BELAIR ADVISORS SÀRL

19 February 2009

Committee of European Securities Regulators

Dear Sirs,

Consultation on transparency of corporate bond, structured finance products and credit derivatives markets

We have pleasure in enclosing our report:

"The causes of bond market liquidity-a survey of market traders: David Clark and Chris Golden[1]- draft report February 2009"

Although not produced in response to your consultation document, the report contains information on transparency and other factors impacting liquidity of fixed income instruments which we believe to be relevant to the consultation. The report is based on a survey of buy-side (bank) and sell-side (investor) traders carried out in June/July 2008. The basic premise of the report is that liquidity providers (market makers) determine what instruments to provide liquidity to, though they will be influenced in those decisions by the demands and behaviour of investors.

A questionnaire listing 47 possible factors impacting the relative liquidity of fixed income instruments was completed in face to face interviews with traders carried out by the authors in June/July 2008.

[1] David Clark is Managing Director of Belair Advisors sàrl, a Luxembourg company specialising in public affairs consulting covering principally financial markets and public health. He started trading swaps in 1984 graduating as a sell side fixed income manager. More recently he was a head of funding at the European Investment Bank where he worked for 10 years designing and implementing bond issuance strategies.

Chris Golden is Chairman of EFFAS-EBC, an association of professional bond analysts. He has worked in numerous trading rooms, including those of Goldman Sachs, Lehman Brothers and Nomura, as trader, salesman and head of research, as well as an independent consultant to a number of banks, government agencies and fund managers, including UBS, the European Investment Bank, Agence France Trésor and Flemings.

Société à responsabilité limitée au capital de 12,500 euro • RCS Luxembourg B140952 • TVA LU22787131
17, avenue Guillaume, L-1651, Luxembourg
Tel : +352 2697 6267 • Fax/answerphone +352 45 88 14 • e-mail : admin@belairadvisors.eu

www.belairadvisors.eu

The 47 factors were divided into six categories one of which is "Valuation and Transparency". For your convenience we extract the relevant sections of the report while stressing that its significance is best understood by reading the whole report.

"*Introduction and summary"*

"This study does not directly address factors affecting overall market liquidity such as the availability of capital to market making or changes in risk capital resulting from volatility and changing correlations. There is no doubt however that these factors impact the relative liquidity of instruments as well as relative credit spreads. It is also the case that factors that impact the relative liquidity of instruments will impact overall liquidity, particularly if broad market behaviour and regulatory practice recognise and act upon them.

This paper thus describes a pilot survey of market participants directly involved in allocating liquidity and directly affected by it. The results of this pilot survey both indicate that there are important regulatory conclusions to be drawn from this approach, and highlight the importance of expanding the scope of such a survey. Further surveys are therefore imperative, and should address a much greater number of market participants, be more widely distributed geographically, and cover a wider range of instruments. Finally these surveys should occur regularly, at least once a year if not more frequently.

Even when using a small market sample as we do here, a number of conclusions of importance both to markets themselves and to regulatory authorities particularly stand out, especially, but not only, in the following areas:

1] The ability to short issues and the availability of CDS are considered key to liquidity by market participants.

2] Post-trade transparency is NOT considered to be a significant contributor to liquidity, and is certainly much less so that pre-trade transparency.

3] Transaction costs are considered to be somewhat irrelevant by both buy-side and sell-side traders.

4] The distinction between privately and publicly issued instruments is paramount."

"The Structure of the Survey

The survey is broken down into three elements. Forty seven potential factors were selected which were divided into six broad categories:

- Issue static data;
- Market environment;
- Market infrastructure;
- Valuation and transparency;
- Funding;
- Issuer behaviour.

Interviewees were asked to rate each factor from 0-10 based on that factor's impact on the relative liquidity of instruments, whether positive or negative.

Within a number of these factors interviewees were asked to evaluate the impact of subsidiary elements of the factors based on a score of -5 to +5. For example within the factor, "*Issue size*", issues over EUR 10 bn score +2.9 out of 5 and below EUR 300 m score -3.5 out of 5, indicating that the fact that an issue's size is larger than EUR 10 bn contributes to its liquidity, whereas a size of less than EUR 300 mn actively detracts from its liquidity."

"Results and analysis

	All	*Sell*	*Buy*
B2 Market environment	*21%*	*21%*	*18%*
B1 Issue static data	*18%*	*18%*	*18%*
B4 Valuation and transparency	*17%*	*17%*	*19%*
B3 Market Infrastructure	*17%*	*17%*	*18%*
B5 Funding	*14%*	*14%*	*12%*
B6 Issuer behaviour	*13%*	*13%*	*14%*

"

"Valuation and transparency

	All	Sell	Buy
A4 **Valuation and transparency**			
34 Standardisation of structure and documentation	7.7	7.9	7.0
30 Pre-trade price transparency	7.3	7.0	9.0
36 Availability of information on underlying (structured/AB products only)	7.0	6.4	8.5
32 Availability of closing dealer quotes for valuation	6.9	6.9	7.0
33 Availability of and/or dependence on comparable benchmarks	5.8	5.8	5.5
37 Availability of public domain valuation models (structured products only)	5.5	5.3	6.0
35 Complexity and/or idiosyncrasy of structure	4.7	4.0	7.0
31 Post trade transparency	4.5	4.1	6.5

Sell-side rated "*standardisation of structure and documentation*" highly, while buy-side gave very high scores to "*pre-trade transparency"* and "*availability of information on underlyings for structured or asset-backed product*"[2].
Significant divergences of opinion between buy and sell-side relate to price transparency, both pre- and post-trade though the former was considered significantly more important by both. This is supported by the answers to subsidiary questions which give a marginally positive score for early post-trade transparency rather than later:

	All	Sell	Buy
31 **Post trade transparency**	4.5	4.0	6.0
Real time (10 minutes or less but trade size capped)	0.8	0.4	2.0
End of day	0.7	0.0	2.3
(trade size capped)	0.7	0.0	2.3
End of next day (trade size capped)	-0.1	-0.7	1.3
One month or more delay	-1.9	-2.6	-0.3

It is not surprising, given the response of securities firms to regulatory imposed post-trade transparency, that buy-side seem to rate post-trade transparency more positively than sell-side.

There is at least a possibility that the regulatory policy areas and senior management in the industry take a different view to actual traders of the impact of post-trade transparency. That at least has been the anecdotal experience of one of the authors. It is also worth noting that most of the opposition to post trade transparency comes from the US where such transparency has been imposed by the TRACE system. European traders do not have actual experience of regulatory imposed post-trade transparency, at least in the markets where the survey was conducted. In any event these results cannot be considered as determining the position and further research would be helpful.

One result is unambiguous. Pre-trade transparency which ranks 10 in the list of factors is considerably more important than post-trade transparency which ranks 40. Regulatory focus on post-trade transparency seems unwarranted except perhaps in the retail market.*"*

"

A. <u>Conclusions from the study.</u>

a. Public Policy

i. Ability to short issues and availability of CDS for hedging are key independent factors in determining liquidity. Regulators and politicians need to take note of this.

[2] Many of the questions within this category related to structured products and most of the respondents were not responsible for trading structured products. Future surveys would need to select a panel of structured product traders if results are to have greater validity.

ii. *Post-trade transparency, if not a negative factor, is of far less significant as a contributor to liquidity than pre-trade transparency.*

iii. *Transaction costs rank poorly with both buy-side and sell-side traders. This may reflect trader ignorance but in modern firms traders should see clearly the effect of transaction costs in their bonuses."*

Although the authors have received commitments of financial support for the study from the International Capital Market Association and from the European Federation of Financial Analyst Societies all aspects of the study were carried out independently of those organisations including the selection of interviewees and arrangements for interviews. No interviewee had advance notice of the questions. Copies of the draft report have only been provided to the sponsors today and they have had no input to its compilation.

Given the low representation of structured credit traders amongst interviewees (only one sell-side structured trader) we cannot speak definitively on this sector. Buy-side traders interviewed did have exposure to the sector. Retail investors of course were not covered and in general it was found that a predominance of retail investors in an issue detracted from liquidity.

Although our report indicates that post-trade transparency **might** have marginal benefits for liquidity of fixed income instruments, with investor dealers having a more positive attitude, it is clear that post-trade transparency comes close to the bottom of factors that may impact liquidity-either positively or negatively. We suspect that if we carried out a similar survey in the United States, which has experience of TRACE and the controversy surrounding it, there would be significantly negative impact recorded. We therefore conclude that there can be no case for mandatory post-trade transparency based on an argument that it would improve the liquidity of bonds. There are many other factors which have a far more significant impact on liquidity.

We would be happy to answer any questions you may have on the report or related issues.

David Clark
d.clark@belairadvisors.eu

Chris Golden
mail@chrisgolden.com

The causes of bond market liquidity-a survey of market traders

David Clark and Chris Golden[1]- draft report February 2009[2]

Introduction and summary

The subject of liquidity is one which has in the past largely been of academic interest. Recently, more sophisticated participants in the fixed income markets have developed liquidity arbitrage models but these tend to be proprietary[3]. Recent events in financial markets have highlighted the practical importance of liquidity, particularly when it disappears. And since the disappearance of liquidity can have such a dramatic impact on the normal function of those financial markets the topic has become of major interest for regulators and other authorities concerned as well as liquidity managers.

The numerous academic studies consecrated to market liquidity are frequently enlightening. But market consultation is of course of primordial importance when addressing possible changes in the structure or working of those markets. The authors of this study further believe that in the specific case of market liquidity, the practical decision-making authority of market-makers in that realm suggests that a survey of the factors which these market participants take into account when deciding how to apply liquidity in practice is crucial in evaluating how to maximise the liquidity of a market.

---

[1] The authors:

David Clark is Managing Director of Belair Advisors sàrl, a Luxembourg company specialising in public affairs consulting covering principally financial markets and health care issues. He started trading swaps in 1984 graduating as a sell side fixed income manager. More recently he was a head of funding at the European Investment Bank where he worked for 10 years designing and implementing bond issuance strategies. He was a member of the UK FSA working group on bond market transparency.

Chris Golden is Chairman of EFFAS-EBC, an association of professional bond analysts. He has worked in numerous trading rooms, including those of Goldman Sachs, Lehman Brothers and Nomura, as trader, salesman and head of research, as well as an independent consultant to a number of banks, government agencies and fund managers, including UBS, the European Investment Bank, Agence France Trésor and Flemings.

[2] The survey is based in interviews carried out in June and July 2008. The study was sponsored by the International Capital Market Association and by the European Federation of Financial Analyst Societies-European Bond Commission, for which the authors express their gratitude. The authors, however, have had complete independence and the conclusions of the study and the views expressed are entirely those of the authors.

[3] Some of these models will frequently trade off volatility in the relevant equity markets. Others, such as the one notoriously used by Citibank London in August 2004, seek to arbitrage liquidity between different trading venues.

V1. 090219

This study does not directly address factors affecting overall market liquidity such as the availability of capital to market making or changes in risk capital resulting from volatility and changing correlations. There is no doubt however that these factors impact the relative liquidity of instruments as well as relative credit spreads. It is also the case that factors that impact the relative liquidity of instruments will impact overall liquidity, particularly if broad market behaviour and regulatory practice recognise and act upon them.

This paper thus describes a pilot survey of market participants directly involved in allocating liquidity and directly affected by it. The results of this pilot survey both indicate that there are important regulatory conclusions to be drawn from this approach, and highlight the importance of expanding the scope of such a survey. Further surveys are therefore imperative, and should address a much greater number of market participants, be more widely distributed geographically, and cover a wider range of instruments. Finally these surveys should occur regularly, at least once a year if not more frequently.

Even when using a small market sample as we do here, a number of conclusions of importance both to markets themselves and to regulatory authorities particularly stand out, especially, but not only, in the following areas:

1] The ability to short issues and the availability of CDS are considered key to liquidity by market participants.

2] Post-trade transparency is NOT considered to be a significant contributor to liquidity, and is certainly much less so that pre-trade transparency.

3] Transaction costs are considered to be somewhat irrelevant by both buy-side and sell-side traders.

4] The distinction between privately and publicly issued instruments is paramount.

Recent problems in the bond markets have highlighted the importance of liquidity for the proper functioning of those (and arguably all) markets. But although there is a large body of work that attempts to estimate the weight of perceived liquidity in the valuation of corporate bonds, as well as some research decomposing that weight into factors that can be seen as influencing the price of liquidity, we have found very little research on what affects the provision of liquidity[4]. Furthermore we have only found one (non-academic) paper dealing with market perceptions of liquidity[5].

