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Corporate Bond Liquidity Solutions Emerging

GREENWICH ASSOCIATES

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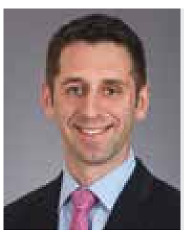


Kevin McPartland is the Head of Research for Market Structure and Technology at Greenwich Associates.

AS E-TRADING IN U.S. CORPORATE BONDS IS GROWING, OVER 80% OF THE ROUGHLY $6 TRILLION TRADED ANNUALLY IS STILL MATCHED AND EXECUTED OVER THE PHONE

WITH TRADING DESKS ON BOTH THE BUY AND SELL SIDE NOW SMALLER, TECHNOLOGY TO HELP THE HIGH-TOUCH BUSINESS IS NEEDED AS WELL

Executive Summary

Investors continue to express frustration with credit market liquidity, but massive efforts undertaken by market participants and service providers are finally starting to ease the pain. Success has started to arrive via solutions that open up the pool of potential buyers and sellers, and platforms that mine data to create a view into the location of every bond in the world.

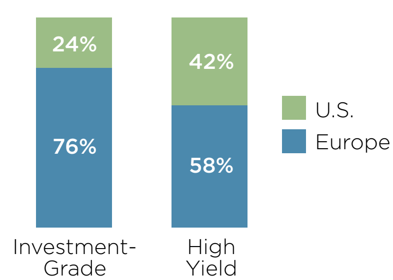
The former is a very logical step, with increased volumes on all-to-all platforms a tangible sign of progress. The latter is an even more complicated undertaking and could arguably be more impactful over the long run. If Uber can upend the taxi business without owning any cars, it might be possible for a complete data set with the right intelligence to create a virtual balance sheet without having one of its own. As such, putting the two solutions together should take us a long way toward a more fluid secondary market.

This research examines changes in fixed-income investor behavior as it relates to market electronification and examines the market's remaining incumbent and new technology solutions best placed to drive change going forward.

METHODOLOGY

Between February and July 2016, Greenwich Associates interviewed 998 U.S. institutional investors and 1,132 European institutional investors active in fixed income. Interview topics included trading and research activities and preferences, product and dealer use, service provider evaluations, market trend analysis, and investor compensation.

BUY-SIDE RESEARCH PARTICIPANTS BY REGION AND PRODUCT FOCUS



Introduction

The explosion of new corporate bond-related technology initiatives has slowed to a simmer. In the first few weeks of 2015, Greenwich Associates published research outlining 18 different corporate bond-trading initiatives in the U.S. Nearly 40% of those have either closed, been acquired or are in the process of restructuring.

Those that have closed or are restructuring have seen that their business models weren't resonating with the market or that their competitors were implementing ideas more effectively. The few that have been acquired are testing the idea that clients do, in fact, want choice in how they trade, but they want that choice under one roof—or more accurately, on one screen.

What's left is still a very competitive landscape of firms and offerings that bring needed value to the corporate bond market, all hoping to revitalize trading following the market structure disruptions of the past several years. Changes in the electronic-trading landscape have taken center stage, with buy-side e-trading volume continuing to grow in both the U.S. and Europe. Trading via the traditional request-for-quote model has grown, as has trading via models newer to corporate bond investors, including auctions and all-to-all crossing networks.

CORPORATE BOND ELECTRONIC TRADING—PERCENTAGE OF NOTIONAL VOLUME

Note: Based on 296 responses from investment-grade and high-yield investors in Europe and 195 responses in the U.S.
Source: Greenwich Associates 2016 European and North American Fixed-Income Studies

While electronic execution is a huge part of the market's evolution, providers of liquidity intelligence, information aggregation and market data/analytics are increasingly important. Remember that as e-trading in corporate bonds is growing, over 80% of the roughly $6 trillion traded annually in the U.S. market is still matched and executed over the phone or via instant messenger. With trading desks on both the buy and sell side now smaller, technology to help the high-touch business is needed as well.

Drivers of Change

Although years in the making, the new face of corporate bond liquidity still makes the buy side anxious. Of the more than 400 credit investors interviewed by Greenwich Associates in the U.S. and Europe in 2016, over 80% still feel that reduced market liquidity is impacting their ability to implement their investment strategy.

