradeweb's early operations focused on electronic execution of government bonds,

its platform has since expanded; in 2004, it added a marketplace for U.S. corporate bonds and added investment-grade European corporates in 2006 and high-yield European corporates in 2011. In addition, Tradeweb offers an interdealer electronic marketplace, as well as a retail marketplace (via its 2006 acquisition of LeverTrade). Even though Tradeweb operates in the United States as an SEC-registered broker/dealer (with its system regulated as an alternative trading system, ATS), in Europe, Tradeweb is authorised and regulated by the U.K. Financial Services Authority as an investment firm with permission to operate as an MTF. In Europe, Tradeweb grants access to its platform only to regulated investment firms or credit institutions or to a person who 'has a sufficient level of trading ability and competence . . . adequate organisational arrangements and . . . sufficient resources for the role it is to perform'. An individual user of the Tradeweb system may use the system as a buy-side customer or as a market-making dealer, but not both. (In order to be a market-making dealer on Tradeweb's European Credit Bonds Platform, a dealer must have an established trading and sales presence with at least 30 institutional buy-side customer relationships with whom it currently trades corporates, for example.)

Clients of Tradeweb's European Credit marketplace are able to view real-time, streaming prices and inventory information from credit market makers and can trade European credit from 7:30 a.m. to 6 p.m. London time. Clients may request a quote from up to six dealers or 'click-to-trade' on a dealer's indicative price. Users can also send a list of up to 20 bonds for pricing simultaneously. In addition to reporting services designed to satisfy best execution policies, Tradeweb offers comprehensive spread information on both a pre-trade and post-trade basis, as well as more detailed market data, sourced from more than 40 dealers, to provide streaming, real-time price updates, distributed via Thomson Reuters.

ICAP is the world's premier voice and electronic interdealer broker, serving the wholesale (rather than institutional or retail) markets in interest rates, credit, commodities, foreign exchange, and equity derivatives. More than 40 percent of ICAP's daily transaction volume is electronic. ICAP provides specialist intermediary brokering services to trading professionals in the wholesale financial markets, working to draw liquidity and match buyers and sellers and receiving a commission when a transaction is completed.

ICAP's presence in the corporate debt marketplace is represented by two subsidiaries—ICAP Corporates LLC and First Brokers LLC—through which it trades corporate bonds, credit derivatives, as well as eurobonds. However, it is its BrokerTec platform, which ICAP purchased in 2003, for which ICAP may be best known, although BrokerTec's focus is on U.S. and European government and repo markets.

Bloomberg L.P.'s professional service offers both single-dealer and multi-dealer trading on European bonds, including corporates. Clients may submit RFQs or trade via inventory displayed on single-dealer pages. Additionally, the All Quote feature provides price transparency by offering an overview of companies pricing a specific security and allows users to monitor current market data, with pricing refreshed automatically. Dealers show bid size and ask size alongside the last time their prices were updated. Users who have been enabled to trade with certain companies can also click-to-trade.

Bloomberg also offers a valuation service, which provides transparent evaluated price information on many bonds, including corporates, to create a BVAL price. BVAL prices are derived using a proprietary algorithm that is based on (1) direct observations, using trades, indicative quotes, and executable levels on a target security, and (2) historical tracking. For this historical tracking, Bloomberg calculates the historical correlation of a target security with direct observations of comparable bonds when observable market data on the target security are insufficient and then uses these direct observations on comparable bonds to derive a relative value price for the target security. Based on the strength of these inputs, in addition to a final BVAL price, a BVAL score is also provided (ranging from 1 to 10), which measures the quantity and quality of the market data used in each step of the pricing methodology. In addition, Bloomberg compiles a FIT (Fixed-Income Trading) composite, which, for corporate bonds, requires at least three executable pricing sources with prices and sizes on both sides of the market within a 15-minute window for display. A weighted average is calculated for the bid and ask sides independently, based on the number of pricing sources at the second and the third best pricing levels among all qualified dealers.