Bao, Pao and Wang conclude their paper, "Liquidity of Corporate Bonds"[6] with the following comments.

[4] Laganá, Peřina, von Köppen-Mertes and Persaud (2006)

[5] Mackintosh (1995)

[6] Bao, J., J. Pan and J. Wang (2008)

"Our results raise several questions concerning the liquidity of corporate bonds. First, what are the underlying factors giving rise to the high level of illiquidity? This question is particularly pressing when we contrast the measure of the illiquidity in the corporate bond market against that in the equity market. Second, what causes the fluctuations in the overall level of the illiquidity in the market? Are these fluctuations merely another manifestation of more fundamental risks or a reflection of new sources of risks such as a liquidity risk? Third, does the high level of illiquidity for the corporate bonds indicate any inefficiencies in the market? If so, what would be the policy remedies? We leave these questions for future work."

This study is designed as a pilot for a future study of those underlying factors. It is not an econometric study; it is a survey of dealer opinion. It may serve as an alternative approach to econometric studies or as a guide to future econometric work, or both. The basic premise supporting the study is that traders, whether market makers (sell-side) or traders in investment firms (buy-side), who are respectively the providers of liquidity and the users of liquidity, are likely to have the best insight into the factors that contribute to liquidity. Market makers are granted a limited amount of risk capital to carry on their business but the decision on how to allocate this capital to different instruments is very much their own, subject to the application of financial risk models. Buy-side traders will be influenced by different factors, most notably the wording of investment mandates. Identifying factors which traders believe are important should help econometricians to focus on the most relevant of the broad array of potential and actual influences on market liquidity. A survey study such as this one may also undoubtedly benefit from previous econometric work and the authors are preparing a review of this corpus as part of the further development and implementation of their survey approach.

In order to carry out the study, a questionnaire was designed and presented to traders in London, Luxembourg and Paris. There was no science in the choice of centres and a full study of European markets would certainly include Frankfurt and Milan, among others. In addition a study of US and Asian markets would be likely to throw up contrasting views. Each interview took about 30 minutes and was carried out face to face by one or other of the authors. This limited the number of interviews which were able to be conducted for this pilot study, and initially 15 interviews were carried out: 5 buy-side and 10 sell-side. One set of results was lost and two discarded as statistical outliers, leaving a sample of 12: 3 buy-side and 9 sell-side. Given the range of markets, products and firms covered, this sample cannot be considered sufficient to produce definitive or statistically robust results in general. None the less some significant and interesting results did emerge.

The top five factors seen to impact relative liquidity were:

1. Whether instruments were issued publicly or privately.

2. The liquidity of the relevant benchmarks.

3. The ability to borrow stock in order to run a short position.

4. Whether the issue itself is a benchmark issue.

5. The availability of and transaction costs of derivatives for hedging

Amongst the relevant derivative hedging instruments listed, Credit Default Swaps (CDS) were considered the most important.

Such results can have important policy implications. The ability to short stock and the capacity to hedge with CDS are both clearly vital for liquidity, and yet these are two areas which have drawn the greatest public and regulatory criticism. The contrast between their practical importance to market participants and their negative image in the public sphere also highlights how crucial it is to better inform those outside the markets as to how these instruments work, and why they are vital for markets to function optimally. Potential regulations if poorly designed might well limit the ability of traders to short or to use CDS; alternatively if well designed they could instead improve the orderliness of the market. In addition the credit environment has led investment institutions to become more reluctant to lend stock. We are not aware that any of the top five factors seen to impact liquidity has been the subject of significant econometric studies.

Other results with important implications for regulators are the low ranking of post-trade transparency relative to pre-trade transparency - discussed in greater detail below - and the fact that transaction costs are rated low down the scale for both buy-side and sell-side.

Investors should be concerned by the poor rankings they give to certain issuer behaviour, and to issuers rewarding market-maker support with new mandates, as well as by the lack of focus on the standardisation of both structures and issue documentation.

Probably the clearest conclusion is that relative liquidity is a function of existing benchmark status. Traders are naturally conservative and are reluctant to change whose issues they will use as a benchmark, particularly for hedging and valuation purposes. Once benchmark status is obtained it is hard to dislodge. This of course benefits those bonds which have benchmark status but the existence of a liquid benchmark may also improve liquidity of other bonds in the sector which can be priced, traded, or even hedged, with reference to the benchmark. "*Availability of and/or dependence on comparable benchmarks*" however is ranked at only 33 when included in the Category "*Transparency and Valuation*". This seeming discrepancy needs to be investigated further and the questionnaire perhaps redesigned in order to clarify it.

Another surprising aspect of the responses obtained is that issue size and age of issue rank only 15 and 30 in the list of factors. It is of course possible that these two factors help determine benchmark status and a question addressing this issue should be included in any future survey.

Generally we found that traders welcomed the questionnaire and found the exercise a useful one in trying to address the range of factors which possibly many of them hitherto only rated instinctively. Perhaps not surprisingly senior traders were more considered in their responses than junior ones.

Measuring liquidity

There are three key questions regarding the liquidity of markets: what is it? how do you measure it? and what factors affect it?

The liquidity of a financial instrument may be described as the ability to trade that instrument in reasonable size, promptly, and at a price which is close to the mid-market quoted price without unduly changing that price (however some of these terms may be defined). Temporary dislocations in market price as a result of a trade are also a measure of illiquidity.

Since it is difficult, if not impossible to observe liquidity directly, much research on the subject focuses on possible proxies. The two proxies for liquidity that most often occur in the literature are the bid-offer spread and the turnover of a bond. A typical conclusion resulting from the assumption that these two characteristics are proxies for liquidity is that a bond is more liquid when it has been recently issued than when it ages. We believe that there are difficulties attached not only to the use of either or both proxy measures as reasonable indicators of liquidity, but also to the conclusion just stated derived from those assumptions.

It is frequently the case particularly in academic studies that the bid-offer spread is taken as a proxy for liquidity, with liquidity assumed to increase as the spread narrows. The reasons are compelling, and in theory at least convincing. Such assumptions may be particularly valid in equity markets. But in practice in bond markets the bid-offer spread is effectively unobservable. Studies which use the bid-offer proxy often construct a method for extracting the bid-offer spread of a bond from a series of actual trade data.

For example, Goldstein et al estimate bid-offer spreads using regression estimates of the difference between transaction prices and the previous day's estimated bid price. Edwards et al acknowledge the difficulty of observing bid-offer spreads in the bond market, using an econometric model to derive these spreads from transaction data. Bessembinder et al also estimate bid-offer spreads using a method comparable to those suggested by Huang and Stoll, Madhavan et al, and Schultz.

There are practical reasons why one cannot observe the bid-offer spread of a bond price in time by using published transaction data. For example trades can take place on a one-way price (where the client "opens up" to the trader, in the belief that this will result in an improved price for his/her transaction), and which does not reflect the trader's "normal" price at the time; trades can seem to take place at a loss or no gain (when compared to the previous price), but in fact be part of a package of trades which are profitable overall; traders can also immediately sell a position acquired from a client (or vice versa) for a small loss, in order to provide liquidity to a very good long-term client; or a trade may give a totally false impression of its P/L because of its hedge (which of course need not be in the form of another reported bond); and so on. Small retail trades will incorporate a commission in the price (unlike equity trades) which greatly distorts the traded prices. All of these variations augment the noise content of published transaction prices. In short there are numerous reasons why the raw data derived from a trade-reporting system (even when accompanied by an indication as to whether the trade was a purchase or a sale) are intrinsically inadequate to give a reasonable picture of underlying bid-offer spreads: such derived bid-offer spreads may be better than nothing, but they should be treated with caution and their level of precision assumed to be low. The use of such derived spreads to draw further conclusions must be treated with a level of scepticism in proportion to the stated level of accuracy of such conclusions.

In addition, the practical relationship in the market between specific trader bid-offer spreads and liquidity is far from obvious: the lowest bid-offer spread to be found in a market is almost inevitably composed from two sources – the best bid found and the best offer. While in the past this optimal price may have incurred some search costs, this is increasingly no longer the case where computerised trading platforms are doing the searching. In other words the best bid-offer spread in the market will seldom be found by consulting one single trader.

The case for turnover as a proxy for liquidity is also convincing at first; but it fails to convince at last. In fact an examination of the question should lead to the conclusion that a bond with high turnover does indeed have reasonable liquidity: but it hardly follows from this conclusion that a bond with low turnover has low liquidity. The only true conclusion from the observation that a bond has low turnover is that it seldom trades. The test of liquidity is not that a bond trades often, but that when it does so, it trades in a liquid manner: i.e. promptly, in size, at the market price and without unduly disturbing the market. It is perfectly possible therefore for a bond to trade rarely but still to have very good liquidity when it does trade. As discussed below inter-dealer market making obligations often lead to artificial liquidity and excess inter-dealer turnover. At the very least inter-dealer turnover should be considered separately from investor turnover. CDS frequently result in falling turnover for matching cash bonds as dealers and investors use these as a surrogate for the cash. This fall in turnover does not necessarily imply lower liquidity, in fact it is more likely to coincide with increased liquidity.

As a result, the conclusion that a "young" bond is inherently more liquid than an older bond is partly erroneous: that bonds have high turnover in the period immediately following their issuance largely reflects the distribution process. The initial placement of bonds is seldom final: during the period following a new issue bonds will very often trade relatively frequently as they move from initial "weak" holders to their longer-term "firm" holders.

It should be noted that this study has not set out to define the liquidity of a bond or how it is measured, though we are clearly interested in the subject. We have largely left it to interviewees to have their own concept of liquidity. We have asked one question each about current and future liquidity conditions for the purposes of calibrating this survey (and future ones) to market conditions, as well as one question about the possible describers of liquidity and future surveys may address these questions in more detail. Relative liquidity between bonds is likely to diverge in times of low market liquidity and compress in times of high market liquidity. **The primary purpose of the survey is to establish what factors contribute to or detract from liquidity based on the interviewees' own understanding of what that liquidity is.**

Designing the study

There are two possible approaches towards determining what factors contribute to the relative liquidity of instruments. One is to attempt an econometric study, and a review of academic literature in this area is being conducted by the authors. But econometric studies have a number of problems. In the first place the factors which impact liquidity are likely to evolve with time and changing market circumstances. No such studies have been carried out consistently over time - though the same can be said of market surveys. In addition the factors are likely to be so diverse that it is almost impossible to identify specific causes. For example, certain studies such as Goldstein et al have sought to identify the impact of one factor, such as post-trade price transparency. Goldstein et al studied a number of pairs of similar bonds: one which is subject to post trade transparency; the other not. One problem with this approach is that it presumes that the impact of post-trade transparency will become apparent during the course of the study. But fixed-income traders can be extremely conservative, and whilst they may be aware that one bond is subject to post-trade transparency and the other not, they will not necessarily change their behaviour in the short term. This conservatism is reflected in the

fact that once a bond or group of bonds, often issued by the same issuer, has established benchmark status it is extremely difficult to dislodge them from that position. It probably results from the fact that the many different participants in the market (different types of investors, market-makers, traders, repo traders, regulators, as well as those who design and implement trading and information systems) do not have perfect knowledge of each others' motives and methods. In short, changing the behaviour of the market can be extremely hard, and in any case takes time. This explains why the existence of a benchmark reference, and whether an issue is itself a benchmark, are rated as two of the top five factors in determining relative liquidity. Benchmark issues do lose their status from time to time, but the process is slow and the status will usually move to a more current bond launched by the same issuer.

Issuers can and do try to influence the benchmark status of the bonds that they issue. An important part of that process is the consistency of issuer behaviour over a long period. But many traders will not be fully familiar with the history of issuance. They will come into a market with established benchmark issues and those will remain the benchmarks until they and others decide to change them. This process of change is hardly a consciously concerted one, but evolves in line with group dynamics.

It should in theory be possible to identify the impact of issue size on liquidity yet there are immense hurdles in designing an experiment that will show this. Because of the numerous other factors which influence market liquidity many asset-backed or structured issues of a €1 bn. in size trade considerably less frequently than may a popular retail issue with a size of €300 mn., There are simply too many factors at play to isolate any single factor easily.

