

European Corporate Bond Trading – the role of the buy-side in pricing and liquidity provision

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Summary

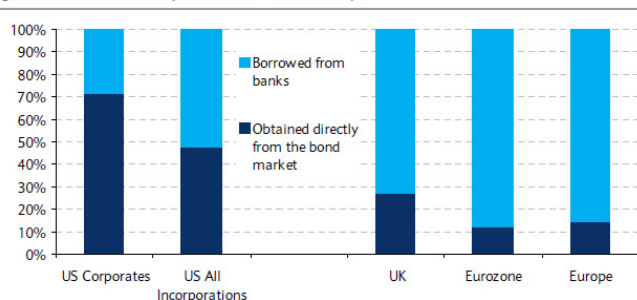
Corporate bond markets are being radically changed by a confluence of factors – new Basel III capital and liquidity rules which make capital facilitation less attractive to dealers, the MiFID II requirements on transparency in bond markets and the availability of innovative new platforms based on equity and FX market technology which claim to offer good liquidity despite a shortage of dealer capital. These factors have already led to a reduction in capital commitment by dealers even in advance of the regulatory implementation of Basel III and MiFID II. The shift from voice to electronic trading and from capital facilitation by dealers to agency facilitation are well established trends but RFQ mechanisms are likely to continue to be necessary due to the clear differences between equities and FX on the one hand and most corporate bonds on the other. A key question is whether the largest institutional investors themselves might now choose to commit capital to liquidity provision to replace that which is being withdrawn by dealers and achieve this by making prices to other, smaller, investment institutions through both order-driven and RFQ platforms. This would result in the larger houses being able to buy at the bid and sell at the offer thereby taking out the spread and, hopefully, generating alpha for their funds.

Introduction

Until recently most regulatory attention and technological innovation in both the US and the EU has been focussed on equity markets. However, while equity markets have changed dramatically in the last 15 years in terms of market structure and consequently in terms of the appropriate business model for market participants, corporate bond markets have not yet made the same leap into the new millennium. Today, all bond market participants – buy-side, sell-side, exchanges and platform providers – are being forced to reconsider their business models as bond market structure changes in response to regulatory and technological change and cost pressures due to declining volumes in some sectors. As an example of this, the 12 month rolling turnover in the US investment grade corporate bond sector is reported to have declined from around 95% of the outstanding stock of bonds in 2009 to around 70% in 2013.

From a macroeconomic point of view, the potential shortage of long-term funding provided by capital markets for both industry and infrastructure has become a concern of governments in both the US and the EU and beyond despite recent increases in bond market issuance. The G30 Report “Long Term Finance and Economic Growth”, published in March 2013, noted that “Worryingly, we conclude that the current systems overseen and designed by policy makers and market actors fail to adhere to such best practice principles and therefore may do a poor job in supplying long-term finance...” This Report emphasises the need for more financing to be undertaken through debt capital markets rather than through fragile banking systems and for more bank-originated debt to be securitised and sold into the capital markets rather than held on (fragile) bank balance sheets. The current sharp divide between Europe and the US in respect of sources of debt is evident from the graphic below. This divide does, of course, give enormous scope for European corporate bond markets to expand and to dis-intermediate the banking system in respect of much corporate debt if the US financing pattern is eventually replicated in Europe.

Figure 10: Sources of corporate debt – US vs Europe



Source: Federal Reserve Board, ECB, Bank of England, Barclays Capital

The Report does not, however, go into detail about bond secondary markets. These details are important as secondary market structure determines transaction costs and liquidity for investors and hence impacts the primary market yield that corporates must pay to attract investors to buy their bonds. We have chosen,

therefore, to contribute to an understanding of bond, and in particular EU corporate bond, secondary markets by considering how changes in technology and regulation may impact this sector. High spreads, high broker commissions, absence of straight through processing and difficulty in transacting in size all add to the required yield on corporate bonds and hence increase the cost of financing for companies. Ensuring cost efficient functioning of secondary markets thus contributes to the G30's objectives for corporate bond and securitised loan primary markets and hence for economic growth.

We look first at changes in equity market structure over the last 15 years and compare today's equity market structure with today's bond market structure. From this we hope to understand how bond market structure may change and whether such changes are likely to support investor objectives and also the G30s objectives. We also comment briefly on FX markets which were the first OTC markets to shift in substantial part from voice to electronic.

How Equity Markets Have Changed

Equity markets worldwide are dramatically different today than fifteen years ago. The UK equity market in particular made a very sharp shift in market structure at that time from what was until then a pure dealer market. It only switched to using an electronic order book (OB) offering limit and market orders in 1997 in contrast to continental European markets which had used limit order books and auctions for many years and where the dealer model, although used by dealers for some institutional trades (often reported through SEAQ International at the LSE), was not the generally accepted trading method.

The shift in London from OTC dealer to order-book structure was driven by regulatory and technological developments which resulted in further dramatic change in market structure not only in London but in continental Europe, Asia and the United States. In London in particular, it was the introduction of tight post-trade transparency rules that probably killed off the dealers. Instead of dealing in size with institutions and working the orders (in effect breaking down parent orders into many smaller child orders), with end-of-day reporting, dealers were forced to report the trades intraday within much shorter time spans. This trade-off between post-trade transparency and market liquidity in which transparency would be said by many to 'have won the battle', may indeed have made the equity market much more volatile intraday (but not necessarily inter-day) and perhaps less liquid, thus driving a huge growth in equity derivatives.

This revolution was enabled as a result of the acceptance by legislators and regulators of the potential benefits of competition in trading services (resulting in Reg. NMS in the US and MiFID I in Europe) despite the known benefits that can arise from retaining a single central limit order book (the traditional stock exchange in a country) and the known disadvantages of possible fragmentation of the market arising from multiple execution venues. The change in market structure to competing execution venues now permitted by regulators was facilitated by the continual improvement in, and reduction in cost of, technology that allowed new entrepreneurially-driven trading venues which operated at much higher speed yet at much lower cost than the more bureaucratic stock exchanges, to be set-up. These were able to offer lower trading fees, higher trading volumes and faster trade execution.

