Buy-side implementation of FIX in fixed income

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We are assuming that you already have the green light to embark on this exciting journey of implementing FIX for fixed income. Congratulations. In this article, we hope to point out some of the challenges and to provide you with some tactics for successful implementation.

What is STP in fixed income?

Using the web interface provided by your fixed income ATS is not STP. Even if it can communicate electronically with your systems, it is only one small piece of the puzzle. An ATS's web interface may provide your traders with the means to execute a trade with the broker/dealer and have that confirmed trade information pop up on the web GUI, but that's not STP. Why not? Because your traders (or their support staff) will still have to manually re-key that confirmed trade information into their trading application/blotter system so that post-trade processing can occur. However, with a little bit of integration work, that manual re-keying can be eliminated. How? Have the ATS send the trade information electronically into your system so the traders can view it on their application/blotter. That transfer of trade information from the ATS into your system can be done using FIX. Unless there is an error in the trade information, your post-trade workflow can begin with your traders sending the block allocations to the broker dealer electronically using FIX. The broker dealer in turn can confirm the block using FIX. This is the start of fixed income STP, albeit a small step. By removing the need to re-enter trade data, FIX is a tool that aids in any firm's STP initiative. The front-office automation provided by FIX reduces errors in the trade information needed for middle and back-office operations.

What are the challenges of implementing FIX for fixed income?

Scoping the project

The decision of 'where to start' is the first challenge you are likely to face. Which aspect of the trade life cycle you decide to FIX-enable first, as your 'getting to know FIX project', will depend on what your firm is ready to do. In the past one to two years, we've seen two main approaches: go after the area of trading operations where there is the most

FIX 4.4 and fixed income

With the release of FIX Protocol version 4.4 in mid-2003, the protocol is ahead of current fixed income business usage. FIX 4.4 is the first version to officially provide robust support for fixed income data elements. In terms of business flows, FIX 4.4 provides support for communicating inventory, axes, quotes, negotiation dialogues, order and execution dialogues, block level allocations, account level confirmations and affirmations and collateral management. Specifically, FIX 4.4 supports the following fixed income assets: US Treasury and Corporate Bonds, Municipal Securities, Agency Securities, Euro Sovereign and Corporate Bonds, US and Euro Commercial Papers, To-Be-Announced (TBA) Mortgage Backed Securities, and Repurchase Agreements (Repos) and Related Securities Lending Activities. FIX 4.4 is an enabler for fixed income STP. It enables you to 'talk' to your counterparties using a proven standard protocol that has been embraced by equities trading operations for the past ten years. It also eliminates the high cost of having to deal with proprietary messaging interfaces.

'pain', or experiment with a small step that does not cause too much disruption. Which approach you take will depend largely on how you've sold the idea to your traders and your firm's tolerance to change. Some of the first implementations of FIX in the fixed income space started with receiving FIX Execution Report messages as trade confirmations from ATSs. By taking in FIX Execution Report messages you've enabled the possibility for two things to happen: 1) eliminate the need for traders to re-key trade confirmations into your trading system, or 2) add the ability to match your counterparty's view of the trade with your trader's view of the trade. Whether you gain one, or both, of these results depends on your internal architecture and trading system capabilities. This is a manageable first step to get your feet wet with FIX. The next logical step could be streamlining block allocation and confirmation or sending FIX orders. Eliminating the need to use means such as fax, phone or email to confirm trades and communicate allocations eliminates re-keying errors on both the buy and sell sides. The main objective is to take incremental steps that show results as to what FIX can do to lead you to reduce trade errors and breaks in your downstream operations.