The approach taken in this study is to identify as many factors that might impact liquidity of fixed income instruments as possible, to assemble them into a questionnaire and to ask market participants to score or rate the factors. There are of course a number of potential pitfalls in this approach. Two such pitfalls may be found in the design of the questionnaire (which must be neutral), and the identification of as many relevant potential factors as possible (for a comprehensive list of factors). Another is to choose factors that are in some way measurable for the survey to be useful.

The Structure of the Survey

The survey is broken down into three elements. Forty seven potential factors were selected which were divided into six broad categories:

Issue static data;

Market environment;

Market infrastructure;

Valuation and transparency;

Funding;

Issuer behaviour.

Interviewees were asked to rate each factor from 0-10 based on that factor's impact on the relative liquidity of instruments, whether positive or negative.

Within a number of these factors interviewees were asked to evaluate the impact of subsidiary elements of the factors based on a score of -5 to +5. For example within the factor, "*Issue size*", issues over EUR 10 bn score +2.9 out of 5 and below EUR 300 m score -3.5 out of 5, indicating that the fact that an issue's size is larger than EUR 10 bn contributes to its liquidity, whereas a size of less than EUR 300 mn actively detracts from its liquidity.

The factors were selected based on the authors' knowledge and experience of the market as issuer, traders and analyst, as well as past studies of the market. While we attempted to be as comprehensive as possible, even including factors which we did not think would have much impact, inevitably some factors will have been missed or otherwise poorly expressed. Questions relating to trading platforms or inclusion in indices may have suffered through not listing all the most important trading platforms or indices in the subsidiary questions.

The manner in which questions are asked within the questionnaire is clearly important. For instance most of the factors can be assumed to have a positive impact but some may have a negative impact. Respondents may have answered assuming they were measuring the positive impact rather than a negative impact. In the analysis of the study we focus particularly on how the questionnaire may be improved in the future.

Liquidity Survey Results[7]

Preliminary Questions (Calibration etc)

We set the scene by asking the trader how they rate overall current market liquidity conditions, on a score of 0 to 10 where:

0 No market (dealers won't even answer the phone...)
1 Order basis only for all bonds in the sector
2 Order basis only for many but not all bonds
3 Very difficult trading conditions
4 Quite tough to get size away without an order
5 Normal: standard size trades on standard spread
6 Quite good: extra size or tighter spread possible
7 Liquid: good size for best issues and competitive bid-offers
8 Very liquid: active market and tight bid-offers
9 Extremely liquid: very active market, large size and tight bid-offers
10 Hyper liquid: almost anything trades in size with very tight bid-offers

The interviews were carried out in June and July of 2008 – well before the events of October 2008.

	All	Sell	Buy
Market Liquidity	3.5	3.7	3.0

[7] In the tables a reference number precedes Categories and Factors. This refers to their position in the questionnaire. Each Category and its respective factors are colour coded in the questionnaire and in the results. The questionnaire is attached Annex 1

Buy-side appeared to have a slightly poorer view of liquidity conditions than did sell-side traders. As users of liquidity they may have a better view of liquidity conditions. But overall liquidity conditions were considered to be midway between "Very difficult trading conditions" and "Quite tough to get size away without an order".

We also asked traders "How do you feel market liquidity conditions will change in the short term (over next 3-months)? 1. Deteriorate(scores 1); 2. Remain the same(scores 2); 3. Improve(scores 3)." There was a significant bias in favour of improved conditions.

	All	Buy	Sell
Future Liquidity	2.8	2.7	3.0

As future surveys are likely to be impacted by conditions existing at the time this provides a useful calibrator of how results are affected by existing and prospective liquidity conditions.

We then asked traders "To what extent do you consider that relative turnover and volatility are an adequate description of the relative liquidity of a bond? 1. <50%(scores 1); 2. 50-75%(scores 2); 3. >75%(scores 3)."

	All	Sell	Buy
Importance of T/O, Vol	2.1	2.1	2.0

The clear response was that these measures described 50-75% of the relative liquidity of a bond. Future surveys may ask traders what other measures describe liquidity, such as bid-offer spreads, which are often seen as a proxy measure of liquidity or autocovariance of prices as used in Bao et al. It is important here to distinguish between factors that describe rather than contribute to relative liquidity.

Categories

	All	Sell	Buy
B2 Market environment	21%	21%	18%
B1 Issue static data	18%	18%	18%
B4 Valuation and transparency	17%	17%	19%
B3 Market Infrastructure	17%	17%	18%
B5 Funding	14%	14%	12%
B6 Issuer behaviour	13%	13%	14%

Overall evaluation of the categories was made at the end of the survey after dealers had answered questions on each factor.

General

A key distinction between the outlooks of sell-side and buy-side participants lies in their holding period horizons. Sell-side dealers do not expect to hold positions for very long and generally for less than 24 hours; whereas portfolio managers for whom buy-side dealers work generally expect to hold their positions indefinitely, and certainly for significantly longer than 24 hours.

As a result, it is significant but not surprising that sell-side rate market environment at the top while buy-side rate valuation and transparency most highly. Portfolio valuation is of course a

key area for buy-side investors and they will tend to have much larger portfolios relative to their market turnover than do sell-side dealers. Sell-side dealers on the other hand will focus much more on current market environment - which determines their next trade rather than more post-trade related issues. It is also probable that most sell-side traders have greater access to more valuation tools than do most buy-side traders. Large buy-side traders, however, are likely to have access to information from a wide variety of sell-side firms, information which is obviously not available to a single sell-side firm. Other differences are the slightly higher rating given to issuer behaviour by buy-side when answering questions on categories at the end of the survey and the higher rating given to funding by the sell-side. Issuer behaviour is likely to impact the longer term value of issues and hence be of relatively more importance to buy-side investors with their longer horizons; while funding is clearly of importance to sell-side dealers. In the analysis of factors comprising issuer behaviour our buy-side sample tended to rate issuer behaviour lower than do sell-side. This discrepancy between investor attitudes in general and their attitude in particular is a familiar story. Investors give lip service to issuer behaviour but do not follow up the implications of their expressed views in practice. Of course the investor sample is too small to implicate the investor community in general but there is a familiar ring to the survey result. No leveraged buy-side investors were interviewed and they would naturally give a higher weighting to funding. While the investor sample used is particularly small it is very important to recognise the differing factors which buy-side and sell-side will consider of importance. The presumption of this survey is that it is the providers of liquidity, sell-side dealers, who are the determinants of liquidity provision; but that buy-side investors may well force the issue in certain conditions by demanding liquidity in certain issues.

Finally and perhaps most significantly, issue static data is not considered the most important contributor to relative liquidity. This category includes factors such as size and age of a bond which are often considered the most important contributors to liquidity. They are rated respectively 15th and 30th in the rankings of factors. This is certainly a puzzling result but even granted the small sample size and the difficulties in designing the questionnaire the results seem to be significant. What follows most importantly from this result is that liquidity is not static but is, as one might surmise, dynamic; and that the inherent (static) characteristics of an issue do not contribute as much to its liquidity as may be supposed.

Subsidiary questions (sub-factors)

The range of results for subsidiary factors may well better indicate the importance of the factor. For instance, results for the sub-factors relating to "*Bid-offer spread*" which are measured on a scale from -5 to +5, range from +3.8 for a less than 1 bp yield spread to –4.0 for "*offered only*". This is one of the widest range recorded in our sub-factors[8], but had we stopped at "*bid only*" the range of would have narrowed from 7.8 out of 10 (i.e. from +3.8 to -4.0) to 6.7 out of 10 (i.e. from +3.8 to -2.9). If the range is narrowed from "(*tight - less than 1 bp)*" to "*very wide – more than 5 bp*", the range drops to 6.1 out of 10. If a bond is offered only, the implication is that the dealer will not want to buy it at any price. We doubt that econometric studies seeking to measure bid-offer spreads from trade data recognise the concepts of bid-only and offered-only.

Factors – Results Summary

[8] Public/Private issuance records a range of 8.9/10 which makes this virtually a binary factor.

The overall ordering of factors is tabulated below by order of average score from all respondents. Rankings for sell-side only and buy-side only are given in columns 2 and 3. The number for each factor (e.g. *7* for "*Public offering or private*") relates to the order in which the questions were asked.

Detailed commentary is contained in the sections devoted to each category.

	All	Sell	Buy
7 Public offering or private	1	1	5
13 Liquidity of benchmarks	2	3	6
42 Ability to borrow stock/reverse repo	3	2	14
10 Benchmark issue	4	6	8
24 Availability and transaction costs of derivatives for hedging	5	4	15
39 Central bank repo eligibility (open market operations)	6	7	7
14 Average bid-offer spreads	7	9	3
34 Standardisation of structure and documentation	8	5	16
43 Ability to lend stock/repo	9	8	17
30 Pre-trade price transparency	10	13	2
16 Market maker support (number of declared market makers)	11	10	24
18 Investor diversity	12	11	25
36 Availability of information on underlying (structured/AB products only)	13	19	4
32 Availability of closing dealer quotes for valuation	14	14	18
1 Issue size	15	17	9
12 Issuer benchmarks (size and number)	16	16	19
40 Eligibility for central bank liquidity facility	17	12	34
11 Turnover on recognised platforms or markets	18	18	20
51 Issuer's willingness to reward market making with new issue mandates	19	15	37
3 Credit rating	20	21	10
52 Issuer's sensitivity to secondary market conditions in timing new issues	21	20	28
20 Trading platform (list platforms)	22	22	31
49 Issuer's willingness to buy back	23	23	35
2 Currency of issue	24	27	11
9 Maturity and development of market	25	26	21
17 Sector size	26	28	12
22 Listing (if and where)	27	29	26
33 Availability of and/or dependence on comparable benchmarks	28	25	32
44 Inclusion in repo baskets	29	24	36
4 Time since issuance (or last tap)	30	34	13
37 Availability of public domain valuation models (structured products only)	31	32	29
5 Time to maturity	32	30	33
45 Unhedged cost of carry	33	31	40
25 Deliverability into futures contract	34	33	38
28 Withholding tax on coupons	35	41	1
50 Issuer's willingness to lend stock	36	36	41
35 Complexity and/or idiosyncrasy of structure	37	43	22
41 Eligible collateral for RTGS	38	35	46
21 Inclusion in indices	39	38	42
31 Post trade transparency	40	42	27
48 Firms relationship with issuer	41	40	30
23 Depository	42	44	23
46 Hedged cost of carry	43	37	44
27 Transaction costs	44	39	45
15 Variation from par	45	45	39

26 Codified trading conventions	46	46	43
6 Min denomination	47	47	47

Market Environment

Within market environment the following factors are rated:

A2 **Market environment**	All	Sell	Buy
13 Liquidity of benchmarks	8.1	8.1	8.0
10 Benchmark issue	7.8	7.8	7.5
14 Average bid-offer spreads	7.7	7.5	8.5
16 Market maker support (number of declared market makers)	7.2	7.3	6.5
18 Investor diversity	7.1	7.2	6.5
12 Issuer benchmarks (size and number)	6.8	6.7	7.0
11 Turnover on recognised platforms or markets	6.7	6.6	7.0
9 Maturity and development of market	5.9	5.7	7.0
17 Sector size	5.9	5.6	7.5
15 Variation from par	3.5	3.3	4.5

It is interesting that the liquidity of benchmarks is rated more highly than whether an issue is itself a benchmark. This may simply reflect the fact that most traders are trading against a benchmark issue of some sort, rather than trading the benchmark itself. On the other hand this may reflect the fact that a sectoral benchmark may be less liquid than a non-benchmark with a liquid benchmark against which to trade. An off the run US Treasury is more liquid than an ABS benchmark. There are very few ultimate benchmark issues, such as the US Treasury on the run curve, or the Bund curve. Recent divergence, before as well as after the survey was undertaken, between euro government issues have emphasised the importance of the benchmark status enjoyed by the Bund.