In markets such as London the equity execution platform prior to 1997 was the voice-based dealer located in the large investment banks. As we entered the new millennium, these dealers were mostly replaced by High Frequency Trading (HFT) houses such as Optiver, IMC and GETCO operating on new multilateral platforms in which the HFTs were shareholders. But unlike the investment bank market makers of old who would quote in large size, these new liquidity providers were only willing to offer liquidity in much smaller trade size. Doing this reduced their loss if they were picked-off by better informed traders. After a losing trade it was possible to cancel any other limit order sitting on the order book and, within microseconds, to replace it with one at a new price. This minimised the risk of subsequent loss if the same trader came back to execute more trades on the same side. In consequence of this lower risk, these liquidity providers could offer tighter spreads than the dealers of old were able to offer. To enable large institutional orders to be executed, however, the buy-side now had to break down large 'parent orders' into 'child orders' (either themselves through an order management system or through a broker) as part of their order placing strategy and seek out liquidity on multiple execution venues. Thus institutional-sized trades became harder to execute and required the use of multiple venues and multiple tickets.

The decline in average ticket size since the new era began is one of the most obvious changes in market structure. In FTSE 100 stocks, for example, the average trade size in 2012 was only £6000. Even in 2011 it was £7,800 but a decade before in 2002 it was £60,000. In the US, a recent Blackrock report noted that block trading (10,000 or more shares in a single trade) now accounts for only 7% of total S&P 500 trading volume down from nearly 50% in the early 1990s. One consequence of the new way of trading is that in the US, for example, the explicit cost of trading on a per share basis has fallen dramatically from around 15 cents 30 years ago to about 1.5 cents in 2011. Such reductions have encouraged greater portfolio turnover by asset managers but may not have resulted in improved returns for investors.

Once the market moved to smaller trades at tighter spreads on the new electronic order book platforms, the need for inter-dealer brokers virtually disappeared. There was no longer a need for a separate type of firm to break-up large orders and distribute them in smaller pieces amongst multiple dealers. This was now being done by the Smart Order Routers (SORs) and execution algorithms used by Order Management Systems (OMS) and Execution Management Systems (EMS) of the institutional investors themselves or their brokers. In addition, since the new platforms used virtually the same technology as the IDBs – the order book –there was much less need for a separate class of intermediary simply for dealer-to-dealer trades.

The new equity platforms that developed to compete with the traditional exchanges followed on from developments in the foreign exchange market. In FX, electronic trading platforms were developed for the interbank market by EBS and Reuters in the late '80 and the '90s. Later, web-based electronic platforms, open to a broader range of market participants, in particular retail, became available. Today in spot, many electronic intermediaries now exist which provide streaming liquidity from competing banks in order to offer clients 'best execution'. A particular innovation in the equity market context was the introduction of a new fee structure. The most valuable order-type for a platform, particularly for a new platform trying to attract orders, is the limit order which provides liquidity to market orders just as a dealer quote did in the old market structure. The new MTFs in the UK such as Chi X (now part of BATS) which started operations in 2007, offered so-called maker/ taker pricing. They charged a fee to those who took liquidity (the aggressor placing a market order) and instead of also charging the providers of liquidity (the passive side which placed a limit order) they rebated around 2/3rds of the fee paid by the aggressor to the passive side. This provided the HFT market makers with an additional source of income to add to the spread they were taking out and thus encouraged them to provide liquidity. In addition, algorithmic trading, in effect artificial intelligence, became the norm and thus not only were the liquidity providers automating human traders out of the market making function, institutional investors were also automating both traders and brokers out of trade execution.

However much we may look to the equity market or the FX market as models for the development of the corporate bond market, we have to acknowledge the differences, indicated in the graphic below, by the difference in the number of securities (much larger in bonds) and number of trades (much smaller in total in bonds and even smaller per bond) than in equities. In spot FX, the contrast with corporate bonds is even greater since the numbers of 'securities' in spot FX is very small indeed and thus the volumes traded in the major currency pairs such as US dollar/ euro, are enormously greater than in corporate bonds. Statistics provided by MarketAxess suggest that in the US, out of 30,000 investment grade corporate bonds, only 20 see more than 10 executions a day. This low turnover is due in large part to bond investors generally being 'buy and hold' and therefore not requiring liquidity rather than being due to issues related to market structure.

Worlds Apart

	Stocks	Corporate Bonds
Total Market Value	\$17 trillion	\$8.1 trillion
Estimated Listings	6,500	40,000
Average Daily Trades	25.2 million	40,280
Average Daily Volumes	\$112.9 billion	\$17.9 billion
<i>(Source: SIFMA, MarketAxess Research, TABB Group)</i>		

Will change in wholesale bond market structure parallel that in equities?

In contrast to wholesale markets, retail bond markets are already relatively liquid and operate in a similar way to equity markets as they use an OB platform for trading. However, transaction costs for retail investors in bonds, particularly after including broker commission, are generally much higher than in equity markets. Wholesale bond markets on the other hand mostly retain the OTC dealer structure (whether voice or electronic) as we note below and have, at least until now, conformed to a quite different model than equities. In wholesale bond markets:

- There has never been a central concentrated, 'national stock exchange' model, in bonds. Instead there has been a 'competing dealer' model with each dealer offering different 'markets' in the same bonds but with linkages through inter-dealer brokers and screen quotations
- There has been no order book (OB) trading
- The 'Request for Quote' (from client to dealer) model has been the standard method of trading. Originally by voice, today through multi-dealer platforms (MDPs) or single-dealer 'portals' (SDPs)

- Trading has always required full disclosure of counterparty before the trade or 'name give-up' after the trade, not anonymous trading as in OB trading of equities
- There has been no use of central counterparties
- Straight through processing (STP) has not been extensively used as without electronic initiation of trades, the trade must, at least initially, be handled manually
- Institutional trade size has generally been very much larger than in equities
- In the European Union, MiFID I requirements on pre and post trade transparency did not apply in bond markets though MiFID II requirements, for both pre and post trade transparency, will apply in future to most bond transactions

Thus bond markets have always been mainly voice rather than electronic (and thus trades are recorded manually) and also principal i.e. proprietary rather than agency.

In trying to determine if bond markets might eventually follow the new equity market structure and whether this would be beneficial, we can go back a few years and observe a pattern of new technology in both bond and equity markets that was originally rejected by market players, subsequently taking hold and becoming the established way of trading. Back in 1979/80 for example, a new electronic bond trading system came into existence. This was the Eurex multiple dealer platform (MDP), request-for-quote (RFQ) bond terminal – not Eurex, the German futures exchange! When an institutional investor sought a quote, a bell would ring on the terminal telling dealers that an investor wanted a price. This new platform was quickly killed stone dead by the large broker/ dealers who realised that it would allow small trading houses such as Ross & Partners, a new private eurobond trading house, to compete on equal terms with them and that this would lead to a loss of business and tighter trading spreads. Today, of course, electronic RFQ systems such as MarketAxess and TradeWeb are well established.