5.2. New Platforms for Euro-Denominated Corporates

The Cassiopeia Committee was formed in 2010 to explore ways of introducing secondary corporate bond trading platforms in Europe. It addressed market demands to improve transparency, liquidity, post-trade services, and reporting in the euro-denominated corporate bond market, regardless of where such bonds were issued. Comprising a group of almost exclusively French banks, regulators, and investment managers, the committee issued an Expression of Needs of 18 technical characteristics required of any new platform, stating, among other things, that any MTF would need to (1) be backed by a clearing house with a central counterparty to guarantee the successful completion of trades, (2) have pre- and post-trade transparency reporting, (3) have firm orders to buy or sell, and (4) be made available to all regulated financial institutions in Europe.

The committee concluded its mission in November 2010, when it stated that the three proposed platforms scheduled to launch in Paris during the second half of 2011—BondMatch (operated by NYSE Euronext), Galaxy (operated by TradingScreen), and MTS Credit (operated by the MTS Group)—integrated all of the criteria that the committee sought, including both the needs of issuers seeking better visibility for their securities (issuers will have a new system in which they can buy back their own debt securities without having to cancel them) as well as the needs of investors looking for greater liquidity and a frame of reference for European securities.

BondMatch will be a French-regulated MTF and will operate an order book with firm orders for price and size alongside continuous trading and transparent fees that will be open to all professional investors. The platform will be order driven (i.e., there will be no RFQs) and will operate with dedicated market surveillance to ensure fair and orderly markets. BondMatch's trades will be cleared by LCH.Clearnet. In addition, there will be

- no minimum or maximum order size,
- simple order types (e.g., market orders, limit orders, all or nothing orders), managed by the platform, as well as more complex orders, managed by the participants,
- circuit breakers (limit up/limit down),
- anonymity of orders,
- post-trade data accessible to participants and non-participants at a reasonable cost with a small delay,
- real-time or delayed access to the full order book, and
- calculation of reference prices and corresponding interest rate spreads for traded bonds.

Galaxy, a French-regulated MTF, will be open to any regulated institutional participant authorised to trade corporate securities in Europe. The corporate bond trading platform will accept only firm orders and aggregate them in a global order book with prices accessible to all participants. Post-trade information and transaction records will be made available publicly. Clearing of securities traded on the platform will be handled by LCH.Clearnet. TradingScreen clients, along with market participants, will be able to access the Galaxy corporate bond platform through TradingScreen's range of execution management interfaces or any of the leading execution management systems (EMS) or order management systems (OMS) available to the buy-side or sell-side community.

MTS Credit will enable trading between institutional investors and dealers in more than 2,400 investment-grade, euro-denominated corporate, financial, and covered bonds when it is launched in 2011. The platform will offer a choice of execution options to support a range of trading strategies, including (1) an all-to-all order book (regulated by the FSA as an MTF), where clients may post and execute orders directly, (2) an RFQ function, where clients may send outright, switch, butterfly, and multi-leg inquiries to up to five dealers, and (3) directly executable orders, where clients may click-to-trade on executable quotes provided by dealers.

5.3. Other Sources of Transparency Information

In addition to the trading platforms just cited, there is evidence that companies are providing more information about bond prices on their own initiative. Several internet-accessible databases of prices have been made available in recent years, suggesting that even without a regulatory mandate, the marketplace is bowing to demands for more transparency, particularly at the retail level.

For example, **Markit**, which was founded by sell-side executives working in credit, developed out of a need for independent valuation data. Markit makes much of its data available to the public for free (particularly with regard to CDS), but it also offers Markit Quotes, a real-time

quote parsing service that extracts indicative and live OTC pricing from e-mail messages, as well as Markit Evaluated Bonds, which provides independent pricing data on corporate and sovereign bonds across the investment-grade and high-yield universe. Distinct from prices culled from actual trade executions, Markit's Evaluated Bond prices are derived from multi-contributor price sources captured in real time.[37] The retail-investor-oriented website[38] supported by AFME offers Markit data.

Similarly, **Xtrakter**, part of Euroclear, provides capital markets data, much of which is also offered for free. Because 85 percent of all European fixed-income valuations use an Xtrakter data source, Xtrakter's free retail transparency website[39] is fairly comprehensive and provides average closing bid and offer quotes as well as the high, low, and median prices for bond trades in addition to average daily volume data for the prior two months at the end of each trading day, as shown in **Figure 6**. However, the universe covered by the free bond market transparency product includes only investment-grade debt with issuance of $1.5 billion or more and, as such, may exclude many of the less liquid bonds from its coverage. Although some of this information is undoubtedly helpful, from a practical standpoint, such information may not be relevant without a sense of current trading volume; large trades may move the market, distorting high and low prices on the day, whereas prices based on just one or two small trades may not provide a sense of the market depth for the investor who is looking to transact in meaningful size.