There are interesting differences in the results from the buy-side and sell-side. Most significant is the relative importance given by the buy-side to the maturity and development of the market, and sector size. No doubt these factors are heavily weighted in investment mandates. The sell-side is also the one more likely to be promoting newer markets. Average bid-offer spreads are considered more important by the buy-side than sell-side, but of course are determined by the sell-side. The buy-side will tend to be subject to market bid-offer spreads, particularly in times of relative illiquidity, while sell-side dealers will profit from the size of the bid-offer spread. The sell-side dealers may well be prepared to allocate more risk capital to bonds with a wider bid-offer spread. As already discussed, bid-offer spreads are often seen as a proxy for liquidity though they can also be seen as a function of competition in the market. Post EMU and pre-crisis, the euro-denominated bond market could be characterised as suffering from excess competition as dealers from all the component markets competed with each other in a single market. The bid-offer spread is a reward for market making, which itself is a form of option writing. This relates to our preliminary question on the degree to which relative turnover and volatility describe relative liquidity. Excessively tight bid-offer spreads (i.e. where the spread is tighter than is justified by volatility-or perhaps more precisely auto-covariance) can be considered as a deterrent to liquidity inasmuch as market makers are likely to shift capital to

sectors where liquidity provision is more highly rewarded. The shift of trading capital towards highly structured instruments that occurred in the years running up to the financial crisis may well have been a consequence, not only of excessive competition in the high grade market, but also of a lack of transparency in the structured market. Whatever the regulatory disapproval that it engendered, the Citigroup liquidity arbitrage exercise in August 2004, between cash euro government bonds traded on MTS and Bund futures contracts traded on EUREX, did show up the fragility of the liquidity provided on the MTS system. Many sell-side traders commented that MTS promoted artificial liquidity. This is a consequence of dealers having market making obligations to other dealers and thus parcels of bonds being chased around the market with very low transaction costs. The consequence of this kind of inter-dealer market making obligation on measures of liquidity should be examined further.

There is room for more work on the relationship between Bao et al's γ measure, bid-offer spreads, and volatility on the one hand, and other factors that contribute to liquidity on the other. Future surveys could attempt to explore these relationships.

"*Variation of the price from par*", often considered important for some central banks and for retail investors, scores relatively poorly as a factor (3.5).

	All	Sell	Buy
14 **Average bid-offer spreads**	7.7	7.3	8.7
Tight (1 yield bp or less)	3.8	3.7	4.3
Medium (2 yield bp or less)	2.3	2.2	2.7
Wide(5 yield bp or less)	-0.3	-0.6	0.7
Very wide (more than 5 yield bp)	-2.3	-2.2	-2.3
Bid only	-2.9	-3.1	-2.3
Offer only	-4.0	-4.2	-3.3

As mentioned above the wide range of results for different bid-offer spreads may indicate that this factor is more important than its 7th place in the overall rankings would indicate. It may be of interest that sell-side skew their ratings towards the importance of wide bid-offer spreads while buy-side see more positive virtue in tight bid-offer spreads. The competitive forces leading to tight bid offer spreads may be the explanation. Dealers do not like excessively tight and competitive markets and are also better able to understand the implications of bid only or offered only.

	All	Buy	Sell
18 **Investor diversity**	7.1	7.1	7.0
Central banks	2.6	2.6	2.7
Other AM	2.3	2.3	2.3
Banks	2.3	2.3	2.0
Insurance	2.0	2.1	1.7
Hedge funds	1.3	1.4	1.0
Retail	-1.8	-1.7	-2.0

Interviewees were asked to rate the different classes of investors, assuming that they were the predominant investor in an issue. The range of scores for the different classes of investor is

significant if not very large. The negative score for retail investors reflects the fact that retail investors rarely trade their positions and tend to hold bonds to maturity (this of course may be partially a response to the very large dealing costs that they incur, making trading uneconomic). In addition retail investors rarely lend their stock which can make it extremely difficult for market makers to borrow stock if they go short of an issue in which retail investors predominate. The ability to borrow stock is considered, by sell-side dealers, to be the major factor contributing to liquidity of issues (see: "*A5 Funding*"; "42 *Ability to borrow stock*", below). Note that we did not include average trade size as a factor in relative liquidity. Small relative trade size is an indicator of a retail market which may lead to relative illiquidity for reasons stated above. In addition it is likely to be a consequence of illiquidity rather than a cause. We will nonetheless consider whether to include this as a factor in future surveys.

Central banks are popular contributors to liquidity but this may well be due to the fact that they tend only to invest in liquid issues. The trend by central banks with excess reserves, or more relevantly sovereign wealth funds, to buy less liquid issues is a factor which needs to be covered in future surveys. Again bank liquidity portfolios will focus on more liquid issues. The relative preference for "*Other asset managers*" over "*Insurance companies*" reflects the fact that the latter will tend to be longer term holders. As a result they will invest in less liquid longer dated issues and are less likely to trade their positions (See: "*A1 Issue static data*"; "*5. Time to maturity*"). Hedge funds are often unpopular with sell-side traders when they are viewed as opportunists feeding on the liquidity provision of market makers. They may also be viewed as being as smart, or smarter, than sell-side traders, with many of their traders having graduated from sell-side firms.

	All	Sell	Buy
9 **Maturity and development of market**	5.9	5.8	6.3
<1yr	-3.1	-2.7	-4.0
1-2yrs	-1.9	-1.6	-2.3
2-5yrs	0.0	0.2	-0.3
5-10yrs	1.9	1.8	2.0
>10yrs	3.1	3.0	3.3

While the overall score given to the maturity and development of the market is relatively low the discrepancy between the -3.1 score for markets established less than a year ago, compared to a positive score of 3.1 for markets established more than ten years ago is significant. It should, however be reflected that newer markets are likely to be more complex than older markets. Mortgage markets which are well established, in particular the Danish and US markets, where call optionality is embedded in the issues, or German Pfandbriefe, do indicate that even complex markets can be relatively liquid if they are well established with developed conventions (see: "*A4 Valuation and transparency*").

	All	Sell	Buy
15 **Variation from par**	3.5	3.4	3.7
Close to par (+/- 1/2% p.a. of remaining maturity)	1.8	1.5	2.7
Discount to par	1.0	0.8	1.7
Premium to par	-1.5	-1.6	-1.0

Variation from par seems to have little impact as a factor though there is a notable preference for issues at a discount to issues at a premium.

Issue static data

A1 **Issue static data**	All	Sell	Buy
7 Public offering or private	8.6	8.7	8.0
1 Issue size	6.8	6.6	7.5
3 Credit rating	6.4	6.2	7.5
2 Currency of issue	5.9	5.6	7.5
5 Time to maturity	5.4	5.4	5.5
4 Time since issuance (or last tap)	5.6	5.2	7.5
6 Min denomination	1.4	1.7	0.0

Time to maturity and the length of time since issuance, which are often considered to be critical factors in the liquidity of an issue, ranked a poor 5 and 6 in this category though there is a significant difference between buy-side and sell-side in ranking the importance of time since issuance. One has to suspect that buy-side experience considerable difficulty in obtaining good quotes from the sell-side on older issues though why this factor should rate so low among sell-side is something of a mystery. The greater ability of sell-side traders to hedge and warehouse positions in old issues may have a bearing on the issue.

	All	Sell	Buy
7 **Public offering or private**	8.6	8.8	8.0
Public	4.6	4.6	4.7
Private	-4.3	-4.4	-4.0

While there is no surprise in the results for public vs. private offerings, particularly when it comes to the unanimity of buy and sell-side, the results are useful calibrators of the rest of the survey with public offerings scoring 4.6 out of 5 and private offerings -4.3 out of -5. As we have commented above this makes this factor almost binary in its impact. It should also be noted that many public offering are in effect little more than private placements though the legal format makes them more accessible to a wide range of investors. There is also a wide range of opinions as to what is a public and what is a private offering apart from the strict legal definition based on the Prospectus Directive. A clearer understanding of what traders understand by the words "public offering" and "private offering" in this context would be helpful.

	All	Sell	Buy
1 **Issue size**	6.8	6.6	7.3
EUR 10bn+	2.9	2.6	3.7
EUR 5-9.9 bn	2.1	1.4	3.7
EUR 1-4.9bn	1.6	1.3	2.7
EUR 0.3-0.9bn	-0.9	-1.3	0.0
<EUR 0.3bn	-3.5	-3.6	-3.0

EUR 1 bn marks the cut off for size to be a positive contributor to liquidity. Issues of less than EUR 300 mn are considered highly negatively.

	All	Sell	Buy
3 **Credit rating**	6.4	6.0	7.7
AAA	3.2	3.3	3.0
AA/A	1.4	1.0	2.7
BBB	-0.9	-0.8	-1.3
NIG	-2.8	-2.5	-3.3

The survey was conceived largely as a result of the failure of credit rating agencies to rate liquidity. However it is obvious that credit ratings themselves have an important impact on liquidity-even if not the most important. Ratings below 'A' are considered to be negative contributors to liquidity, particularly if they are NIG (i.e. Not Investment Grade) probably because many institutional investors cannot own NIG rated credits.

	All	Sell	Buy
2 **Currency of issue**	5.9	5.4	7.3
USD	2.4	2.5	2.3
EUR	3.5	3.1	4.3
GBP	0.6	0.6	0.7
JPY	-0.8	0.0	-1.7
CHF	-1.7	-2.0	-1.3
Other developed	-2.0	-2.8	-1.0
Emerging currency	-2.7	-3.7	-1.7

In viewing the currency preferences of respondents it must be emphasised that the survey was carried out in Europe and that therefore EUR-denominated issues are inevitably rated higher in liquidity terms than those in USD. This no doubt also reflects the large number of EUR market makers, and the highly competitive nature of the EUR in the European market place. Liquidity support given by the ECB is also likely to be a major factor. Relatively poor liquidity scores for sterling and poor ratings for all other currencies are significant, particularly inasmuch as these are also European currencies. Biais et al[9] use data provided by ICMA TRAX (now Xtrakter Ltd.), and established that bid-offer spreads in the sterling market were approximately twice those in the euro corporate bond market. The smaller size of the sterling market and the considerably fewer active dealers and major investors are no doubt a major factor in this (see: *"A2 Market environment"*; *"24. Number of declared market makers"* - below).

[9] Biais, Declerk, Dow, Portes, and von Thadden (2006)

4 **Time since issuance (or last tap)**	All 5.6	Sell 5.4	Buy 6.0
<6mths	3.2	2.9	4.0
6-12 mths	1.0	1.0	1.0
1.1-5yrs	-0.4	-0.1	-1.3
5.1-10yrs	-1.3	-1.0	-2.3
>10yrs	-2.5	-1.9	-4.3

At the time that the survey interviews were carried out, traders expressed a strong preference for instruments around the three year maturity range, and both buy and sell-side prefer younger issues: i.e. those most recently issued irrespective of final maturity.

Time since issuance is frequently cited as the largest factor in the liquidity of bonds with trading dropping off sharply six-months after issuance. It is therefore a considerable surprise that this factor is considered relatively low down the scale. Early trading in a bond (during the first six months) may not be considered as true secondary trading as much of it will be interbank or opportunist new issue investors seeking profits or cutting losses. The fact that there is a clear gradient to time since issuance with maturities over one-year being considered as negative is nonetheless important.

5 Time to maturity	All 5.4	Sell 5.2	Buy 6.0
<1yr	0.5	1.0	-1.0
1-5yrs	2.8	2.3	4.3
5.1-10yrs	1.8	1.7	2.0
>10yrs	-0.8	-0.6	-1.3

It is notable that buy-side have a marked aversion to instruments under one year and over 10 years. This may be because of the nature of their mandates and the fact that bonds drop out of fixed income indices when their remaining life falls below one year. Factors relating to the financial market turbulence at the time will also have strongly influenced responses, notably the withdrawal by many investment institutions from the asset backed commercial paper market where risk perception had increased dramatically.

Valuation and transparency

A4 **Valuation and transparency**	All	Sell	Buy
34 Standardisation of structure and documentation	7.7	7.9	7.0
30 Pre-trade price transparency	7.3	7.0	9.0
36 Availability of information on underlying (structured/AB products only)	7.0	6.4	8.5
32 Availability of closing dealer quotes for valuation	6.9	6.9	7.0
33 Availability of and/or dependence on comparable benchmarks	5.8	5.8	5.5
37 Availability of public domain valuation models (structured products only)	5.5	5.3	6.0
35 Complexity and/or idiosyncrasy of structure	4.7	4.0	7.0
31 Post trade transparency	4.5	4.1	6.5

Sell-side rated "*standardisation of structure and documentation*" highly, while buy-side gave very high scores to "*pre-trade transparency*" and "*availability of information on underlyings for structured or asset-backed product*"[10].

Significant divergences of opinion between buy and sell-side relate to price transparency, both pre- and post-trade though the former was considered significantly more important by both. This is supported by the answers to subsidiary questions which give a marginally positive score for early post-trade transparency rather than later:

	All	Sell	Buy
31 **Post trade transparency**	4.5	4.0	6.0
Real time (10 minutes or less but trade size capped)	0.8	0.4	2.0
End of day	0.7	0.0	2.3
(trade size capped)	0.7	0.0	2.3
End of next day (trade size capped)	-0.1	-0.7	1.3
One month or more delay	-1.9	-2.6	-0.3

It is not surprising, given the response of securities firms to regulatory imposed post-trade transparency, that buy-side seem to rate post-trade transparency more positively than sell-side.