Around ten years later the London Stock Exchange tried to introduce what eventually became the Stock Exchange Electronic Trading Service (SETS) which is an electronic order book (OB) platform. That too was stopped dead in its tracks for nearly a decade, by the same large broker/ dealers. One of the senior people in one of those investment banks said at the time that they would never allow the stock exchange to become a competitor to them which, of course, they could prevent as at that time they owned the exchange. The frustration of those who had developed the SETS technology but not been permitted to make it operational resulted in them leaving the LSE and setting up Tradepoint, the first order-book based, equity multilateral trading facility (MTF) in Europe using essentially the SETS technology and competing with the LSE. Unfortunately, official inertia (best execution requirements did not require a broker to check prices on Tradepoint, only on the LSE) was designed to ensure that the new venue never succeeded in providing any real competition to the LSE. It took until 1997 when the LSE became a quoted company, for it to be able to make the shift from a dealer market, the Stock Exchange Automated Quotation (SEAQ) system, to the SETS central limit order book platform. Today, of course, we have many MTFs in London equities all competing strongly with the LSE. The question we would like to answer, therefore, is whether or not bond markets will eventually follow this shift from RFQ to OB and to a proliferation of competing venues, smaller trade size, algorithmic trading and a need for liquidity aggregation technology. Quite apart from the fact that the higher regulatory capital and liquidity requirements of Basel III mean that capital commitment models of trade execution will become more costly to operate, the on-going desire to cut costs in the large broker/ dealers makes electronic trade initiation and hence the possibility of full STP, very attractive.

What are the possible market structures for bond trading?

To try to answer these questions we need to consider the features of the two extremes of market structures, the request-for-quote (RFQ) model and the order-book (OB) model, in more detail:

The RFQ (quote request on one side of the market) / RFM (request for prices on both sides of the market)/ RFS (request for stream i.e. continually updated prices which may be firm or may be prices where the dealer has the 'last look' before agreeing to trade) model can function using either voice (telephone) or electronic connection between trading parties. MarketAxess, for example, is essentially the traditional RFQ/ RFM voice model translated to an electronic environment. A key difference however is that this model allows a client to access multiple competing dealer quotes at a single point in time rather than sequentially as is necessary on the telephone. This is an improvement, from the investor point of view, on the old voice request model and is more likely to provide 'best execution' and tighter spreads. Indeed, it may result in the multiple dealer-to-client (MD2C) platforms having such tight spreads that it is difficult for an IDB to create an 'inside' market at tighter spreads as has happened in equities. However, at least a third of requests to multiple dealers for a quote are said not to generate any dealer quote (phantom liquidity). Thus in the RFQ model the prices on screen are often indicative and not firm and executable. In addition, in this model, traders on both sides are always aware who their counterparty is.

The OB model as used in equity markets worldwide enables traders to post *limit* orders – bids and/or offers – anonymously on the order book and/or they can hit the bids or take the offers by placing *market* orders. On such platforms there may also be ‘liquidity providers’ who have market-making obligations just like voice market makers of old (today known as Designated Market Makers or DMMs) who are obliged to provide a minimum size of both bid and offer during market opening hours. In the OB model, *prices are always firm and executable* whereas with the dealer model, prices on screen may or may not be executable. It is also a key feature of this model that traders do not know who their final counterparty is. Generally, the ‘intermediate’ counterparty is the central counterparty (CCP) which novates trades and this is what provides anonymity.

These two models are often considered to be polar opposites on either side of a great divide. But a key question is whether or not an OB is, in principle, so different from an RFQ/RFM/RFS platform. In equities the OB is used by the ‘new’ dealing community of high frequency traders (HFTs) to enter their bids and offers thus providing pricing services (price makers) and liquidity just as the dealing community of old did. Thus dealer facilitation in equities has not disappeared – it has simply changed in nature – dealers no longer shout down telephones, their quote sizes are smaller and they may quote on one side only. Since in any market, regardless of market model, there must be a price maker (the passive side, traditionally a dealer) who today is the limit order side of the market and a price taker (the aggressor, traditionally the institutional investor) who is the market order placer, in fact OBs and dealer platforms function in a similar way.

There are, however, a number of key differences:

First, as we noted above, on an OB the identity of those who provide quotations and also those who hit or take the bids and offers are not disclosed pre or post trade. Thus these systems don’t allow an electronic dealer to build a reputation with customers for ‘always providing a price and a good price’ and thus make it easier for non-DMMs to be a ‘fair-weather market makers’. On an RFQ platform in contrast, names are known on both sides before the trade and thus maintaining reputation for consistent liquidity provision and good pricing is important.

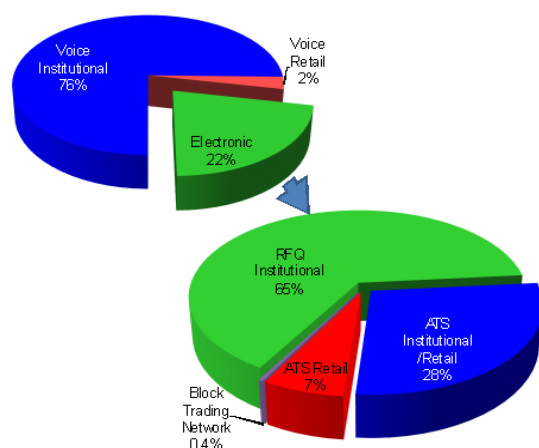
Second, while RFQ platforms have indicative prices on their screens, when an RFQ is entered by a client, there may be no liquidity offered or it may be at a worse price than indicated on the screen or, what seems to be a firm price may be subject to ‘a last look’ by the dealer before confirming the trade. On an OB system, in contrast, anyone can ‘Click to Trade’ against firm prices. Thus the truly tradable (click-to-trade) price versus the possibly tradable price is a key difference between the two models.

Third, is the fact that only the dealer can place limit orders in a quote/ dealer/ OTC market whereas in order book trading, any trader including an institutional investor can place a limit order (if the rules of the platform permit) and thus be a liquidity provider instead of a liquidity taker.