Security identification

As you continue along this journey, other challenges will surface, some of which you may have anticipated, others you may not have thought of. One of the first issues you are most likely to run into is security identification – a big challenge with fixed income trading in general. Liquid securities, such as Treasuries and agencies, are easily identified through 'live' CUSIPs. The challenge lies with primary issues for securities such as TBAs, CPs and corporates that may not have 'live' CUSIPs even when the issue is initially being traded. How do you know that you and your counterparty are talking about the same security if there is no 'live' CUSIP? You'll need several identifying parameters in order to help you 'match'. Possible data includes the issuer's six-digit CUSIP that could be used as a preliminary identifier, descriptive information on the security, such as maturity date, coupon rate, issuer's name, security type, etc. Even then, this isn't perfect. Your traders are likely to have to be involved to confirm that it is the correct security when your system is not able to ascertain an exact 'match'. Security identification, especially for primary issues, in fixed income is a topic unto itself, but it will affect your electronic trading efforts today. This is a problem that will require co-ordinated industry efforts to address.

Real-time trading environment

Further along this road, you will notice that you are increasingly dealing with a real-time trading environment. A real-time trading environment requires you to think differently about how your architecture is designed in order to deliver real-time trade information to your traders. It means a real-time messaging environment, a real-time trading blotter that can handle state management of orders and allocations, an infrastructure that can support this, software solutions with more business rules and intelligence 'built in', and additional levels of systems and trading operations support. However, you need not be alone on your journey. Real-time trading environments have been a reality on the equity side for many years now. It is an opportunity to learn from your colleagues on the equity side of the business and to talk seriously about leveraging some of the common infrastructure, a cost containment move, that can be shared across your firm.

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How does this affect your traders?

The main benefit of FIX 4.4 and enabling electronic trading for fixed income is an increase in your traders' efficiency in doing their job. This is true for both buy-side and sell-side traders.

Real-time trading means some changes to your traders' workflow and work habits. Educating your traders on what is changing as a result of electronic trading is a must. Document the current workflow as your baseline, then document what will change as a result of enabling electronic trading. Get your traders involved early on and let them have input into the changes that will affect their workflow. It is imperative that your traders understand the changes to the user interface, if any, and any system behavioral changes as a result of enabling electronic trading. Error messages that the system provides because of electronic trading should be explained to the traders.

As each piece of the trading workflow is enabled for electronic trading, your traders will quickly realise that they have to deal less with the clerical aspects of their job. With

that 'freed up' time, they can look for opportunities, and come up with new trading strategies. It also means that they are much more likely to be able to buy the inventory they wanted at a faster pace than their competitors who are still relying on phone calls and faxes.

The tactics

Get to know your peers on the equity side of the business

Now that you know that you want to take this journey, it is time to talk to your peers on the equity side of your firm. Most likely they are already using FIX and have a few lessons they can impart. The barriers, perceived or otherwise, between fixed income and equity operations and technology groups need to come down. Equity has gained tremendous knowledge and experience with STP, FIX and electronic trading in the past ten years. Leverage their knowledge and those of others who have experience in this area. The markets may be different, but the technology is easily transferable to fixed income. Help the technologists understand your business. It is a two-way street that is a win-win situation for you, who know your business, and for the technologist, who knows FIX and e-trading and can help you get up and running faster than you can if you were to have to figure this out yourself. Work with experienced people who are willing and able to also impart their knowledge and educate your staff on FIX and e-trading.

Leverage existing infrastructure

If your firm's equity desk is already engaging in electronic trading and FIX then your firm already has a FIX-capable infrastructure in place. You need to learn what is already there and ask whether you can leverage that infrastructure. A FIX infrastructure is expensive, but it is something that can be leveraged and co-ordinated company wide. Very likely many middle and back office systems are already shared across the different trading desks of your firm. There is no reason why the FIX infrastructure should not also be shared. Firms that are progressive will eventually build a common FIX infrastructure and provide a messaging component as a common service to all of their different trading desks. This is where cost savings can be realised by the firm in terms of software licences for the FIX engine, databases for persistence and data recovery, and the external network access for communicating with counterparties.

There are a number of reputable FIX engine vendors with engines that integrate with legacy or custom order management systems or databases. Most support FIX 4.4 already. These FIX engines either come with a vendor order management system, or will easily integrate with your system through TCP/IP sockets or other messaging middleware such as MQ Series, Tibco Rendezvous, COM, Corba or other transport interfaces.