Xtrakter also offers a comprehensive subscription-based fixed-income price service. End-of-day bid and offer quotes are supplied by more than 30 investment banks, producing an average bid and average offer for more than 19,000 fixed-income securities daily. High, low, and average prices are also calculated from trades entered that day through TRAX, Xtrakter's trade matching and regulatory reporting system. (As a reference, TRAX covers an average of more than 45,000 trade executions daily, although this figure includes corporate bonds as well as governments, supranationals, asset-backed securities, and mortgage-backed securities.)

Additionally, average daily volume figures for each security derived from the TRAX trade input for the previous month are provided, which, in addition to informing market participants of the liquidity of a given issue, can provide dealers with a reliable way to estimate their own market share.[40] Daily files are downloadable at the end of the business day, with updates available after 9 p.m. London time. Although Xtrakter does not publish actual trade sizes or parties to the trade from its TRAX service, Xtrakter does publish monthly traded volume, providing total volume and number of trades by band.

[37] Markit also produces bond liquidity scores, which attempt to measure three main aspects of liquidity—tradable amounts, costs to trade, and execution time—by assessing the number of dealers quoting prices as well as the total number of quotes, in addition to bid–offer spreads, the maturity and rating of the issue, and a flag (and lower score) for quotes that reflect a one-sided rather than a two-way market.

[38] See www.investinginbondseurope.org.

[39] See www.BondMarketPrices.com.

[40] Similar to Markit's liquidity scores, Xtrakter's XVOL service assesses the liquidity of differing fixed-income securities by providing subscribers with the total volume figure for each security traded in the preceding month and a unique flag indicating the level of trading in each listed security within pre-defined bands. The service, which is based on the actual level of trading in the previous month and does not include synthetic data, can be viewed by ISIN.

Figure 6 Sample Search Results from Xtrakter's BondMarketPrices.com Website

Search Results

		Trade prices: 24AUG2011			Average Daily Volumes: JUN2011		Average Closing Quotes	
Security Name	Curr	High	Low	Median	No.Trades	Volume	Bid	Offer
A2A 4.5 02/11/2016	EUR	98.32	97.24	97.60	5	1350761	98.51	98.85
ABBEY NATIONAL TREASURY 3.125 30/06/2014	EUR	101.38	101.38	101.38	3	494285	101.20	101.57
ABBEY NATIONAL TREASURY 3.375 08/06/2015	EUR	101.76	101.25	101.25	< 1	178571	101.07	101.49
ABBEY NATIONAL TREASURY 3.375 20/10/2015	EUR	95.88	95.88	95.88	5	2819000	95.36	95.90
ABBEY NATIONAL TREASURY 3.625 05/10/2017	EUR	99.83	99.83	99.83	1	284047	99.41	99.91
ABBEY NATIONAL TREASURY 3.625 14/10/2016	EUR	101.14	101.06	101.10	1	265238	100.74	101.23
ABBEY NATIONAL TREASURY 4.125 03/03/2014	EUR	101.07	101.07	101.07	2	723523	99.89	100.28
ABN AMRO 4.25 11/05/2016	EUR	98.72	97.78	98.31	3	436857	97.50	98.30
ABN AMRO 4.75 04/01/2014	EUR	102.13	102.13	102.13	1	327380	101.98	102.48
ABN AMRO BANK 2.75 29/10/2013	EUR	100.09	99.55	99.87	8	1326476	99.73	100.01
ABN AMRO BANK 3.25 18/01/2013	EUR	102.28	102.23	102.26	1	702380	102.05	102.34
ABN AMRO BANK 3.25 21/09/2015	EUR	103.57	103.57	103.57	< 1	78571	103.37	103.74
ABN AMRO BANK 3.375 21/01/2014	EUR	101.19	101.09	101.19	1	500904	100.86	101.12
ABN AMRO BANK 3.75 15/07/2014	EUR	105.14	104.98	105.00	1	421428	104.79	105.09
ABN AMRO BANK 4.25 11/04/2016	EUR	101.77	101.77	101.77	3	2176809	101.31	101.77
ABN AMRO BANK 6.375 27/04/2021	EUR	98.99	96.97	97.24	6	2807571	96.67	97.68
ALLIANZ FINANCE II 4.0 23/11/2016	EUR	104.19	104.19	104.19	3	1216666	104.33	105.43
ALLIANZ FINANCE II 4.75 22/07/2019	EUR	106.12	106.00	106.06	1	490476	106.03	107.26
ALLIANZ FINANCE II 5.75 08/07/2041	EUR	92.01	84.22	85.24	5	2957142	84.44	85.95
ALLIANZ FINANCE II 6.125 31/05/2022	EUR	98.50	98.25	98.25	3	723714	97.84	99.15