Fourth is the small size of quote that the new breed of DMMs is willing to commit to on an OB platform which distinguishes them from the old breed of voice-based dealers. They do this, as we noted, to minimise the cost of being picked-off by better informed traders. Small trade size also minimises inventory risk when markets as a whole move up or down. HFT dealers and DMMs unlike traditional market makers do not hold positions overnight unless they are taking a view (unlikely) or are ‘short and caught or long and wrong’. They like to close the day with a flat book. Thus they are unlikely to be willing to take large positions onto their own balance sheet.

Today in the bond markets, the traditional broker/ dealers have *also* become much less willing to hold large positions on their balance sheet, overnight or for longer periods. This results in large part from Basel III capital and liquidity rules even though these are not yet fully in place. ‘Client facilitation’ has become more expensive. The new capital rules require much more capital, perhaps four times as much as before, to be posted against trading book positions and the new liquidity rules disadvantage overnight repo financing which makes inventory holding more costly. In the US we also have Dodd-Frank and the Volcker Rule and in the EU, MiFID II, MiFIR and the FTT (which we consider in the final section) which give rise to further issues for market making.

The graphic below, courtesy of Tabb Research, shows in the upper graphic the relative proportions of voice and electronic trading the US corporate bond market as a whole. The lower graphic shows that within the electronic trading sector, in terms of volume RFQ still dominates the institutional (large trade size) market while Alternative Trading Systems (ATs), principally OBs, execute most of the balance (though much of that is retail). Order matching of the type offered by Liquidnet in equities (Block Trading Network) is currently a tiny 0.4%.



Can the buy-side make prices?

We have noted that in dealer markets, only dealers can provide quotes i.e. enter limit orders for others to trade against whereas in order-book markets any trader accepted on to the system can enter limit orders and can thus potentially offer liquidity to other traders (by being a price maker). As a result, whereas we once had a clear distinction between price-makers (OTC dealers) and price-takers (buy-side), in electronic order-driven markets dealers and buy-side are, in terms of the types of order they may enter, no different from each other. On platforms which are 'All-to-All' (A2A) both can enter limit orders i.e. bids or offers as well as market orders i.e. make or take prices. In terms of technology, the same applies to RFQ-type platforms. On an A2A RFQ platform, institutional investors can equally well be price-makers by responding to requests for quotes. All that is required is that the platform permits All-to-All trading rather than being Multiple Dealer-to-Client (MD2C) only. Thus the distinction in markets between dealers and buy-side investors is a conventional, or rule-based, one rather than a technological one. It is also, of course, a distinction that is deeply embedded in the psyche of those who have long worked in the markets.

The skills required to price securities and the short-term trading skills and technology that would be necessary to execute orders and hence compete with HFT market makers if they enter bond markets are very different from those of the traditional institutional buy-side trader whether in equities or bonds. It requires a different type of person. Will institutional bond investors enter the market as 'dealers' i.e. putting in limit orders (bids and offers) or be willing to respond to RFQs rather than just always entering market orders into an OB or requesting a quote or 'the market' from dealers? Will they, in fact, become contributors to quotes on RFQ/ RFM/ RFS systems which some platforms such as MarketAxess are experimenting with? The key difference between large cap equity markets and debt (apart from some sovereign or large corporate) markets is that we don't currently have pre and post trade price transparency thus making prices is difficult, nor do we have low latency HFT-type connections from the buy-side to trading venues resulting in price-making being riskier.

Some firms in the US market have developed statistical pricing, 'fair value' models, to price bonds including those that rarely trade. If such a pricing model can prove to be effective (some have failed to achieve commercial success), there is less need for market pricing and we might expect the buy-side to become more willing to trade using limit orders rather than market orders even in less liquid bonds. That would certainly be a breakthrough by facilitating trading without the need for continuous price discovery in market transactions. We have to be aware, however, that when prices are not from market transactions but from a 'model' or from a 'fix' they may be biased in some way. The issue of 'benchmark' prices in the LIBOR and ISDAfix markets where prices are said to have been manipulated is a warning against a regulatory requirement for 'prices' to be provided pre-trade when there *is* no market. Nonetheless, disclosure requirements under MiFID II could increase transparency in EU markets to a level greater than in the US since pre-trade transparency is also required under MiFID II whereas in the US, TRACE requires only post-trade transparency. Sensibly, there will also be waivers on publishing pre-trade 'prices' for illiquid bonds without recent transactions as well as delays for disclosure of post-trade execution for large trades which MiFID categorises as Large In Scale (LIS) trades.

Why the buy-side might make the best liquidity providers

Corporate bond dealers in the US are said to have reduced their corporate bond inventories from a level of around \$250m in 2007 to only around \$50m in 2012. With so little inventory and the cost of holding that inventory so much higher in terms of capital, the new environment is one in which balance sheet facilitation of client trades is clearly less attractive to broker/ dealers relative to agency broking than in the past. For many

broker/ dealers, riskless agency facilitation for a commission would be much more attractive than risky price-making for a spread.

Since institutional bond investors hold more than 99% of the inventory of all bonds their inventory is a natural source of liquidity to be used as an alternative to the now greatly reduced inventory on broker/dealers' balance sheets. Their reward would be to take out the spread instead of paying the spread. Making prices does, of course, present a risk of losing money by getting the price wrong or having unwanted positions. However, a buy-side firm's inventory rises and falls in value whether or not it offers liquidity services but the gains and losses do not accrue to the buy-side firm. Instead they accrue to fund investors who have knowingly accepted price risk and who are invested in what is normally an unleveraged fund. In contrast, broker/ dealer inventory value changes accrue to its own bottom line. As broker/ dealers are highly leveraged such changes, if they are losses, can easily put them into negative net worth. Their trading books are also highly 'maturity mismatched' since they are financing what may be long-term bonds with overnight repo.

If the buy-side offered liquidity services successfully the private benefit to them would be that they could potentially generate alpha for their funds. The public benefit is that a shift of liquidity provision from highly leveraged firms to unleveraged funds would have systemic benefits. This is because in contrast to broker/ dealers, fund managers don't have to re-finance their long maturity inventory every day in the overnight repo market and thus don't have to bear the risk of not being able to roll-over repo during a liquidity crunch. Nor need they concern themselves with collateral or haircuts. They are also not subject to the Basel III Liquidity Ratios which also raise the cost of broker/ dealer market-making. Since their portfolios are already funded by their fund investors (in effect 100% equity financing by ETF and mutual fund unit holders or pension fund policy holders) such investment institutions may be better placed to provide liquidity to each other than are highly leveraged intermediaries. Thus a partial transition from broker/ dealer to buy-side liquidity provision would be likely to reduce systemic risk.