Although the order management system vendors have the most work to do, they are rapidly catching up to market demands for support of fixed income electronic trading capabilities.

There are IP network vendors who have considerable FIX experience in connecting up the buy-side and sell-side worldwide in the equities world. Fixed income presents no new challenges for them. Three network connectivity models are offered today:

1) Point-to-point – this requires individual leased lines between you and your counterparties. Under this connectivity model you will be able to open up one or more FIX sessions to the counterparty at the other end of that leased line.
2) Virtual private networks – these allow you to reach multiple counterparties without having to manage the leased lines yourself. The VPN provider would do that. Similar to the point-to-point mode, with this connectivity model you will need to open up a distinct FIX session for each counterparty you wish to 'talk' to.
3) A managed hub-and-spoke model – this model allows you to reach multiple counterparties using a single FIX session to the hub-and-spoke vendor. Typically the vendor will also provide the leased line between you and the vendor and will manage it as well.

These connectivity models already exist and are in use in the equity space. It is a cost advantage for you to discuss with your equity peers as to what they're using and how you can leverage what is already in place.

The human resources needed to support such an infrastructure can also be shared. Firms with a large infrastructure, especially globally, should consider forming a

group who will support this infrastructure across the firm. From a support perspective, it is all the same no matter what asset type is being traded.

Build scalable systems

At the start, FIX was small. Five years ago, a client of ours, an asset manager, was supporting FIX 4.0 for equities, connecting to five brokers and supporting order and execution messages. Today, they are running some FIX sessions in 4.0 and others in 4.2, with connections to 80 brokers, supporting indications of interest, order, execution and post trade allocation messages. Program trading has become more and more important to the asset manager, putting significantly more stress on the systems. The actual number of messages sent and received in a day is estimated to have gone up 100x. The asset manager's in-house built FIX engine and trading system were not able to scale up to this amount of messages, or performance, and lacked much needed functionality that was not anticipated at the start. The asset manager recently moved from an in-house solution to a vendor solution.

All the indications are that fixed income will follow not only a similar path of increasing importance and benefits, but also complexity. Firms that want to get ahead of their competitors in the medium to long term will invest less in tactical short-term systems, and more in long-term scalable strategic solutions.

Follow the FIX Protocol as strictly as possible

The FIX Protocol has two layers, the session layer, which deals with the connection between parties (log on, log off, sequence numbers, etc.), and the application layer, which deals with the format of the FIX messages themselves. The session layer has remained constant as a standard for many years. Unfortunately, however, some FIX engines have interpreted the protocol incorrectly. For example, one major US exchange uses the raw data field for a logon password and omits the necessary raw data length field. This creates unnecessary confusion, programming and costs.

On the same note, the FIX application layer allows the use of user-defined fields that are agreed upon between two parties. These user-defined tags can be used to communicate any information that the two parties deem necessary to facilitate the dialogue. In equities, the use of user-defined tags is prolific, especially among ECNs. The advantage of the protocol's flexibility with regard to user-defined tags is that it has allowed firms, particularly sell-side firms and ECNs, to be innovative in the services that they can provide. The major disadvantage is having to work with the unique requirements of these user-defined tags. To start a connection with a counterparty, you must first rigorously test to ensure that you are able to communicate with that unique counterparty. This adds significant time and cost to FIX connectivity. In the end, it is a trade-off between protocol flexibility and standardization. FIX 4.4 has sought to be as thorough as possible in order to minimise the use of user-defined fields. We hope that companies use the existing fields as much as possible, and only use user-defined fields where they see significant opportunities to improve the protocol.

The markets may be different, but the technology is easily transferable to fixed income

Conclusion

We wish your well on your journey. The best results will come from those who scope the project correctly, understand existing processes, get traders involved with designing new processes, learn from the equities side, and leverage existing scalable systems and infrastructure. Good luck! **FIX**

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