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Source: Xtrakter (www.bondmarketprices.com/Search.aspx).

The London Stock Exchange's **Order book for Retail Bonds (ORB)**, launched in February 2010, enables retail investors to trade a select number of U.K. corporate bonds (in addition to gilts and supranationals), with prices subject to a 15-minute delay, alongside performance charts and market news. **Bondscape**, a 10-year partnership between Winterflood Securities and Barclays Capital (and recently added HSBC), is a free bond trading platform for professional investment advisers with more than 200 tradable products, including eurosterling corporate issues.[41] Bondscape shows the best bid–offer and market depth behind all currently submitted prices and provides continuous liquidity during the business day. Closing prices are posted on its website to the public.[42] Retail investors may also be able to access prices from some of the interdealer platforms, although access is frequently subject to a release delay.

[41] A sample is shown at www.bondscape.net/epic_codes.pdf.
[42] See at www.bondscape.net/feed.html.

6 Conclusion

This report provides a comprehensive review of bond market transparency requirements in Europe—in particular, in Italy—and in the United States. It looks at the academic literature relating to the effects of increased bond market transparency in different markets, including the experience of TRACE in the United States and MTS in Italy. Finally, it considers how new electronic marketplaces have the potential to change the way bonds are traded.

In general, and to a large degree, the academic literature supports the contention that the benefits of increased transparency in the bond markets—in this case, post-trade transparency—outweigh the costs of compliance for liquidity providers. In particular, the literature suggests that broader dissemination of post-trade information has lowered trading costs for investors. In some cases, the benefits were seen accruing to primarily institutional investors, and in others, the benefits were more widespread.

The literature also suggests that these lower trading costs for investors came primarily as a result of the more transparent market, negating the information advantage that dealers previously had over investors. This reversal had the effect of increasing the degree of price competition in the marketplace and limiting the ability of dealers to set prices arbitrarily.[43]

The best evidence of the benefits of increased transparency came in the studies of TRACE conducted since 2004. TRACE required increased post-trade reporting for OTC secondary market transactions in U.S. fixed-income securities beginning in 2002. Of the five studies that expressly reviewed and analysed the effects of TRACE's introduction, all concluded the effects were at worst neutral, with four finding positive effects. These studies suggest that a gradually phased-in system of post-trade reporting, as was done with the introduction of TRACE in the United States, does not need to be disruptive.

By contrast, of the four studies specifically looking at the European bond markets, three expressed neutral to negative views about transparency. These views were expressed despite recognition of the benefits seen in the U.S. markets as a consequence of TRACE, and despite the lack of an EU-wide transparency requirement. In the analysis of their study of the European corporate bond market, Biais, Declerck, Dow, Portes, and von Thadden (2006) conclude that an EU-mandated transparency requirement is unnecessary given the efficiency of the euro-denominated corporate bond market relative to the sterling-denominated and U.S. bond markets. They also say greater transparency may lead to a reduction in the number of dealers competing in this market, with detrimental effects for spreads and market liquidity.

[43] As an example, it is a violation of the NASD's Rule 2440 and Rule 2110 'for a member to enter into any transaction with a customer in any security at any price not reasonably related to the current market price of the security'.

This concern, however, is considered and rejected by more recent studies on the effects of TRACE. In particular, the increased transparency was seen as benefiting bonds with low liquidity more than those with high liquidity (see Edwards, Nimalendran, and Piwowar 2006). More importantly, Bessembinder and Maxwell (2008) note that although dealers and traders found trading more difficult under TRACE, the concentration of trade volume for the largest 12 dealers fell from 56 percent prior to the introduction of TRACE to 44 percent post-TRACE, suggesting that the increase in transparency opened the market to new competition from other dealers. This finding, together with the view of Biais, Declerck, Dow, Portes, and von Thadden (2006) that more dealers participating in the market leads to a more efficient market, suggests that an increase in transparency would not negatively affect pricing and would likely enhance the efficiency of the euro-denominated fixed-income market, thus tightening spreads even further.