While new regulations have generally disincentivized large bond dealers from providing principal liquidity, institutional investors are beginning to accept the current environment as normal and are now working to find new solutions, counterparties and ways of doing business. This focus explains why the corporate bond technology market is starting to shake out, with the winners slowly floating to the top.

This is also why we decided to re-examine the landscape and opportunities in each sub-segment. At the turn of the century, trading was done with a few large counterparties over the phone, with e-trading as no more than an afterthought. Today, technology is the center of a buy-side trader's world, from small odd-lot executions to bond pricing to knowing whom to call and why. Understanding those specific technologies and the providers and opportunities for each makes divining what's next almost possible.

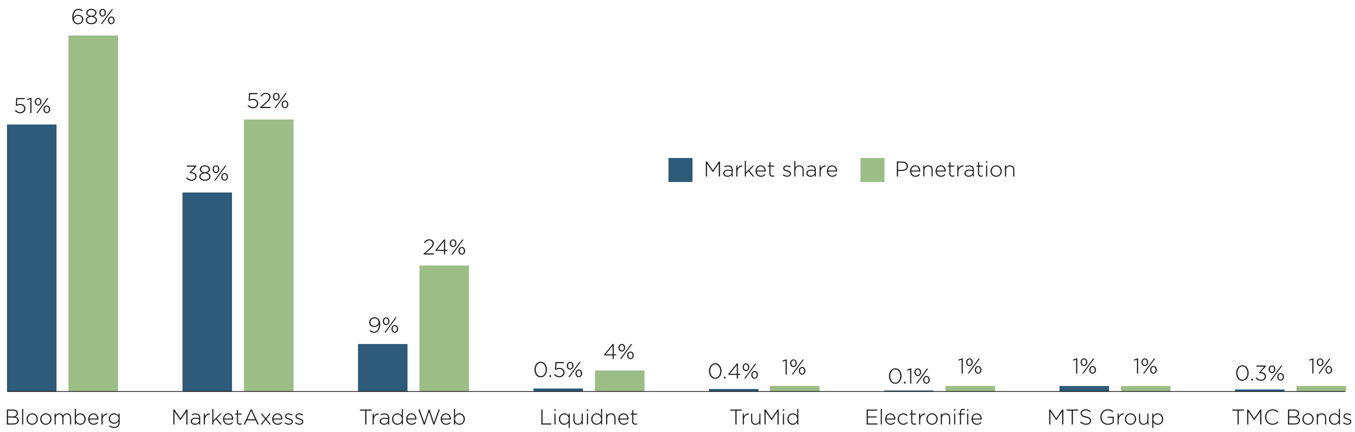
Who's Who in Execution

Market Segment	Expected Growth	Profitability	Competition	Overall Opportunity
Trade Execution <$2M	Medium	Low	High	Medium
Trade Execution >$2M	Medium	Medium	High	High

Bloomberg, MarketAxess and Tradeweb are the three biggest corporate bond trading venues for U.S. and European credit investors. MarketAxess continues to dominate in the U.S., with 80% market share and its front end on 88% of buy-side desktops. Bloomberg leads in Europe, with 73% market share among 92% of credit investors on the platform. When Greenwich Associates interview data is combined across the two regions, the gap between the top two shrinks dramatically. Last but not least, Tradeweb has grown from a near-standing start just a few years ago. All are vying for more lucrative block-sized trades over $2 million that have until recent years eluded online platforms.

These three are also the only firms that have a solution for every piece of the trading workflow as defined by Greenwich Associates. Bloomberg and MarketAxess have built from within, while Tradeweb has expanded