In the primary bond markets, *traditionally* new issues involved the managers buying the whole issue from the corporate before it had been sold to investors thus the managers took on price risk prior to distribution. Broker/ dealers (investment banks) were therefore committing substantial funds (hence regulatory capital and appropriate funding) to the distribution process which under the new Basel regulatory framework would become much more costly. An alternative would be for the buy-side to work with the sell-side by joining distribution syndicates themselves and acquiring their positions directly from an issuer so that the investment bank new issue manager would be undertaking only pricing and issue management rather than also providing capital commitment. As in direct buy-side participation in the secondary market this would allow institutional investors to buy at the syndicate buying price (bid) rather than at the syndicate selling price (offer). It would, of course, mean taking on a different role and taking on additional risk but in a similar way to institutional equity investors in London where they participate as new issue sub-underwriters. But for those that undertook these activities successfully, it would be likely to be one of the few ways of successfully generating alpha.

In practice, in some markets and in particular in what was the eurobond market in London (the market for dollar issues outside New York) the 'underwriters' have managed to change the underwriting system from one where they are at substantial risk on a new issue (the bought deal or fixed price deal) to one where inventory price risk for the broker/ dealer has been all but abolished by ensuring that an issue has been 'bought' by institutional investors prior to launch. Before the year 2000, underwriters bought the whole issue from the corporate at a discount from par and then sold it on to their clients for whatever price they could realise. Later this was modified to the 'fixed price re-offer' method whereby the re-offer to clients was supposed to be at a price set by the lead manager and not below. Under both systems, underwriters often lost money by having to sell the issue to their clients at a lower price than they had paid to the issuer. Today, the so-called 'pot' system is employed. Only when sufficient orders have been collected to cover the whole amount of the issue (the book), will the deal be finally priced. Bonds are then allocated to clients of all underwriters by the 'book-running lead manager' or managers. Only at this point, when there is virtually no risk of loss, do we have 'launch'. In other words deals are no longer launched until they are already placed i.e. effectively bought by investors. So the underwriting risk has largely been taken away from the dealers.

In the same way as investment banks have returned to their historic role of agency facilitators in new issues by just arranging and pricing a deal without true underwriting, so too in secondary markets we may see a move to agency facilitation through single dealer platforms (which we explain below) which then access competing quote RFQ platforms and OB platforms. Regulation that makes risk bearing more expensive combined with technology that can eliminate expensive (and risky) human traders and enables STP may allow the investment banks to shift a considerable proportion of their client trading business from principal to agency facilitation, from spread to commission.

The Marketplace Today and Tomorrow – Multiple Dealer Platforms (MDPs) and other models

The dominant electronic multi-dealer platforms such as MarketAxess, Bloomberg and TradeWeb use RFQ, RFM and RFS trading protocols. But they could equally easily also offer limit order book trading if that was wanted by clients. What seems to be happening just now is that a number of new execution models which are a variant on what we have already had for some time are being offered to try to discover the ideal platform protocols. We consider a number of these new models below.

MarketAxess. An MDP in the US and Europe, in the US has 85 market makers providing prices on its system. On the other side of the market it has 1000 institutional investors. They can transact with each other on the Client to Dealer platform. But in addition, through what they call 'Open Trading' which they are developing, any trader whether a dealer or institutional investor can enter orders i.e. limit orders. Alternatively they can respond to Requests for Quotes from other institutional investors. Such a system should, in theory, maximise the possible interactions between pools of liquidity i.e. A2A.

Tradeweb Markets, an MDP provider of fixed income marketplaces, has enhanced its iTraxx credit default swap index platform in Europe by enabling both sell-side and buy-side clients to access the same bids and offers from liquidity-providing dealers. This addition of inter-dealer trading alongside dealer-to-institutional client trading is designed to improve transparency and promote more liquid markets for all participants. This blurring of boundaries between Dealer to Dealer (D2D) and Dealer to Client (D2C) is a key feature of today's markets and was exemplified in April, 2013 by Nasdaq's acquisition of eSpeed which is a US treasury D2D marketplace in contrast to Nasdaq itself which is an A2A OB market (an exchange).

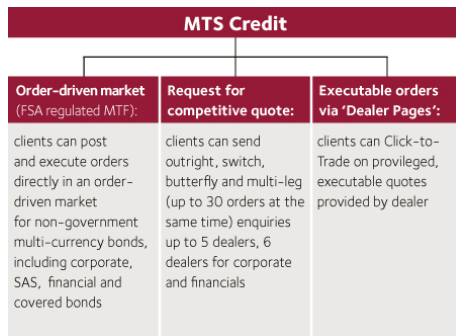
Some providers are now offering what was once known as a 'call market' or a *la criée* in France which is also the way in which most European stock markets including the LSE set opening and closing prices, but which bond dealers call a 'sessions' or 'periodic auction' market. By having a twice daily, daily or weekly (periodic) auction, rather than a continuous auction, it is possible to aggregate the buy-side's demand for liquidity over a period of time into a short trading session. It is thus much more likely that a match can be found for bonds which trade relatively infrequently. In addition, if there is no match, then the provider of the 'sessions' platform, may be willing to take the other side. Goldman Sachs, for example, operates GSessions in which it invites clients to post bids and offers and in which the transactions are with Goldman as (riskless principal) counterparty. On those trades where there is no available counterparty, Goldman will commit capital to complete the trade (risk principal). To date not much has been revealed about volumes on this system.

GFI offers what it calls a hybrid system using both electronic trading and voice assistance. It operates in a similar way to a limit order book in many regards. It requires two parties to agree a price at which they will trade, but GFI then advertises the trade to the market for a brief period. More often than not, other participants join in and the trade goes through in larger size than the amount agreed between the two original parties. This system brings in people who are neither traditional takers or makers but a third group which is opportunistic: people who want to see a trade happening first and will then go along. Order book trading can also be supplemented by periodic auctions when there is insufficient liquidity in the continuous trading order book.