Whilst implementing a post-trade transparency regime appears feasible particularly in light of TRACE's longevity in the United States (and its expansion to other types of bond markets), the pre-trade transparency requirements under MiFID would not seem suited to the microstructure of the bond market. Because one of the main differences between equity and bond markets—even away from the differences in turnover, trading size, and investor type—is the degree of intermediation in bond market trading, it is hard to envision a method whereby mandatory pre-trade transparency in corporate bond markets would be viable across all venues and OTC. It is one thing to mandate a continuous market by government bond specialists (as is the case in Italy) who must provide a two-way market for a select number of issues; it is quite another to require a dealer to make a market in the €1.8 trillion European corporate bond market (excluding banks and financials), where the average deal size is a little more than €400 million.[44]

With post-trade transparency, authorities face a challenge with regard to how trade information should be aggregated and disseminated, particularly in the absence of a centralised reporting system in Europe. As an example, there are already numerous reporting platforms for equity reporting in Europe—ranging from exchanges (for both order-book and off-order-book trades) to specialist OTC reporting services (such as Markit BOAT) to other data vendors (such as Thomson Reuters). Indeed, Trade Data Monitors[45] are just one way for OTC equity trades to be reported. However, efforts to improve the quality and consistency of OTC equity trade reporting and to standardise data formats across venues suggest that the challenge of aggregation and dissemination of post-trade transparency information for the bond market can be overcome.

The European Commission will also likely have to counter an ongoing argument that trade reporting may reveal a dealer's 'hand' and that dealers will be less likely to participate in those markets where public knowledge of any large trade could cause adverse price movements given

[44] See the AFME/SIFMA Q1 2011 European High Yield and Leveraged Loan Report.
[45] The FSA created the Trade Data Monitor framework for facilitating post-trade transparency obligations for investment firms outside an RM or MTF (see www.fsa.gov.uk/pubs/cp/cp07_16.pdf).

the dealer's likely need to offset some of his or her risk through subsequent trades. However, this challenge could easily be addressed by making the size threshold at which a given trade's volume is (or is not) explicitly revealed a function of the underlying issue size of the security as well as the frequency with which it has traded over a prior look-back period.

It also would make sense to gradually implement any new regulation, as was done in the United States with TRACE. The Commission would be wise to phase in any trade transparency regulation so that investors can make a smooth adjustment to any new framework. Additionally, the Commission may consider holding back the information it initially collects for a period of six months to a year (as FINRA is doing with the collection of mortgage-backed securities data in the current TRACE collection) in order to allow academics, practitioners, and dealers to conduct their own before and after comparisons of any impact from the regulation.

It will also be helpful to analyse whether volume and turnover in corporate bonds is low, not because of a fragmented market, a lack of liquidity, or unwillingness by firms to trade in a market where such a great asymmetry of information exists but because the bonds' end users tend to be buy-and-hold accounts. Many institutional investors—whether insurance companies, pension funds, or investment funds—absorb most of an issue after it first comes to market and keep turnover very low. The Commission should be prepared to address this issue, particularly if a lack of retail volume fails to accompany any transparency mandate.

The debate regarding optimal transparency of the corporate bond markets is likely to continue. It is possible, although unlikely, that improvements in the corporate bond market will render the need for post-trade transparency obsolete. To the extent that investors' preferences for electronic trading platforms grow—even if it is as a result of some of the auxiliary benefits to electronic trading, such as straight-through processing for trade allocation, settlement, and clearing—the need for mandated transparency may diminish. Investors may 'vote with their feet' (or keyboards) and migrate to those platforms that, ahead of the implementation of new rules, already provide some degree of transparency in European corporate bond markets. However, at this juncture, the experience with post-trade transparency in OTC markets in Italy as well as corporate markets in the United States justifies mandatory post-trade transparency, which would benefit retail and institutional investors alike. Although many investors would also find pre-trade transparency helpful, practical considerations would prevent any meaningful information relay, given the fact that nearly 90 percent of European fixed-income securities are traded OTC on an RFQ basis. Until the function of a dealer becomes closer to that of a crossing network rather than an intermediary, it is difficult to see how a dealer could provide a continuous, two-way market on hundreds of thousands of bonds.