There is at least a possibility that the regulatory policy areas and senior management in the industry take a different view to actual traders of the impact of post-trade transparency. That at least has been the anecdotal experience of one of the authors. It is also worth noting that most of the opposition to post trade transparency comes from the US where such transparency has been imposed by the TRACE system. European traders do not have actual experience of regulatory imposed post-trade transparency, at least in the markets where the survey was conducted. In any event these results cannot be considered as determining the position and further research would be helpful.

One result is unambiguous. Pre-trade transparency which ranks 10 in the list of factors is considerably more important than post-trade transparency which ranks 40. Regulatory focus on post-trade transparency seems unwarranted except perhaps in the retail market.

[10] Many of the questions within this category related to structured products and most of the respondents were not responsible for trading structured products. Future surveys would need to select a panel of structured product traders if results are to have greater validity.

Market Infrastructure

A3 **Market infrastructure**	All	Sell	Buy
24 Availability and transaction costs of derivatives for hedging	7.8	7.9	7.0
20 Trading platform (list platforms)	6.1	6.2	5.5
22 Listing (if and where)	5.8	5.6	6.5
25 Deliverability into futures contract	5.1	5.3	4.5
28 Withholding tax on coupons	5.1	4.1	9.5
21 Inclusion in indices	4.5	4.6	4.0
23 Depository	4.4	3.9	7.0
27 Transaction costs	4.2	4.6	2.5
26 Codified trading conventions	2.3	2.1	3.0

Two differences between buy and sell-side stand out within the section devoted to market infrastructure: "*Withholding tax*" and "*Depository*". These factors are of course more important for long term holders than for liquidity providers. Where withholding tax is levied sell-side dealers will have procedures in place to recover it and will usually actively engage in arbitrage that relies on their ability to obtain a refund of credit against withholding tax. Although the ECB has brought the issue to prominence, depositary risk is one of which investors are only just becoming aware. In the case of investors responding to this questionnaire the focus may be more of an administrative and cost issue. Possibly sell-side traders are more likely to have arrangements in place to hold securities in different depositories and to effect transfers between them. Having said this major custodian firms will provide similar services for investors. Possibly subsidiary questions to analyse the nature of concerns over depositories would be appropriate. There can be significant delays and costs in moving securities from one depository to another.

Disappointing in many ways is the relative lack of importance given to codified trading conventions. It is at least possible that these are taken so much for granted that they are not actively considered. A market with no codified trading conventions is unlikely to be liquid. This points to possible limitations in a questionnaire of this nature. However it is possible that if the question were in the negative - by asking what the impact of no codified trading conventions would be - a different response might have been obtained. More relevantly there is strong anecdotal evidence emerging in today's market that smaller traders, in particular, are realising the importance of trading conventions in turbulent and illiquid markets. Trading conventions are important to liquidity but like any laws they are important in protecting weak from the strong. Ultimately it is in the interest of strong participants to ensure that the small participants feel that they are playing on an at least a reasonably level playing field.

24 **Availability and transaction costs of derivatives for hedging**	All 7.8	Sell 7.9	Buy 7.3
Interest rate futures	2.2	1.7	3.3
OTC IRS	2.0	1.3	3.7
OTC CDS	2.9	2.7	3.7

The availability and cost of derivatives for hedging purposes is one of the key factors in determining the liquidity of instruments. Of the factors considered, credit default swaps (CDS)

are clearly considered most important. The regulatory concern with the clearing of CDS since the start of financial market turbulence perhaps illustrates the importance of CDS for the functioning of a modern financial market. The shifting in the basis between CDS and cash bonds as a result of the rising importance of cash liquidity since as well as before this survey was carried out has resulted in significant losses for a number of traders but we suspect CDS remain a key element in bond market liquidity. The irony of course is that the use of CDS has tended to lead to a fall in cash bond turnover. Industry studies which credit the fall in cash bond turnover on the TRACE post-trade transparency system in the US have been countered by arguments that it is the rise in the use of CDS that has led to a fall in cash bond turnover. Academic studies that look at cash turnover as a surrogate for liquidity will need to take into account the commensurate use of CDS.

Interest rate futures which have been the hedging instrument of choice amongst bond traders for many years remain important but the growing volatility of credit spreads has pushed them into second place. As with codified trading conventions, it may be that if the use of interest rate futures has become so ingrained in trader behaviour that they no longer consciously recognise the degree of its importance. Additionally, futures and OTC IRS are both used as interest rate hedging techniques so it could be argued that their combined score outweighs the use of OTC CDS which have been the main means of credit hedging other than shorting an issuer's or similar issuer's bonds. Sell-side traders will have easier access to, and lower transaction costs for, using OTC interest rate swaps (generally with their own in-house swap desk) than do investors so their higher rating amongst buy-side traders is surprising.

While trading platforms are considered important for both buy and sell-side the content of the questionnaire did not adequately list available platforms for us to make safe conclusions about specific platforms. This is an area of importance to be addressed in future surveys.

	All	Sell	Buy
22 **Listing (if and where)**	5.8	5.3	7.0
Dublin	1.0	1.0	1.0
London	1.7	1.0	2.3
Luxembourg	2.2	1.7	2.7
Other EU	1.0	1.0	1.0
US	0.6	-1.0	1.7

Given the use of listing factors in investment mandates, listing of course ranks more highly for investors than sell-side traders. The clearly expressed preference for a Luxembourg listing both amongst traders and investors should be explored further in follow up surveys. No doubt familiarity is a factor here as with depositories. The negative perception of US listings amongst traders is also a matter to be explored. A number of traders declined to answer the subsidiary questions in this section.

	All	Sell	Buy
23 **Depository**	4.4	3.6	7.0
International (Euroclear/Clearstream)	4.1	3.8	4.7
Domestic (EEA)	-0.7	-1.0	-0.3
US (DTC)	0.3	0.3	0.3
Domestic other	-2.6	-3.3	-1.7
Global	3.4	3.2	3.7

We have already identified the discrepancy between buy and sell-side on the question of depositories. Perhaps even more significant is the large discrepancy between the ICSDs and global structures on the one hand and domestic depositories on the other hand. The difference here is highly significant. It may be tempting to suggest that because the respondents were European traders they are biased in favour of the two ICSDs, Euroclear and Clearstream, who will also act as depositories together with the US based DTC for global issues. The poor rating given to domestic EEA depositories belies this argument. This perhaps should send a clear message to the ECB.

Funding

A5 **Funding**	All	Sell	Buy
42 Ability to borrow stock/reverse repo	8.1	8.3	7.0
39 Central bank repo eligibility (open market operations)	7.8	7.7	8.0
43 Ability to lend stock/repo	7.5	7.6	7.0
40 Eligibility for central bank liquidity facility	6.8	7.2	5.0
44 Inclusion in repo baskets	5.7	5.9	5.0
45 Unhedged cost of carry	5.2	5.4	4.0
41 Eligible collateral for RTGS	4.7	5.2	0.0
46 Hedged cost of carry	4.4	4.8	2.5

It is no surprise that funding is a more important factor for the sell-side than the buy-side. The one exception to this is Central Bank repo eligibility (i.e. in open market operations). It is possible that many investment mandates follow Central Bank eligibility criteria. Certainly regulatory categories, such as eligible liquidity for banks, will follow CB eligibility criteria.

Inclusion is repo baskets should probably be more important though it is possible that traders are not fully cognisant of the technicalities of the repo market which tend to be highly specialised.

	All	Sell	Buy
39 **Central bank repo eligibility (open market operations)**	7.8	7.6	8.3
ECB	3.9	3.9	4.0
BoE	3.6	3.5	3.7
Fed	3.0	3.0	3.0
SNB	1.7	1.3	2.0
Other CB of currency	1.6	1.3	2.0

As would be expected, central bank eligibility comes high on the list of factors. It seems surprising that eligibility for open market operations is higher than eligibility for special liquidity facilities (below) but the former list will tend to be more exclusive than eligibility for special liquidity facilities and its impact more ingrained than the recently introduced special liquidity facilities. The relative importance of the ECB and the Bank of England no doubt reflects the European bias of the survey; - none the less the Fed ranks highly. It should be remembered that the Fed operates, in normal times, mainly through system purchases of Treasury securities. Its open market repo activity is relatively limited in size and in the range of securities accepted.

	All	Sell	Buy
40 **Eligibility for central bank liquidity facility**	6.8	6.9	6.7
ECB	4.0	3.7	5.0
Fed	3.6	3.3	4.0
BoE	3.5	3.3	4.0
SNB	2.5	1.7	5.0
Other CB of currency	2.0	1.3	4.0

The high ranking of the ECB reflects not only the fact that the survey is European based but also the fact that the ECB was the first to introduce special liquidity facilities.

Issuer behaviour

A6 **Issuer behaviour**	All	Sell	Buy
51 Issuer's willingness to reward market making with new issue mandates	6.5	6.9	4.5
52 Issuer's sensitivity to secondary market conditions in timing new issues	6.3	6.4	6.0
49 Issuer's willingness to buy back	6.0	6.2	5.0
50 Issuer's willingness to lend stock	4.8	5.0	4.0
48 Firms relationship with issuer	4.5	4.2	6.0

In the fixed income market, issuers' relationships with investors tend to be at arms' length and intermediated by investment banks. It is therefore not surprising that the sell-side rates issuer behaviour more highly, in general, than does the buy-side. Nonetheless given the stated objective of buy-side firms to encourage market making and encouragement for issuers to reward sell-side market making with new issue mandates it is, if not surprising, then at least discouraging that buy-side firms do not see this as an important factor in liquidity. Sensitivity of issuers to secondary market conditions does, however, rank fairly highly with both buy-side and sell-side traders. Insider trader rules should ensure that both sets of traders are equally ignorant of issuers' discussions with investment banks about prospective new issues and they are both susceptible to issuers launching at a time when traders are holding inventory. Buy-side portfolio managers will be even more sensitive than sell-side traders to a fall in portfolio values as a result of over issuance. The real surprise in this section is that buy-side participants apparently rate their relationship with the issuer more highly than do sell-side. If this is so then it is a lesson to issuers of the importance of investor road shows, which generally are the only issuer contact with buy-side, at least in the fixed income market. It is likely that this reflects the relative importance of the issuer's name and credit to buy-side portfolio managers and less interest in the actual behaviour of the issuers which tend to impact sell-side traders more directly. Investors should have more interest in issuer behaviour, not least because this impacts the willingness of sell-side traders to provide liquidity.

Conclusions

We believe that a survey of this type is at least a useful supplement to econometric studies but also that it should lead to future econometric work. It is hard to say whether it would be possible or desirable to assign liquidity ratings to bonds. We think on balance that a form of

such ratings is inevitable as econometric and survey studies of bond market liquidity expand and more clarity and consensus arises around the three questions:

1. What is liquidity?

2. How do you measure it?

3. What factors affect it?

This survey focuses on the last question and assumes that traders understand and have a common view about what liquidity is, if not precisely how it is measured. Regulators and liquidity managers need to understand liquidity better. Of course liquidity will vary over time, and more importantly different investors will have a different perspective of it. One of the issues which have come into focus since the crisis is the degree to which bank liquidity portfolios held interbank liabilities. In normal times these are very liquid, but during a banking crisis they are the least desirable instrument to hold.

There are two broad areas in which we would like to draw conclusions from this initial pilot study.

A. What conclusions can be drawn from this study itself about the factors that contribute to the liquidity of financial instruments?

B. How can the survey be modified and expanded in order to better determine these factors as well as casting light on questions 1 and 2 above?