GLOBAL CORPORATE BOND E-TRADING MARKET SHARE AND PENETRATION

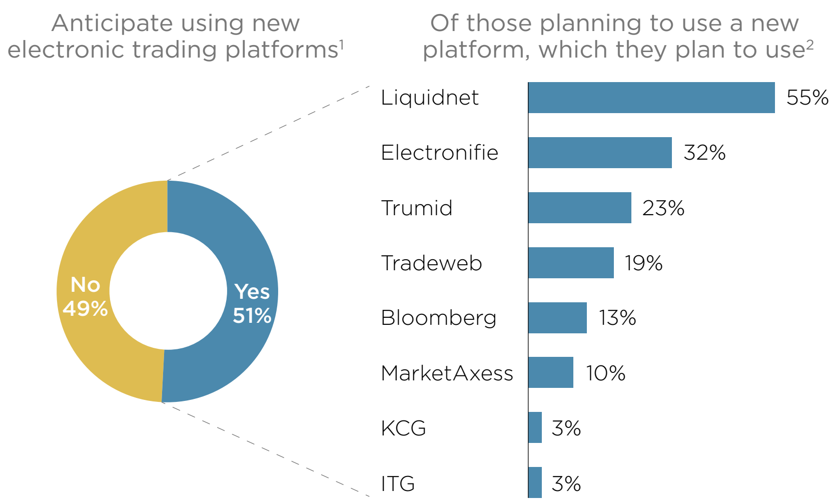


Note: Market share is volume weighted. Penetration is based on investor usage of the platforms regardless of volume executed.
Based on 407 responses from high-yield and investment-grade investors in the U.S. and Europe.
Source: Greenwich Associates 2016 European and North American Fixed-Income Studies

its offering via acquisition and internal build. Providing everything in one place can further cement these platforms on the desktop—an approach that has been proven successful.

While established providers continue their success, half of our U.S. study participants said they plan to start adding an execution platform they are not currently active on in the coming year. Liquidnet tops that list, with investors drawn to the platform's ability to seek out natural matches via blotter-scraping, which enables the trader to see benefits without much additional effort. While Electronifie is exploring its options, TruMid revamped its technology and parts of its model and is seeing early success with the updated approach.

ANTICIPATED USE OF ELECTRONIC TRADING PLATFORMS



Note: [1]Based on responses from 67 investment-grade credit investors in the U.S.
[2]Based on responses from 31 investment-grade investors in the U.S.
Source: Greenwich Associates 2016 North American Fixed-Income Study

It is important to note, however, that this is not a zero-sum game. Some investors plan to add new venues to their liquidity-seeking process, but few if any are looking to replace. As such, expect the incumbents to continue their growth trajectory while the new entrants work to find and grow their particular market segment.

Pricing Data

Market Segment	Expected Growth	Profitability	Competition	Overall Opportunity
Data Providers	Medium	High	High	High

It remains debatable whether electronic trading requires robust market data to grow, or conversely that e-trading is needed to generate said market data. In the 1970s, Nasdaq consolidated quotes on the screen, which a decade later led to electronic execution. But that was almost 50 years ago. Today electronic trading and market data feed on one another in a virtuous cycle, rather than one leading to the birth of the other.

Continuous, indicative pricing from corporate-bond market makers in every outstanding issue is an unrealistic expectation. There are too many bonds to cover and not enough market makers properly incented to provide constant quotes for all of them. As such, continuous, evaluated pricing is the next best thing.

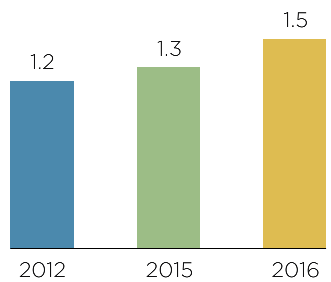
Bloomberg (which acquired the assets of Benchmark Solutions), ICE (which acquired Interactive Data) and Markit all provide continuous, evaluated prices for nearly every corporate bond. MarketAxess has also stepped into this world with composite pricing for bonds traded on its platform. Given the reputation of each of those firms, we can comfortably say the quality of the data will only grow. However, in a market where dealers are less willing to make prices in general and investors are increasingly able to place resting orders with price limits into the market, a source of conflict-free theoretical pricing can help encourage trading where none would have happened before.

Aggregation

Market Segment	Expected Growth	Profitability	Competition	Overall Opportunity
Information Aggregation	High	Low	High	Low

Although 93% of an institutional investor's electronic trading is still done via their primary platform, the average number of platforms has slowly risen over the past three years—from 1.2 in 2014 to a stable 1.5 in 2016. Given that increased need to connect to multiple liquidity sources, the importance of consolidating the influx of daily dealer runs and the growth of real-time bond pricing data, technology to pull all of that together is growing in importance.