Appendix I: Existing Trading Transparency in Europe for Listed Bonds

	Information Disseminated to Exchange Users about Trades on the Exchange			Information Disseminated to the Public about Trades on the Exchange				Listed Bonds Traded Off-Market	Listed Bonds Traded on ATS Information Disseminated to the Public			
Country	Pre-Trade	Post-Trade	Set By	Pre-Trade	Post-Trade	Set By	Disseminated By	Dissemination	Pre-Trade	Post-Trade	Set By	Disseminated By
Austria	Real-time	Real-time	Regulatory authority & exchange	Real-time	Real-time	Regulatory authority & exchange	Exchange and information vendors	Reported to regulatory authority; not disseminated	N/A	N/A	N/A	N/A
Finland	N/A	Real-time	General obligation for transparency is laid down by a parliament act, technical details by the Helsinki Stock Exchange	N/A	Real-time for a fee or delayed	General obligation for transparency is laid down by a parliament act, technical details by the Helsinki Stock Exchange	Helsinki Stock Exchange	Reported to the central securities depository but not disseminated to public	N/A (no ATS for bond trading in Finland)	N/A (no ATS for bond trading in Finland)	N/A (no ATS for bond trading in Finland)	N/A (no ATS for bond trading in Finland)
France	Real-time	Real-time	Regulatory authority & exchange	Real-time	Real-time	Regulatory authority and exchange	Exchange and information vendors	Reported to regulator or to the market operator/operator of the payment and settlement system; not disseminated	N/A	N/A	N/A	N/A
Germany	Real-time	Real-time	Regulatory authorities and exchange	Real-time	Real-time	Regulatory authorities and exchange	Exchange and information vendors	Reported to regulatory authorities but not disseminated	None	None	N/A	No transparency requirements
Greece	Real-time	Real-time	Regulatory authorities and market operators	Real-time	Real-time	Regulatory authority and market operators	Information vendors	Reported to operator of the payment and settlement system; not disseminated	N/A	N/A	N/A	N/A

(continued)

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Appendix I: Existing Trading Transparency in Europe for Listed Bonds (continued)

	Information Disseminated to Exchange Users about Trades on the Exchange			Information Disseminated to the Public about Trades on the Exchange				Listed Bonds Traded Off-Market	Listed Bonds Traded on ATS Information Disseminated to the Public			
Country	Pre-Trade	Post-Trade	Set By	Pre-Trade	Post-Trade	Set By	Disseminated By	Dissemination	Pre-Trade	Post-Trade	Set By	Disseminated By
Hungary	Real-time	Real-time	Regulatory authority and exchange	Real-time for a fee; delayed for free	Real-time for a fee; delayed for free	Regulatory authority and exchange	Exchange and information vendors	Reported to the regulatory authority. Made public in a limited and consolidated way (information on OTC transactions completed through the Hungarian Central Clearing House is publicly available in consolidated form by security on weekly basis with a delay of four days)	N/A	N/A	N/A	N/A
Italy	Real-time	Real-time	Regulatory authorities and exchanges	Real-time for a fee; delayed for free	Real-time for a fee; delayed for free	Exchanges and regulatory authorities	Exchanges and information vendors	Reported to the exchange and disseminated in 1 hour	Real-time	Real-time	Regulatory authorities	ATS
Luxembourg	Real-time	Real-time	Exchange under regulatory requirements	Only on request through market members	Delayed publication (min. 15 minutes)	Exchange	Exchange and information vendors	Reported to the authority but not disseminated	Only on request through market members	Delayed publication (min. 15 minutes)	Exchange	Exchange and information vendors
Netherlands	Real-time	Real-time	Exchange	Real-time	Real-time	Exchange	Exchange and information vendors	Reported to regulator or to the market operator/operator of the payment and settlement system; not disseminated	N/A	N/A	N/A	N/A

(continued)

Appendix I: Existing Trading Transparency in Europe for Listed Bonds (continued)