A. <u>Conclusions from the study.</u>

a. Public Policy

i. Ability to short issues and availability of CDS for hedging are key independent factors in determining liquidity. Regulators and politicians need to take note of this.

ii. Post-trade transparency, if not a negative factor, is of far less significant as a contributor to liquidity than pre-trade transparency.

iii. Transaction costs rank poorly with both buy-side and sell-side traders. This may reflect trader ignorance but in modern firms traders should see clearly the effect of transaction costs in their bonuses.

b. Traders are conservative. Established benchmark status will often count more than other apparently important factors.

c. Any econometric study of liquidity must distinguish between publicly and privately issued instruments. More clarity on what traders understand by these concepts should be obtained.

d. The top ten factors include three factors each from "*market environment*" and "*funding*", two from "*valuation and transparency*" and one each from "*issue static data*" and "*trading infrastructure*".

e. The low ranking of "*age*" and "*size of issues*" needs to be investigated.

f. Market participant indicate a significant preference for Luxembourg listed instruments and for Euroclear/Clearstream as depositories (as well as global format). Is this simply a result of familiarity?

g. Investor attitudes

i. "*Market maker support (no. of declared market makers)*" ranked 11 overall and "*standardisation of structure and documentation*" ranked 8 overall but are only ranked 24 and 16 respectively by investors. These are both areas which investors should perhaps rate more highly and it will be interesting to see how in subsequent surveys the buy-side ranks these factors. It is probable that the crisis has forced the issues to the attention of investors. On the other hand investors may have decided that declared market makers are not true market makers in a crisis.

ii. Similarly issuer factors such as their "*willingness to reward market making in new issue mandates*" (ranked 37 by investors) and "*sensitivity to secondary market conditions*" (ranked 28 by investors) should rank more highly amongst investors as no doubt should issuers willingness to buy back stock. This latter factor is very much a function of the liquidity position of the issuer.

B. <u>Lessons for future studies</u>

a. The survey needs to take in a much greater number of traders covering adequate samples of the different types of firms and markets listed in the questionnaire (Annex 1). At least 50 traders with a 75-25% split between sell-side and buy-side need to take part.

b. To the extent that they still exist, we should include a reasonable sample of structured product traders and design more specific questions for them.

c. A survey of New York and possibly Asian traders would provide interesting comparisons.

d. More detailed questions about measures and definition of liquidity should be asked. A ranking of different measures would be helpful here. Average trade size is probably more a measure of liquidity than a contributory factor.

e. Care should be taken to vary positive and negative contributors to liquidity in the questionnaire.

f. Clarification of repo market practice should be sought and incorporated in questions.

g. Clarification of concern about depositories should be sought.

The relationship between answers on Categories, Factors and sub-Factors, as greater detail is elicited in the Questionnaire, needs to be investigated.

Less liquid issues require greater sales intensity by sell-side firms. A survey of sales intensity (turnover per salesperson) might be a useful measure of liquidity.

Bibliography

Biais, B., F. Declerck, J. Dow, R. Portes, E.-L. von Thadden – 2006 - European Corporate Bond Markets: transparency, liquidity, efficiency.

Bao, J., J. Pan and J. Wang - 2008 - Liquidity of Corporate Bonds – Draft.

Bessembinder,H., W.F. Maxwell, K.Venkataraman - 2005 - Market Transparency, Liquidity Externalities, and Institutional Trading Costs in Corporate Bonds.

Edwards,A.K., E.H. Harris, and M.S. Piwowar - 2007 - Corporate Bond Market Transaction Costs and Transparency.

Goldstein,M.A., E.S. Hotchkiss, E.R. Sirri – 2006 - Transparency and Liquidity- A Controlled Experiment on Corporate Bonds.

Huang, R., and H. Stoll – 1997 - The components of the bid-ask spread: A general approach, *Review of Financial Studies* 10, 995-1034.

Laganá,M., M. Peřina, I. von Köppen-Mertes and A. Persaud – 2006 - Implications For Liquidity From Innovation And Transparency In The European Corporate Bond Market - ECB Occasional Paper Series No. 50/ August 2006

Mackintosh, I. -1995 - Liquidity ratings for bonds - CSFI

Madhavan, A., M. Richardson, and M. Roomans – 1997 - Why do securities prices change? A transactions level analysis of NYSE-listed stocks, *Review of Financial Studies* 10, 1035-1064.

Schultz, P., 2001, Corporate bond trading costs: A peek behind the curtain, *Journal of Finance* 56, 677-698.

SURVEY OF FACTORS AFFECTING LIQUIDITY IN FIXED INCOME TRADING

The survey is sponsored by the International Capital Markets Association (ICMA) and by the European Federation Financial Analyst Societies (EFFAS)

FIRM AND TRADER DETAILS

Firm code= Trader no.= (to be completed by interviewer)

Firm name (optional): Trader name (optional):

The purpose of this survey is to establish the criteria by which you and your peers judge the liquidity of the financial instruments that you trade. As a provider or user of liquidity you ultimately determine which instruments you are prepared to hold on your books and those in which you are prepared to run short positions.

Completion of the survey should not take longer than 30-45 minutes.

Please indicate the nature of your firm (tick **one** only):

- Investment bank
- Universal bank
- Investment manager*
- Insurance company
- Publicly owned bank
- Other-please specify

* Indicate parent group if >50% of mandates are from parent

Are you (tick **one** only) :

- A market maker ?
- Liquidity manager/trader ?
- Portfolio manager/trader ?
- Repo trader ?

What instruments do you trade ? (tick **all** that are applicable)

- Head trader
- Rates
- Government bonds only
- SSA
- Credit
- Credit high yield
- Emerging market currencies
- Emerging market issuers
- Structured products
- Money markets

MARKET LIQUIDITY

How do you rate overall current market liquidity conditions? Score 10 to 0.

0 No market (dealers won't even answer the phone...)
1 Order basis only for all bonds in the sector
2 Order basis only for many but not all bonds
3 Very difficult trading conditions
4 Quite tough to get size away without an order
5 Normal: standard size trades on standard spread
6 Quite good: extra size or tighter spread possible
7 Liquid: good size for best issues and competitive bid/offers
8 Very liquid: active market and tight bid/offers
9 Extremely liquid: very active market, large size and tight bid/offer for most issues
10 Hyper liquid: almost anything trades in size with very tight bid/offers

How do you feel market liquidity conditions will change in the short term (over next 3-months)? Please tick relevant box.

Improve
Deteriorate
No change

To what extent do you consider that relative turnover and volatility are an adequate description of the relative liquidity of a bond? Please tick relevant box.

<50%
50%-75%
>75%

SECTION A

Please score each of the major factors in section A from 10 (very important impact on liquidity) to 0 (no impact on liquidity).
The score from 0 to 10 should reflect **your evaluation of the absolute importance of that factor's effect on the liquidity** of the instruments you trade.

Subsidiary factors should be scored +5 (a very significant contributor to liquidity) to -5 (a very significant negative impact on liquidity).
The score from -5 to +5 should reflect **your evaluation the relative importance of the subsidiary factor within that main factor**.
Most of the subsidiary factors will be positive or neutral but they can be negative.

Section B will ask you to weight the major groups (e.g. A1 Issue static data, A2 Market Environment etc.)

Complete only yellow boxes with Scores or Weights and grey boxes where "Other" options are applicable.

REMEMBER YOU ARE ASKED TO SCORE EACH FACTOR AS A LIQUIDITY CONTRIBUTOR.

A1 Issue static data

1 Issue size

	Score 10 to 0	Score +5 to -5
EUR 10bn+		
EUR 5-9.9 bn		
EUR 1-4.9bn		
EUR 0.3-0.9bn		
<EUR 0.3bn		

2 Currency of issue

Score 10 to 0

Score +5 to -5

USD
EUR
GBP
JPY
CHF
Other developed
Emerging currency

3 Credit rating

Score 10 to 0

Score +5 to -5

AAA
AA/A
BBB
NIG

4 Time since issuance (or last tap)

Score 10 to 0

Score +5 to -5

<6mths
6-12 mths
1.1-5yrs
5.1-10yrs
>10yrs

5 Time to maturity

Score 10 to 0

Score +5 to -5

<1yr
1-5yrs
5.1-10yrs
>10yrs

6 Min denomination

(e.g. EUR 1,000 or EUR 50,000 or equivalent)

Score 10 to 0

Score +5 to -5

1
1,000
50,000+1
50,000
1,000,000

7 Public offering or private

Score 10 to 0

Score +5 to -5

Public
Private

8 Other issue static data (please state and score)

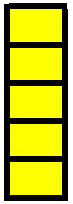
Score 10 to 0

A2 Market environment

9 Maturity and development of market

Score 10 to 0

Score +5 to -5



<1yr
1-2yrs
2-5yrs
5-10yrs
>10yrs

10 Benchmark issue

Score 10 to 0

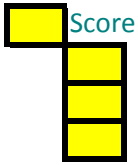
11 Turnover on recognised platforms or markets

Score 10 to 0

12 Issuer benchmarks (size and number)

Score 10 to 0

Score +5 to -5

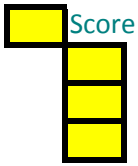


Score +5 to -5

In currency

1
2 to 5
>5

Score +5 to -5



In other currency

1
2 to 5
>5

13 Liquidity of benchmarks

Score 10 to 0

14 Average bid/offer spreads

Score 10 to 0

Score +5 to -5

Tight (1 yield bp or less)
Medium (2 yield bp or less)
Wide(5 yield bp or less)
Very wide (more than 5 yield bp)
Bid only
Offer only

15 Variation from par

Score 10 to 0

Score +5 to -5

Close to par (+/- 1/2% p.a. of remaining maturity)
Discount to par
Premium to par

16 Market maker support (number of declared market makers)

Score 10 to 0

17 Sector size

Score 10 to 0

Score 10 to 0

In currency
In other currencies

18 Investor diversity

Score 10 to 0

Score +5 to -5

Retail
Banks
Central banks
Insurance
Other AM
Hedge funds

19 Other (Please State and Score)

Score 10 to 0

A3 Market infrastructure

20 Trading platform (list platforms)

Score 10 to 0

Score +5 to -5

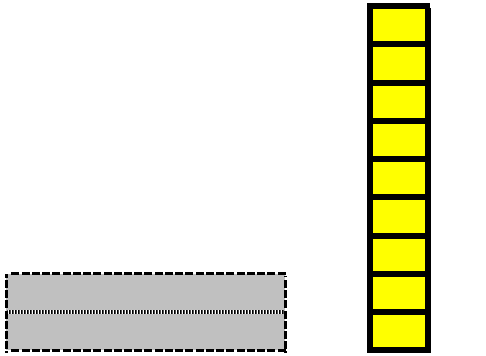
Brokertec
Euro MTS
Local MTS
Tradeweb
Others (please state)

21 Inclusion in indices

Score 10 to 0

Score +5 to -5

Barclays
iBoxx
JPMorgan
Lehman
Merrill
MSCI
ABX (structured/AB credit only)
Other (please state)

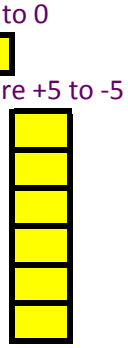


22 Listing (if and where)

Score 10 to 0

Score +5 to -5

Dublin
London
Luxembourg
Other EU
US
Other

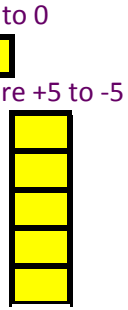


23 Depository

Score 10 to 0

Score +5 to -5

International (Euroclear/Clearstream)
Domestic (EEA)
US (DTC)
Domestic other
Global



24 Availability and transaction costs of derivatives for hedging

Score 10 to 0

Score +5 to -5

Interest rate futures

OTC IRS

OTC CDS

25 Deliverability into futures contract

Score 10 to 0

26 Codified trading conventions

Score 10 to 0

27 Transaction costs

Score 10 to 0

28 Withholding tax on coupons

Score 10 to 0

29 Other infrastructure (please state and score)

Score 10 to 0

A4 Valuation and transparency

30 Pre-trade price transparency — Score 10 to 0

31 Post trade transparency — Score 10 to 0

Real time (10 minutes or less but trade size capped) — Score +5 to -5
End of day (trade size capped)
End of next day (trade size capped)
One month or more delay

32 Availability of closing dealer quotes for valuation — Score 10 to 0

33 Availability of and/or dependence on comparable benchmarks — Score 10 to 0

34 Standardisation of structure and documentation — Score 10 to 0

35 Complexity and/or idiosyncrasy of structure — Score 10 to 0

36 Availability of information on underlying (structured/AB products only) — Score 10 to 0

37 Availability of public domain valuation models (structured products only) — Score 10 to 0

38 Other valuation and transparency (please state and rate) — Score 10 to 0

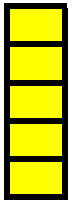
A5 Funding

39 Central bank repo eligibility (open market operations)

Score 10 to 0

Score +5 to -5

ECB
Fed
BoE
SNB
Other CB of currency

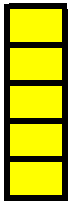


40 Eligibility for central bank liquidity facility

Score 10 to 0

Score +5 to -5

ECB
Fed
BoE
SNB
Other CB of currency

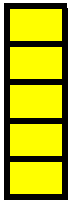


41 Eligible collateral for RTGS

Score 10 to 0

Score +5 to -5

ECB
Fed
BoE
SNB
Other CB of currency



42 Ability to borrow stock/reverse repo

Score 10 to 0

43 Ability to lend stock/repo

Score 10 to 0

44 Inclusion in repo baskets

Score 10 to 0

45 Unhedged cost of carry

Score 10 to 0

Score +5 to -5

Positive
Negative

46 Hedged cost of carry

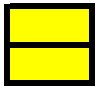
Score 10 to 0

Score +5 to -5

Positive
Negative

47 Other Funding Factor (please state and rate)

Score 10 to 0



A6 Issuer behaviour

48 Firms relationship with issuer — Score 10 to 0

49 Issuer's willingness to buy back — Score 10 to 0

50 Issuer's willingness to lend stock — Score 10 to 0

51 Issuer's willingness to reward market making with new issue mandates — Score 10 to 0

52 Issuer's sensitivity to secondary market conditions in timing new issues — Score 10 to 0

53 Other Issuer Behaviour Factor (please state and rate) — Score 10 to 0

END OF SECTION A: PLEASE CONTINUE WITH SECTION B

Section B

Please now weight the factors BY GROUP . The factors within groups have been repeated ONLY as a reminder of what is in each group and DO NOT NEED WEIGHTING, so please complete yellow boxes only. It is not mandatory that the weightings sum to 100%: a percentage weighting is calculated automatically.