The Order Book for Retail Bonds (ORB) is the London Stock Exchange's electronic platform for private investors trading fixed income securities. The ORB offers continuous, transparent, two-way tradable prices in around 150 individual UK gilts, supranational and corporate bonds, all tradable in typical denominations of £1,000 or less. This market also offers issuers a high profile route to raise debt capital from a retail audience such as the retail bonds issued by Tesco Bank. The LSE also owns the MOT platform in Italy which has similar features.

Order-book systems in Europe such as ORB as well as in the United States have been thought of as mostly for retail-size orders. However, if there is an expansion of institutional-size parent orders being turned into child orders by an investor's algorithms, then increasingly the traditional sharp distinction between retail and wholesale may disappear. Order-book platforms include BrokerTec Europe and EuroTLX. EuroTLX microstructure has at least one liquidity provider for each of the over 4,000 traded financial instruments. It also has real time pre and post-trade transparency on all securities. In the institutional market there is UBS-PIN-FI (price improvement network, fixed income).

MTS credit as shown in the graphic offers three trading modalities – OB, RFQ and Click to Trade on dealer quotes.



Blackrock, the world's largest fund manager, launched a buy-side to buy-side (B2B) platform in 2012 which sought to match buyers and sellers in a "crossing." BlackRock Solutions fee for the service would be much lower than the spread on a dealer transaction. Much of the business would come from the large number of fixed income funds that Blackrock manages as well as third party investment managers. The internal business arises from the fact that funds have different objectives and while one Blackrock fund might be selling particular bonds, other funds in the Group might be buying the same bonds.

The problem with 'crossing' is determining the price for a bilateral exchange between two buy-side participants which, in the absence of a multilateral market price, could be considered 'fair' to both sides and agreed as fair by the regulator. This problem is solved in high-cap equities by the use of the mid-price of the best bid and offer (BBO) across all the marketplaces in which that equity trades – the European Best Bid and Offer (EBBO). But this is not available for bonds. In fact, Blackrock announced in late April, 2013, that it was discontinuing its attempt to offer such a service. It was reported that instead it would offer its clients access to MarketAxess. However, having one fewer platform in the market could have the advantage to the buy-side of providing a greater degree of liquidity aggregation since one of the problems with the new market structure that is being created in bonds is that it is even less of a central market place than before. This is possibly the most concerning issue today in equity trading and is an increasing issue in bond trading.

One attempt to overcome the pricing problem was engineered in the US by Benchmark Solutions. This was set up by one of the co-founders of Tradeweb and was designed to offer market-calibrated pre-trade intelligence for the fixed income and derivatives markets. Its intraday bond prices were updated every 10 seconds, much faster than the streaming prices which dealers provide to their customers. Its aim was to provide its customers with the pre-trade price transparency they have in the stock market, so they could discover new trading opportunities and better understand the value of their positions before trading. Benchmark Solutions closed in April, 2013 having failed to make their business model work.

Pre and Post Trade Transparency and Central Markets

The difficulty in pricing securities which don't trade actively remains, and may always remain a difficult issue. However, unlike infrequently traded equities where agreeing on a 'price' is almost impossible due to uncertain future cash flows, on a bond, cash flows are certain unless the issuer defaults. As a result, 'fair price' bond valuation in the absence of a market price should be easier than in lightly traded equities. Comparison with similar bonds issued by similar companies which have traded recently is certainly one means of valuation and thus the availability of post-trade execution prices and pre-trade prices on some similar but more liquid bonds would be valuable.

The issue of bond market transparency was addressed by a Financial Services Authority (FSA) industry working group on Secondary Bond Market Transparency which, in 2005, published a report "Trading Transparency in the UK Secondary Bond Market". This Group was set up to examine whether or not the UK would benefit from greater post-trade transparency in bond markets. The conclusion then was that, on balance, it would not. Today the conclusion might be different and indeed, MiFID II has already overtaken that debate. But achieving not only post-trade transparency but pre-trade transparency and a best execution rule is fraught with difficulty. Even Daniel Gallagher, an SEC Commissioner, has noted that:

There is a risk... that regulators will, by default, try to impose the equities markets oversight paradigm on the bond markets. Instead, the Security and Exchange Commission's regulatory approach toward the bond markets must continue to be based on recognizing and understanding the fundamental differences between bonds and equities, without assuming that what is good for one will automatically

be good for the other. And, ideally, we will reach a point where the SEC, through thoughtful, comprehensive, and data-driven analysis, will understand the differences and interplay amongst the equities, debt and credit markets so that we can be a more sophisticated regulator of those markets.

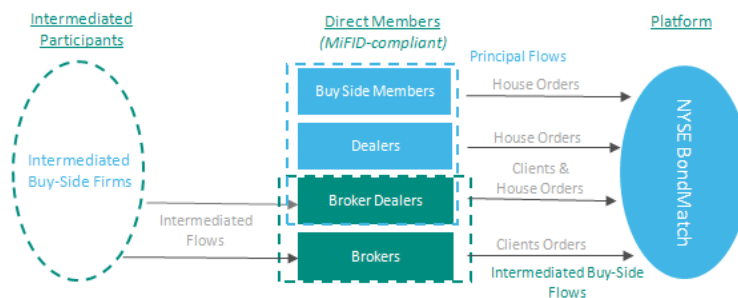
If that is achieved in the US, we might hope it could be achieved in the EU. The omens are not good, however. The Markets in Financial Instruments Regulation states:

‘In order to strengthen the transparency and improve the functioning of the internal market for financial instruments, a new framework establishing uniform requirements for the transparency of transactions in markets for financial instruments should be put in place. The framework should establish comprehensive rules for a broad range of financial instruments.’

The expression ‘broad range of instruments’ clearly includes bonds and derivatives.

Despite this possible backward step, one step that could lead towards better functioning bond markets in the EU was the setting up in 2010 of the Cassiopeia Committee, with support from the French Ministry of Finance and Economy. Its objective is to design an ‘ideal’ rule book for an electronic institutional European corporate bond trading MTF which would be an All-to-All platform with an anonymous order book, firm prices and a CCP. A key difficulty remains and that is the lack of price data, pre and post trade, for securities which don’t trade actively which will continue to be a problem for such securities even after MiFID II comes into force. However, one outcome of the Cassiopeia initiative was the establishment of NYSE BondMatch though it has to be noted that it does not offer trading services in illiquid bonds:

BondMatch is an order book, All to All platform. The eligible securities are investment grade corporate, financial and covered bond issues of €500m and above listed on an EU RM and eligible for LCH Clearent. In the graphic below it can be seen that the buy-side can choose to access the market either through a broker/ dealer or directly i.e. can place priced limit orders directly in the market.