	Information Disseminated to Exchange Users about Trades on the Exchange			Information Disseminated to the Public about Trades on the Exchange				Listed Bonds Traded Off-Market	Listed Bonds Traded on ATS Information Disseminated to the Public			
Country	Pre-Trade	Post-Trade	Set By	Pre-Trade	Post-Trade	Set By	Disseminated By	Dissemination	Pre-Trade	Post-Trade	Set By	Disseminated By
Portugal	Euronext Lisbon – Real-time	Euronext Lisbon – Real-time	Regulatory authority and exchange	Euronext Lisbon – Real-time	Euronext Lisbon – Real-time	Regulatory authority and exchange	Exchange and information vendors	Reported to the exchange until two working days after the transaction is concluded; disseminated daily	N/A	N/A	N/A	N/A
	MTS Portugal – Real-time	MTS Portugal – Real-time	Regulatory authority and exchange	Disseminated	Daily and real-time	Regulatory authority and exchange	Exchange and information vendors		N/A	N/A	N/A	N/A
Spain	MERF – Real-time	Real-time	Exchange and regulatory authority	Real-time	15-minute delay	Regulatory authorities and exchange	Exchange and information vendors	Reported to the exchange and disseminated the same day (if reported before closing time) or the following day (if reported after the market is closed)	N/A	N/A	N/A	N/A
	AIAF – At request	Volumes, no prices	Exchange and regulatory authority	At request	Volumes, no prices	Exchange and regulatory authorities	Exchange and information vendors	N/A	N/A	N/A	N/A	N/A
Sweden			Exchange			Regulatory authority and exchange	Exchange and information vendors	Reported to the exchange and aggregated info is disseminated the following day before 9:00 a.m.	N/A	N/A	N/A	N/A
Retail markets	Real-time	Real-time		Real-time	Real-time							
Institutional markets	Real-time	Aggregated info the following day		Real-time	Aggregated info the following day							

(continued)

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Appendix I: Existing Trading Transparency in Europe for Listed Bonds (continued)

	Information Disseminated to Exchange Users about Trades on the Exchange			Information Disseminated to the Public about Trades on the Exchange				Listed Bonds Traded Off-Market	Listed Bonds Traded on ATS Information Disseminated to the Public			
Country	Pre-Trade	Post-Trade	Set By	Pre-Trade	Post-Trade	Set By	Disseminated By	Dissemination	Pre-Trade	Post-Trade	Set By	Disseminated By
United Kingdom	Real-time	Real-time for agency trades; delays for principal trades; no volumes for dealer trades	Exchange, under regulatory requirements	Market maker quotes	Prices only	Exchange and information vendors	Exchange and information vendors	Reported to regulatory authority but not disseminated	None	Benchmark bonds; within 30 minutes, size cap on volumes disclosed	FSA	ATS and information vendors

Notes: N/A = not applicable. The Helsinki Stock Exchange only formalizes members' negotiated transactions in listed bonds and, therefore, 'pre-trade' is not applicable.

Source: Based on CESR's Response to the Commission on Non-Equities Transparency, Ref: CESR/07-284b.

Appendix II: MiFID Definitions

Multilateral trading facility (MTF): A multilateral system, operated by an investment firm or a market operator, which brings together multiple third-party buying and selling interests in financial instruments—in the system and in accordance with non-discretionary rules—in a way that results in a contract, with transparent and non-discretionary rules and procedures for fair and orderly trading and objective criteria for the efficient execution of orders.

Regulated market (RM): A multilateral system operated and/or managed by a market operator which brings together or facilitates the bringing together of multiple third-party buying and selling interests in financial instruments—in the system and in accordance with its non-discretionary rules—in a way that results in a contract, in respect of the financial instruments admitted to trading under its rules and/or systems, and which is authorised and functions regularly.

Systematic internaliser (SI): An investment firm that deals on its own account by executing client orders in shares outside a regulated market or MTF and performs that activity on an organised, frequent, and systematic basis.

Organised trading facility (OTF): Any system or facility, which is not a regulated market or MTF, operated by an investment firm or a market operator in which multiple third-party buying and selling interests in financial instruments are able to interact in the system in a way that results in a contract.

Over the counter (OTC): Transactions that are ad hoc and irregular and are carried out with wholesale counterparties as part of a business relationship which is itself characterised by dealings above standard market size and where the deals are carried out outside the systems usually used by the company concerned for its business as a systematic internaliser.

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