	WEIGHT =>	%		
B1 Issue static data				
1 Issue size	2 Currency of issue		3 Credit rating	4 Time since issuance/tap
5 Time to maturity	6 Min denomination		7 Public or private	8 Other
B2 Market environment				
9 Maturity of market	10 Benchmark issue		11 Platforms/markets turnover	12 Issuer benchmarks
13 Benchmarks liquidity	14 Average bid/offer spreads		15 Variation from par	16 Market maker support
17 Sector size	18 Investor diversity		19 Other	
B3 Market Infrastructure				
20 Trading platform	21 Inclusion in indices		22 Listing	23 Depository
24 Derivatives for hedging	25 Futures contract deliverability		26 Codified trading conventions	27 Transaction costs
28 Withholding tax on coupons	29 Other			
B4 Valuation and transparency				
30 Pre-trade price transparency	31 Post trade transparency		32 Closing dealer quotes	33 Comparable benchmarks
34 Standardisation of structure	35 Structure Complexity		36 Information on underlying	37 Public domain valuation models
38 Other				
B5 Funding				
39 CB repo eligibility	40 Central bank haircut		41 Other repo eligibility/haircut	42 Ability to borrow stock/reverse repo
43 Ability to lend stock/repo	44 Inclusion in repo baskets		45 Unhedged cost of carry	46 Hedged cost of carry
47 Other				
B6 Issuer behaviour				
48 Relationship with issuer	49 Issuer willing to buy back		50 Issuer willing to lend stock	51 Issuer rewards market making
52 Sensitivity to market in new issues			53 Other	

Do you want to change your weightings?

Total all groups

The causes of bond market liquidity-a survey of market traders

David Clark and Chris Golden[1]- draft report February 2009[2]

Introduction and summary

The subject of liquidity is one which has in the past largely been of academic interest. Recently, more sophisticated participants in the fixed income markets have developed liquidity arbitrage models but these tend to be proprietary[3]. Recent events in financial markets have highlighted the practical importance of liquidity, particularly when it disappears. And since the disappearance of liquidity can have such a dramatic impact on the normal function of those financial markets the topic has become of major interest for regulators and other authorities concerned as well as liquidity managers.

The numerous academic studies consecrated to market liquidity are frequently enlightening. But market consultation is of course of primordial importance when addressing possible changes in the structure or working of those markets. The authors of this study further believe that in the specific case of market liquidity, the practical decision-making authority of market-makers in that realm suggests that a survey of the factors which these market participants take into account when deciding how to apply liquidity in practice is crucial in evaluating how to maximise the liquidity of a market.

---

[1] The authors:

David Clark is Managing Director of Belair Advisors sàrl, a Luxembourg company specialising in public affairs consulting covering principally financial markets and health care issues. He started trading swaps in 1984 graduating as a sell side fixed income manager. More recently he was a head of funding at the European Investment Bank where he worked for 10 years designing and implementing bond issuance strategies. He was a member of the UK FSA working group on bond market transparency.

Chris Golden is Chairman of EFFAS-EBC, an association of professional bond analysts. He has worked in numerous trading rooms, including those of Goldman Sachs, Lehman Brothers and Nomura, as trader, salesman and head of research, as well as an independent consultant to a number of banks, government agencies and fund managers, including UBS, the European Investment Bank, Agence France Trésor and Flemings.

[2] The survey is based in interviews carried out in June and July 2008. The study was sponsored by the International Capital Market Association and by the European Federation of Financial Analyst Societies-European Bond Commission, for which the authors express their gratitude. The authors, however, have had complete independence and the conclusions of the study and the views expressed are entirely those of the authors.

[3] Some of these models will frequently trade off volatility in the relevant equity markets. Others, such as the one notoriously used by Citibank London in August 2004, seek to arbitrage liquidity between different trading venues.

V1. 090219

This study does not directly address factors affecting overall market liquidity such as the availability of capital to market making or changes in risk capital resulting from volatility and changing correlations. There is no doubt however that these factors impact the relative liquidity of instruments as well as relative credit spreads. It is also the case that factors that impact the relative liquidity of instruments will impact overall liquidity, particularly if broad market behaviour and regulatory practice recognise and act upon them.

This paper thus describes a pilot survey of market participants directly involved in allocating liquidity and directly affected by it. The results of this pilot survey both indicate that there are important regulatory conclusions to be drawn from this approach, and highlight the importance of expanding the scope of such a survey. Further surveys are therefore imperative, and should address a much greater number of market participants, be more widely distributed geographically, and cover a wider range of instruments. Finally these surveys should occur regularly, at least once a year if not more frequently.

Even when using a small market sample as we do here, a number of conclusions of importance both to markets themselves and to regulatory authorities particularly stand out, especially, but not only, in the following areas:

1] The ability to short issues and the availability of CDS are considered key to liquidity by market participants.

2] Post-trade transparency is NOT considered to be a significant contributor to liquidity, and is certainly much less so that pre-trade transparency.

3] Transaction costs are considered to be somewhat irrelevant by both buy-side and sell-side traders.

4] The distinction between privately and publicly issued instruments is paramount.

Recent problems in the bond markets have highlighted the importance of liquidity for the proper functioning of those (and arguably all) markets. But although there is a large body of work that attempts to estimate the weight of perceived liquidity in the valuation of corporate bonds, as well as some research decomposing that weight into factors that can be seen as influencing the price of liquidity, we have found very little research on what affects the provision of liquidity[4]. Furthermore we have only found one (non-academic) paper dealing with market perceptions of liquidity[5].

Bao, Pao and Wang conclude their paper, "Liquidity of Corporate Bonds"[6] with the following comments.

[4] Laganá, Peřina, von Köppen-Mertes and Persaud (2006)

[5] Mackintosh (1995)

[6] Bao, J., J. Pan and J. Wang (2008)

"Our results raise several questions concerning the liquidity of corporate bonds. First, what are the underlying factors giving rise to the high level of illiquidity? This question is particularly pressing when we contrast the measure of the illiquidity in the corporate bond market against that in the equity market. Second, what causes the fluctuations in the overall level of the illiquidity in the market? Are these fluctuations merely another manifestation of more fundamental risks or a reflection of new sources of risks such as a liquidity risk? Third, does the high level of illiquidity for the corporate bonds indicate any inefficiencies in the market? If so, what would be the policy remedies? We leave these questions for future work."

This study is designed as a pilot for a future study of those underlying factors. It is not an econometric study; it is a survey of dealer opinion. It may serve as an alternative approach to econometric studies or as a guide to future econometric work, or both. The basic premise supporting the study is that traders, whether market makers (sell-side) or traders in investment firms (buy-side), who are respectively the providers of liquidity and the users of liquidity, are likely to have the best insight into the factors that contribute to liquidity. Market makers are granted a limited amount of risk capital to carry on their business but the decision on how to allocate this capital to different instruments is very much their own, subject to the application of financial risk models. Buy-side traders will be influenced by different factors, most notably the wording of investment mandates. Identifying factors which traders believe are important should help econometricians to focus on the most relevant of the broad array of potential and actual influences on market liquidity. A survey study such as this one may also undoubtedly benefit from previous econometric work and the authors are preparing a review of this corpus as part of the further development and implementation of their survey approach.

In order to carry out the study, a questionnaire was designed and presented to traders in London, Luxembourg and Paris. There was no science in the choice of centres and a full study of European markets would certainly include Frankfurt and Milan, among others. In addition a study of US and Asian markets would be likely to throw up contrasting views. Each interview took about 30 minutes and was carried out face to face by one or other of the authors. This limited the number of interviews which were able to be conducted for this pilot study, and initially 15 interviews were carried out: 5 buy-side and 10 sell-side. One set of results was lost and two discarded as statistical outliers, leaving a sample of 12: 3 buy-side and 9 sell-side. Given the range of markets, products and firms covered, this sample cannot be considered sufficient to produce definitive or statistically robust results in general. None the less some significant and interesting results did emerge.

The top five factors seen to impact relative liquidity were:

1. Whether instruments were issued publicly or privately.

2. The liquidity of the relevant benchmarks.

3. The ability to borrow stock in order to run a short position.

4. Whether the issue itself is a benchmark issue.

5. The availability of and transaction costs of derivatives for hedging

Amongst the relevant derivative hedging instruments listed, Credit Default Swaps (CDS) were considered the most important.

Such results can have important policy implications. The ability to short stock and the capacity to hedge with CDS are both clearly vital for liquidity, and yet these are two areas which have drawn the greatest public and regulatory criticism. The contrast between their practical importance to market participants and their negative image in the public sphere also highlights how crucial it is to better inform those outside the markets as to how these instruments work, and why they are vital for markets to function optimally. Potential regulations if poorly designed might well limit the ability of traders to short or to use CDS; alternatively if well designed they could instead improve the orderliness of the market. In addition the credit environment has led investment institutions to become more reluctant to lend stock. We are not aware that any of the top five factors seen to impact liquidity has been the subject of significant econometric studies.

Other results with important implications for regulators are the low ranking of post-trade transparency relative to pre-trade transparency - discussed in greater detail below - and the fact that transaction costs are rated low down the scale for both buy-side and sell-side.

Investors should be concerned by the poor rankings they give to certain issuer behaviour, and to issuers rewarding market-maker support with new mandates, as well as by the lack of focus on the standardisation of both structures and issue documentation.

Probably the clearest conclusion is that relative liquidity is a function of existing benchmark status. Traders are naturally conservative and are reluctant to change whose issues they will use as a benchmark, particularly for hedging and valuation purposes. Once benchmark status is obtained it is hard to dislodge. This of course benefits those bonds which have benchmark status but the existence of a liquid benchmark may also improve liquidity of other bonds in the sector which can be priced, traded, or even hedged, with reference to the benchmark. "*Availability of and/or dependence on comparable benchmarks*" however is ranked at only 33 when included in the Category "*Transparency and Valuation*". This seeming discrepancy needs to be investigated further and the questionnaire perhaps redesigned in order to clarify it.

Another surprising aspect of the responses obtained is that issue size and age of issue rank only 15 and 30 in the list of factors. It is of course possible that these two factors help determine benchmark status and a question addressing this issue should be included in any future survey.

Generally we found that traders welcomed the questionnaire and found the exercise a useful one in trying to address the range of factors which possibly many of them hitherto only rated instinctively. Perhaps not surprisingly senior traders were more considered in their responses than junior ones.

Measuring liquidity

There are three key questions regarding the liquidity of markets: what is it? how do you measure it? and what factors affect it?

The liquidity of a financial instrument may be described as the ability to trade that instrument in reasonable size, promptly, and at a price which is close to the mid-market quoted price without unduly changing that price (however some of these terms may be defined). Temporary dislocations in market price as a result of a trade are also a measure of illiquidity.