AVERAGE NUMBER OF PLATFORMS USED



Note: Based on 82 responses in 2012, 77 in 2015, and 80 in 2016.
Source: Greenwich Associates 2016 North American Fixed-Income Study

Providers that fall into this category are as varied as their particular solutions. Order and execution management providers have been working diligently over the past several years to offer tools—common in equity markets since the 1990s—for the electronifying fixed-income market. This includes access to market data, axes and multiple liquidity venues, but also to markets for related credit products such as ETFs, cleared credit-default swaps (CDS) and CDS futures. According to Greenwich Associates research, Bloomberg AIM, BlackRock Solutions' Aladdin and Charles River IMS are used by the largest number of firms, rivaled primarily by internally built systems, which are still common in these markets.

Neptune is also in the aggregation game, but in a very different way. It is designed to standardize the daily circulation of trading interests between the buy and sell side, a process that still relies heavily on Excel spreadsheets. They're hoping not only to collect this data, but also to standardize the formats used by the market participants to ease the burden of ingesting and utilizing the data in aggregate. Bloomberg's IMGR offering provides similar functionality for information exchanged between market participants via their terminal.

Also worth noting is MarketAxess' Trax, a platform that acts as Europe's answer to TRACE in the U.S., by collecting executed trade data from market participants that it then aggregates and distributes to clients on an anonymous basis. The level of market transparency provided by Trax in Europe was achieved in the U.S. only via regulatory mandate.

Market Segment	Expected Growth	Profitability	Competition	Overall Opportunity
Liquidity Intelligence	High	High	Medium	High

Liquidity Intelligence

While electronic trading growth in corporate bonds tends to make the headlines, improving the human-aided liquidity-seeking process is an increasingly huge part of the story. Data provided by Algomi suggests that bond dealers are unable or unwilling to provide prices on more than 90% of client inquiries for illiquid bonds. Furthermore, remember that over 80% of investment-grade and high-yield volume in the U.S. market is still done over the phone.

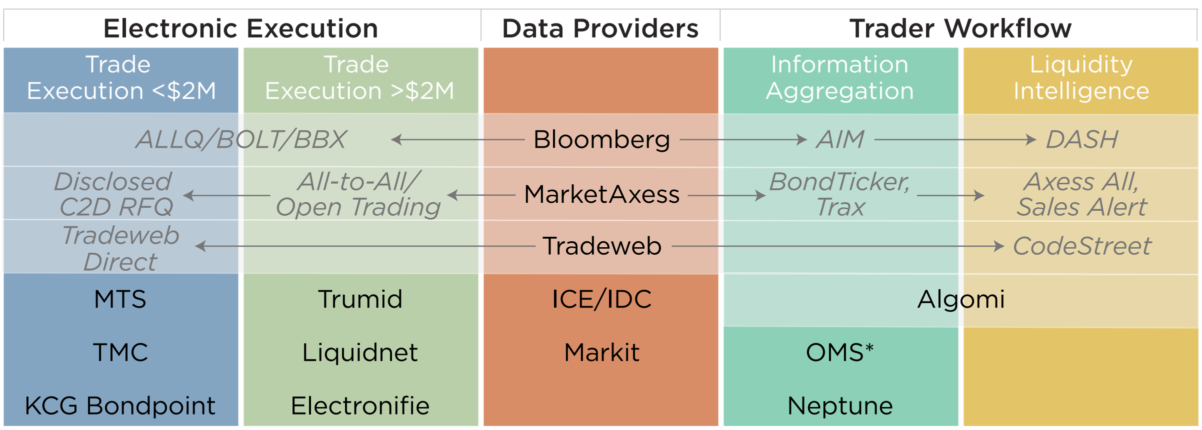
Algomi is a notable player in what we'll call the liquidity intelligence space. Despite a business model that seems like the precursor to building its own trading venue, Algomi has stuck to its strength—crunching the data provided to its buy- and sell-side customers to help the former choose the right broker to call and the latter to create a smarter sales force that can provide clients with new ideas.