Interestingly BondMatch also offers the *issuer* the opportunity to contract with a liquidity provider (LP) to ‘optimise liquidity’ and ensure ‘price regularity’ in return for a fee and also to sell/ buy/ hold securities on behalf of the issuer. The LP remains the sole judge of its interventions on the market and thus cannot be accused of market manipulation. To date volumes on this platform have not been huge but changes in the regulatory framework are likely to result in this type of platform becoming more competitive against other models.

One objection that some dealers have to A2A anonymous systems is that if the dealer was in the initial distribution syndicate, he/ she would know which investors held the bonds at issue making it easier subsequently to ‘find the other side’ of a trade. This insight would be lost if bonds passed through an anonymous platform. A key function of a broker/ dealer is ‘making markets’ by knowing who might provide the counterparty to a customer order. This ‘knowing who’ information would be lost and so the efficiency of markets would be reduced. Thus in illiquid bonds contact with investors, even those who may not have given any recent indication of interest in the bond or in similar bonds, and talking to them by telephone to see if they could be interested in taking the ‘other side’ at a favourable price, is an important role in the efficient functioning of corporate bond markets.

Many of the difficulties of achieving good execution in bond markets result from the absence of a single central marketplace as equities once had in the shape of ‘the exchange’. In bonds this is even more important since bonds trade less than equities and therefore bringing all buy and sell interests together in one place is even more important. In Europe even in equities we don’t yet have a consolidated tape (price feed) of pre-trade prices or executions on all the various competing execution venues. But just as the absence of a single central marketplace

in equities or bonds may reduce market efficiency, so the absence of a publically available central registry of current holders of bonds exacerbates the problem. It reduces the ability of market participants to find matches in a market structure with so many competing platforms. One innovation that could help create better order matching even without a central market would be a central registry of owners of bonds. This would allow any bond holder to be notified electronically by the central registry if there was a request for quote on any platform, in a bond, or related bond, in which they had previously indicated an interest. Those who put out RFQs would not know who held such bonds unless the bond holder responded to the RFQ. Such a registry would facilitate trade executions for institutional investors who were trying to acquire or dispose of particular bonds. Such a registry might be opposed by the large broker/ dealers, just as they opposed the Eurex platform and the first LSE SETS platform since one of their competitive advantages is 'knowing where the bodies are'. It might also be opposed by investors such as hedge funds which are active bond traders and where information asymmetries are what drive their business model.

Single Dealer Platform/ Portal (SDPs)

Single dealer platforms are the modern replacement for voice trading. But additionally, they give access not only to the bond trading dealing books of individual broker/ dealers but all their FICC and equity services. An example of how the SDP operates at present, giving clients access to all the dealing desks in a bank, is shown in the graphic below. This model is in contrast to multiple dealer platforms such as MarketAxess or Tradeweb which operate in the opposite way by being relatively specialised in terms of product but give access to a wide range of different firms' dealing desks. Forecasting the future for such platforms is difficult as the legislation which will determine their future, including resolving the issue of whether best execution is required and what this would mean in practice, has not yet been agreed. Also, the impact of legislation will differ on the two sides of the Atlantic.



However, it looks as if many SDPs will change from the model described above to become broker portals (rather than dealer portals) which provide their clients with an aggregation of a wide range of possible liquidity providers including MDPs and OBs in a wide range of cash and derivative products. Thus individual broker/ dealers if they remained as market makers would not offer their clients direct access to their prices but only through MDPs thus enabling clients to obtain regulator approved best execution (if this becomes mandatory). To the extent that they channel customer business to MDPs, they could in fact channel it back to the dealing book of the SDP owner if it happened to have the best price.

The great advantage of the SDP from the point of view of the broker/ dealer is that it retains a hold over the customer as it is not anonymous which OBs are. In practice, what seems to be happening is that SDPs are becoming like order management/ execution management systems (OMS/EMS) which function by aggregating liquidity through providing broker access to multiple execution venues in a variety of instruments. Such platforms are thus not so much single *dealer* platforms but single *broker* platforms. They provide access to many cash, CDS, FX and other derivative products rather than just corporate bonds. Indeed they can be portals to everything the FICC division of a broker/ dealer has to offer including the dealing book in non-standard derivatives which will still trade OTC. They have been developed using Rich Internet Application (RIA) technology rather than HTML and function more like 'social websites and games'. The quality of user experience can be a key competitive weapon as firms try to ensure that their markets don't become ones where price is the only differentiating feature. Feature differentiation rather than competition only on price, is key in preventing this.

A good example of a single dealer platform is that provided by Barclays through BARX FI. Prices can be accessed directly from Barclays on this platform but many of the platform's services can also be accessed through MDPs (multi-dealer ECN's in Barclays terminology) including Bloomberg, Tradeweb, BondVision, MarketAxess and Thomson Reuters. Other banks providing SDPs, Smart Order Routing (SOR), distribution of prices etc. are Banca IMI, UBS, Credit Suisse, Deutsche Bank, JP Morgan and others. In addition, Barclays is now offering selected equity clients the ability to 'call-down' Barclays own capital to take part of the other side of a trade to minimise

market impact by utilising what it calls a 'self-serve' algorithm. Such a mechanism if it succeeds in equity markets could also be applied in bond trading.

Innovation and Complexity

Achieving the full potential of the corporate bond market and other types of debt markets such as trade finance to facilitate European growth will also require innovation in private debt funds (such as Cordiant in the emerging market space), loan securitisation and in alternative financing models such as crowdfunding (peer-to-peer financing). Bond ETFs are one partial answer to the problem of poor liquidity in individual, relatively small, corporate bond issues since ETFs can be larger than any single bond and trade on exchange as a 'bundle' of diversified cash flows. Nonetheless, for an investor buying such ETFs in the secondary market, the pricing question remains open. If the underlying bonds are hardly trading at all, how do you value the bundle of bonds in the ETF.