Other platforms offer similar liquidity intelligence, but Algomi's platform is currently the only one that provides distinct yet interconnected offerings that benefit both the sell side and buy side. The ultimate goal is to take buy-side best execution from art to science.

The secret sauce for liquidity intelligence is in allowing the buy side to gain access to data on what the sell side is doing. To alleviate sell-side concerns, Algomi has created “safe zones” to ensure only the right people see the right data. Assuming all goes to plan, this approach provides the buy side with unique insight and creates what Algomi refers to as “virtual balance sheet.” Taking this idea one step further, partnerships with Euronext and SIX now allow dealers to interact with one another in a similar manner.

Recognizing the same opportunity, incumbent e-trading providers have come to market with solutions that leverage their systems’ unique data to help primarily the sell side find what they are looking for—even if the trade is ultimately executed away from the platform. MarketAxess built SalesAlert, Bloomberg created DASH and Tradeweb purchased CodeStreet, all with the goal of helping buyers and sellers find their needle in the haystack. We fully expect these offerings to receive continued attention at their respective firms, with the reach and dataset of each expanding in light of the potential opportunity.

CORPORATE BOND TRADING TECHNOLOGY ECOSYSTEM



Note: *Charles River, Fidessa, Flextrade, Portware, Aladdin, and others.
Source: Greenwich Associates 2016

Additional data provided by Algomi suggests that the buy side is looking to liquidity-intelligence platforms to help with larger, less liquid orders. In February 2016, just shy of 7,000 inquiries from the buy side to the sell side, with a combined notional value of roughly $54 billion, would suggest an average inquiry size of roughly $8 million. What percentage of those inquiries resulted in executed orders isn't completely clear, however.

The challenge to these liquidity-intelligence providers is immense. They must first find and aggregate all of the data available on the particular bond and client. Pulling TRACE or TRAX execution data is one thing, but electronically logging phone calls to a client, including the context of the conversation along with dozens of other potential intelligence points, is no small feat. Although most calls on a trading desk are recorded, pulling out the salient points and injecting them into a system that can look for patterns in the interactions requires several technology and compliance leaps.

Even with an extensive data set in hand, the next task is to generate recommendations the trader can actually act upon. This is where terms such as "big data" and "machine learning" come into the conversation—historically not standard bond-desk topics. Even with recommendations in hand, the toughest hurdle for all bond market participants is systematically acting on the recommendations of the platform. For a sell-side sales desk, this might be whom to call, about what and when; for the buy side, reaching out to a less-obvious counterparty to execute a trade quickly and with limited impact.

Conclusion

This is where the story comes full circle. Investors continue to express frustration with executing larger trades, particularly in less liquid issues. This is the problem receiving the most focus from the execution venues and liquidity-intelligence platforms that work to match buyers and sellers, and the data providers and aggregators hoping to grease the gears. The two biggest approaches taken are opening up the pool of potential buyers and sellers (often in the form of all-to-all trading) and mining data to create a view into the location of every bond in the world.

The former is a very logical step and is proving successful in its early days. The latter is a much more complicated undertaking, but arguably a more impactful approach over the long run. If Uber can upend the taxi business without owning any cars, it might be possible for a complete data set with the right intelligence to create a virtual balance sheet without having one of its own. As such, putting the two together should take us a long way toward a more fluid secondary market.

These ideas can and should expand beyond corporate bonds as well. Mortgage-backed securities, asset-backed securities and other relatively standard yet illiquid instruments could also benefit from an electronification of the matching process—even without a move toward full electronic trading.

With very few public companies in this space, revenue data is hard to come by. But given MarketAxess' perpetually rising stock price and the $30 million of venture funding raised by Algomi in the past few years, clearly not only bond investors see value in these emerging solutions. So while traditional electronic trading of corporate bonds in the U.S. could top out at roughly one-third, the opportunity via liquidity intelligence has much further to run.

Greenwich Associates research continues to find and emphasize the value of relationships in the capital markets, and this case is no different. But relationships can be improved with better information and more efficient means of connecting.

The volume of available opportunity is bigger than it's ever been, but the transfer mechanism is broken."

~U.K. Hedge Fund

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