One partial solution to this problem is an innovative structure recently offered by BlackRock. It overcomes a problem which is that normally the benefits of a bond ETF come with the drawback that such funds have an infinite life – as bonds mature they are replaced by new ones. For some institutional investors, this absence of the self-liquidating nature of bonds makes ETFs unattractive. This new structure, on the other hand, invests in a basket of bonds and at a pre-agreed date the ETF will be liquidated. Provided the maturity of the bonds provides a close match to the liquidation date of the fund, the issue of pricing is substantially reduced since when the bonds are redeemed by the issuer, this will be at par (assuming no defaults). Thus whereas with most ETFs, whether bond or equity, the only way for an investor to obtain liquidity is to find another investor who wishes to provide that liquidity, in this case it is the corporate itself which provides the liquidity and at a price known well in advance. Thus price discovery is not necessary at this point. Thus once again, liquidity risk (and much of the pricing risk) has been transferred away from dealers in this case to issuers. These particular funds mature in 2016, 2018, 2020 and 2023 and provide monthly income. If however an investor wishes to liquidate before the maturity date this is likely to be much easier than with a set of individual bonds as these funds should have the better pricing and liquidity of an ETF compared with individual bonds.

We are probably still at the stage in electronic market development where 'New and Improved' platforms will continue to be announced at regular intervals. But we will also see a Darwinian process whereby many systems will fail to gather sufficient business and will disappear. Will there be an end-state? We doubt this will happen for many years – certainly in equities and FX there is little sign of 'innovation' slowing down – quite the opposite indeed, though the nature of the innovation may be the opposite of that in the past. In equities and FX, for example, a key issue at present is the role of HFTs. EBS, a major FX platform owned by ICAP is considering abandoning the usual 'time priority' rule for each order and replacing it with execution of 'batched orders' (received at different times) on the platform at a single time in order to try to minimise what is considered by some to be front-running between HFT customers and others as a result of low latency systems. A new platform, ParFX, launched in April 2013 by large banks including Barclays and Deutsche Bank (to help overcome the HFT problem), has a similar system with randomised pauses to ensure a 'fair trading system for all' which means banks and buy-side versus HFTs. Thus not all 'innovation', in this case HFT and low-latency, necessarily improves the outcome for investment clients and some innovation involves 'back to the future' technology to stop the trading 'arms race'.

For relatively liquid bonds, exchange type (multilateral) trading may become more common. Clearly i-bonds (Apple) will be able to trade very efficiently on an exchange or MTF. We would expect HFTs to move into the bond space particularly now that it has become much harder for them to generate good profits in equity markets and this would probably lead to smaller trade size. Hopefully in corporate bonds we will avoid the latency arms race we have seen in equities and FX. It could also make good business sense for A2A bond platforms to copy the equity market MTF model by offering maker/ taker pricing to encourage participation by liquidity providers whether dealers or institutional investors. But at times when a security is little traded, clearly a continuous market with pre-trade transparency and 'click to trade' prices is not a conceivable model. Even periodic auctions may not solve the problem. Thus broker/ dealer capital facilitation will remain necessary but the cost of providing it will be higher than in the past.

Institutional large in scale (LIS) crossing networks for bonds such as Liquidnet provides for equities and using a reference price should be a viable business model in which investment institutions of any size transact with each other without broker dealer, MDP or SDP intermediation. However under Article 4, point 14a, European regulators, on 22 May, 2013, introduced a *volume cap mechanism* that may have a dramatic effect on dark trading in Europe. The 'new Presidency compromise' as it is described, reads:

'(14a) (new) In order to avoid any negative impact on the price formation process, it is necessary to introduce an appropriate (omitted 'minimum threshold') volume cap mechanism for orders placed in systems which are based on a trading methodology by which the price is determined in accordance with a reference price...'

What this means is that the previous proposal for trades going through a dark pool having to be of a minimum size has been abandoned as part of the compromise to ensure that a Regulation can be implemented quickly (even if the Regulation may be flawed), and instead, regulatory control will be based on a cap on the percentage of trading (in practice a low percentage) that can go through mechanisms using a reference price. This would seem to us to be a retrograde step in terms of its implications for market liquidity.

Conclusion

Markets are likely to be much more transparent than ever in the past, with more business transacted on RMs and MTFs but with RFQ systems remaining very important and absolutely necessary for lightly traded securities. However, more RFQ systems may open up to the sell-side. Straight through processing will become standard on a high proportion of transactions if only to reduce costs. The new world will require some adaptation by platform providers, but more particularly by brokers, dealers, regulators and issuers if we are to see the bond markets in Europe make a full contribution to financing an increase in the capital stock, employment and, hopefully, economic growth across the EU. At the same time we are likely to see a massive consolidation of all types of intermediary as some business areas decline and strong firms look to acquisitions in new growing business areas to compensate.

The added complexity of trade execution in the future is resulting in a need for technology to simplify the trading process. But it is also increasingly likely that many medium and smaller institutional bond investors will contract out trade execution to 3rd party providers. One such provider is EXOE which takes orders from portfolio managers and executes them according to client requirements without the need for the portfolio management company to install the technology and employ the staff required for best execution of what may be a limited number of trades each day. But for dealers, what is certain is that the old way of bond trading, of shouting prices into a phone and being willing to put large risky positions on balance sheet, is certainly not likely to be the way of the future.

At this stage it is too early to say if higher costs and reduced position taking by broker/ dealers in response to regulatory change will result in higher funding costs for issuers of corporate bonds in Europe or if the innovations we have discussed may be able to offset at least some of these additional regulatory costs. It's also too early to know if the buy-side is likely to make up for the inventory shortage in the dealing community by using their own inventory for price making.

The volume cap mechanism is only one of a number of EU regulatory initiatives designed to meet the clamour for reform of financial markets but which may have deleterious effects on the cost of bond market finance. This impact compounds that of the Basel III liquidity rules and the likely impact of the FTT on repo financing of inventory and hence on the cost of using dealer inventory to provide secondary market liquidity. The combination of Basel and EU regulation certainly has the potential to counter all the efforts of individual governments and the G30 to encourage corporations to raise finance for economic expansion through bond markets rather than through fragile banking systems. Certainly at the moment, there is little sign on this side of the Atlantic that regulators are heeding the sentiment we quoted earlier of SEC Commissioner Daniel Gallagher who hoped that 'we will understand the differences and interplay amongst the equities, debt and credit markets so that we can be a more sophisticated regulator of those markets.'

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"See Inside" my new book published by Palgrave Macmillan - "Commercial and Investment Banking and the International Credit and Capital Markets - a guide to the global finance industry and its governance" on Amazon: http://www.amazon.co.uk/Commercial-Investment-Banking-International-Capital/dp/0230370470/ref=sr_1_2?s=books&ie=UTF8&qid=1343642099&sr=1-2

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