Since it is difficult, if not impossible to observe liquidity directly, much research on the subject focuses on possible proxies. The two proxies for liquidity that most often occur in the literature are the bid-offer spread and the turnover of a bond. A typical conclusion resulting from the assumption that these two characteristics are proxies for liquidity is that a bond is more liquid when it has been recently issued than when it ages. We believe that there are difficulties attached not only to the use of either or both proxy measures as reasonable indicators of liquidity, but also to the conclusion just stated derived from those assumptions.

It is frequently the case particularly in academic studies that the bid-offer spread is taken as a proxy for liquidity, with liquidity assumed to increase as the spread narrows. The reasons are compelling, and in theory at least convincing. Such assumptions may be particularly valid in equity markets. But in practice in bond markets the bid-offer spread is effectively unobservable. Studies which use the bid-offer proxy often construct a method for extracting the bid-offer spread of a bond from a series of actual trade data.

For example, Goldstein et al estimate bid-offer spreads using regression estimates of the difference between transaction prices and the previous day's estimated bid price. Edwards et al acknowledge the difficulty of observing bid-offer spreads in the bond market, using an econometric model to derive these spreads from transaction data. Bessembinder et al also estimate bid-offer spreads using a method comparable to those suggested by Huang and Stoll, Madhavan et al, and Schultz.

There are practical reasons why one cannot observe the bid-offer spread of a bond price in time by using published transaction data. For example trades can take place on a one-way price (where the client "opens up" to the trader, in the belief that this will result in an improved price for his/her transaction), and which does not reflect the trader's "normal" price at the time; trades can seem to take place at a loss or no gain (when compared to the previous price), but in fact be part of a package of trades which are profitable overall; traders can also immediately sell a position acquired from a client (or vice versa) for a small loss, in order to provide liquidity to a very good long-term client; or a trade may give a totally false impression of its P/L because of its hedge (which of course need not be in the form of another reported bond); and so on. Small retail trades will incorporate a commission in the price (unlike equity trades) which greatly distorts the traded prices. All of these variations augment the noise content of published transaction prices. In short there are numerous reasons why the raw data derived from a trade-reporting system (even when accompanied by an indication as to whether the trade was a purchase or a sale) are intrinsically inadequate to give a reasonable picture of underlying bid-offer spreads: such derived bid-offer spreads may be better than nothing, but they should be treated with caution and their level of precision assumed to be low. The use of such derived spreads to draw further conclusions must be treated with a level of scepticism in proportion to the stated level of accuracy of such conclusions.

In addition, the practical relationship in the market between specific trader bid-offer spreads and liquidity is far from obvious: the lowest bid-offer spread to be found in a market is almost inevitably composed from two sources – the best bid found and the best offer. While in the past this optimal price may have incurred some search costs, this is increasingly no longer the case where computerised trading platforms are doing the searching. In other words the best bid-offer spread in the market will seldom be found by consulting one single trader.

The case for turnover as a proxy for liquidity is also convincing at first; but it fails to convince at last. In fact an examination of the question should lead to the conclusion that a bond with high turnover does indeed have reasonable liquidity: but it hardly follows from this conclusion that a bond with low turnover has low liquidity. The only true conclusion from the observation that a bond has low turnover is that it seldom trades. The test of liquidity is not that a bond trades often, but that when it does so, it trades in a liquid manner: i.e. promptly, in size, at the market price and without unduly disturbing the market. It is perfectly possible therefore for a bond to trade rarely but still to have very good liquidity when it does trade. As discussed below inter-dealer market making obligations often lead to artificial liquidity and excess inter-dealer turnover. At the very least inter-dealer turnover should be considered separately from investor turnover. CDS frequently result in falling turnover for matching cash bonds as dealers and investors use these as a surrogate for the cash. This fall in turnover does not necessarily imply lower liquidity, in fact it is more likely to coincide with increased liquidity.

As a result, the conclusion that a "young" bond is inherently more liquid than an older bond is partly erroneous: that bonds have high turnover in the period immediately following their issuance largely reflects the distribution process. The initial placement of bonds is seldom final: during the period following a new issue bonds will very often trade relatively frequently as they move from initial "weak" holders to their longer-term "firm" holders.

It should be noted that this study has not set out to define the liquidity of a bond or how it is measured, though we are clearly interested in the subject. We have largely left it to interviewees to have their own concept of liquidity. We have asked one question each about current and future liquidity conditions for the purposes of calibrating this survey (and future ones) to market conditions, as well as one question about the possible describers of liquidity and future surveys may address these questions in more detail. Relative liquidity between bonds is likely to diverge in times of low market liquidity and compress in times of high market liquidity. **The primary purpose of the survey is to establish what factors contribute to or detract from liquidity based on the interviewees' own understanding of what that liquidity is.**

Designing the study

There are two possible approaches towards determining what factors contribute to the relative liquidity of instruments. One is to attempt an econometric study, and a review of academic literature in this area is being conducted by the authors. But econometric studies have a number of problems. In the first place the factors which impact liquidity are likely to evolve with time and changing market circumstances. No such studies have been carried out consistently over time - though the same can be said of market surveys. In addition the factors are likely to be so diverse that it is almost impossible to identify specific causes. For example, certain studies such as Goldstein et al have sought to identify the impact of one factor, such as post-trade price transparency. Goldstein et al studied a number of pairs of similar bonds: one which is subject to post trade transparency; the other not. One problem with this approach is that it presumes that the impact of post-trade transparency will become apparent during the course of the study. But fixed-income traders can be extremely conservative, and whilst they may be aware that one bond is subject to post-trade transparency and the other not, they will not necessarily change their behaviour in the short term. This conservatism is reflected in the

fact that once a bond or group of bonds, often issued by the same issuer, has established benchmark status it is extremely difficult to dislodge them from that position. It probably results from the fact that the many different participants in the market (different types of investors, market-makers, traders, repo traders, regulators, as well as those who design and implement trading and information systems) do not have perfect knowledge of each others' motives and methods. In short, changing the behaviour of the market can be extremely hard, and in any case takes time. This explains why the existence of a benchmark reference, and whether an issue is itself a benchmark, are rated as two of the top five factors in determining relative liquidity. Benchmark issues do lose their status from time to time, but the process is slow and the status will usually move to a more current bond launched by the same issuer.

Issuers can and do try to influence the benchmark status of the bonds that they issue. An important part of that process is the consistency of issuer behaviour over a long period. But many traders will not be fully familiar with the history of issuance. They will come into a market with established benchmark issues and those will remain the benchmarks until they and others decide to change them. This process of change is hardly a consciously concerted one, but evolves in line with group dynamics.

It should in theory be possible to identify the impact of issue size on liquidity yet there are immense hurdles in designing an experiment that will show this. Because of the numerous other factors which influence market liquidity many asset-backed or structured issues of a €1 bn. in size trade considerably less frequently than may a popular retail issue with a size of €300 mn., There are simply too many factors at play to isolate any single factor easily.

The approach taken in this study is to identify as many factors that might impact liquidity of fixed income instruments as possible, to assemble them into a questionnaire and to ask market participants to score or rate the factors. There are of course a number of potential pitfalls in this approach. Two such pitfalls may be found in the design of the questionnaire (which must be neutral), and the identification of as many relevant potential factors as possible (for a comprehensive list of factors). Another is to choose factors that are in some way measurable for the survey to be useful.

The Structure of the Survey

The survey is broken down into three elements. Forty seven potential factors were selected which were divided into six broad categories:

Issue static data;

Market environment;

Market infrastructure;

Valuation and transparency;

Funding;

Issuer behaviour.

Interviewees were asked to rate each factor from 0-10 based on that factor's impact on the relative liquidity of instruments, whether positive or negative.

Within a number of these factors interviewees were asked to evaluate the impact of subsidiary elements of the factors based on a score of -5 to +5. For example within the factor, "*Issue size*", issues over EUR 10 bn score +2.9 out of 5 and below EUR 300 m score -3.5 out of 5, indicating that the fact that an issue's size is larger than EUR 10 bn contributes to its liquidity, whereas a size of less than EUR 300 mn actively detracts from its liquidity.

The factors were selected based on the authors' knowledge and experience of the market as issuer, traders and analyst, as well as past studies of the market. While we attempted to be as comprehensive as possible, even including factors which we did not think would have much impact, inevitably some factors will have been missed or otherwise poorly expressed. Questions relating to trading platforms or inclusion in indices may have suffered through not listing all the most important trading platforms or indices in the subsidiary questions.

The manner in which questions are asked within the questionnaire is clearly important. For instance most of the factors can be assumed to have a positive impact but some may have a negative impact. Respondents may have answered assuming they were measuring the positive impact rather than a negative impact. In the analysis of the study we focus particularly on how the questionnaire may be improved in the future.

Liquidity Survey Results[7]

Preliminary Questions (Calibration etc)

We set the scene by asking the trader how they rate overall current market liquidity conditions, on a score of 0 to 10 where:

0 No market (dealers won't even answer the phone...)
1 Order basis only for all bonds in the sector
2 Order basis only for many but not all bonds
3 Very difficult trading conditions
4 Quite tough to get size away without an order
5 Normal: standard size trades on standard spread
6 Quite good: extra size or tighter spread possible
7 Liquid: good size for best issues and competitive bid-offers
8 Very liquid: active market and tight bid-offers
9 Extremely liquid: very active market, large size and tight bid-offers
10 Hyper liquid: almost anything trades in size with very tight bid-offers

The interviews were carried out in June and July of 2008 – well before the events of October 2008.

	All	Sell	Buy
Market Liquidity	3.5	3.7	3.0

[7] In the tables a reference number precedes Categories and Factors. This refers to their position in the questionnaire. Each Category and its respective factors are colour coded in the questionnaire and in the results. The questionnaire is attached Annex 1

Buy-side appeared to have a slightly poorer view of liquidity conditions than did sell-side traders. As users of liquidity they may have a better view of liquidity conditions. But overall liquidity conditions were considered to be midway between "Very difficult trading conditions" and "Quite tough to get size away without an order".

We also asked traders "How do you feel market liquidity conditions will change in the short term (over next 3-months)? 1. Deteriorate(scores 1); 2. Remain the same(scores 2); 3. Improve(scores 3)." There was a significant bias in favour of improved conditions.

	All	Buy	Sell
Future Liquidity	2.8	2.7	3.0

As future surveys are likely to be impacted by conditions existing at the time this provides a useful calibrator of how results are affected by existing and prospective liquidity conditions.

We then asked traders "To what extent do you consider that relative turnover and volatility are an adequate description of the relative liquidity of a bond? 1. <50%(scores 1); 2. 50-75%(scores 2); 3. >75%(scores 3)."

	All	Sell	Buy
Importance of T/O, Vol	2.1	2.1	2.0

The clear response was that these measures described 50-75% of the relative liquidity of a bond. Future surveys may ask traders what other measures describe liquidity, such as bid-offer spreads, which are often seen as a proxy measure of liquidity or autocovariance of prices as used in Bao et al. It is important here to distinguish between factors that describe rather than contribute to relative liquidity.

Categories

	All	Sell	Buy
B2 Market environment	21%	21%	18%
B1 Issue static data	18%	18%	18%
B4 Valuation and transparency	17%	17%	19%
B3 Market Infrastructure	17%	17%	18%
B5 Funding	14%	14%	12%
B6 Issuer behaviour	13%	13%	14%

Overall evaluation of the categories was made at the end of the survey after dealers had answered questions on each factor.

General

A key distinction between the outlooks of sell-side and buy-side participants lies in their holding period horizons. Sell-side dealers do not expect to hold positions for very long and generally for less than 24 hours; whereas portfolio managers for whom buy-side dealers work generally expect to hold their positions indefinitely, and certainly for significantly longer than 24 hours.

As a result, it is significant but not surprising that sell-side rate market environment at the top while buy-side rate valuation and transparency most highly. Portfolio valuation is of course a

key area for buy-side investors and they will tend to have much larger portfolios relative to their market turnover than do sell-side dealers. Sell-side dealers on the other hand will focus much more on current market environment - which determines their next trade rather than more post-trade related issues. It is also probable that most sell-side traders have greater access to more valuation tools than do most buy-side traders. Large buy-side traders, however, are likely to have access to information from a wide variety of sell-side firms, information which is obviously not available to a single sell-side firm. Other differences are the slightly higher rating given to issuer behaviour by buy-side when answering questions on categories at the end of the survey and the higher rating given to funding by the sell-side. Issuer behaviour is likely to impact the longer term value of issues and hence be of relatively more importance to buy-side investors with their longer horizons; while funding is clearly of importance to sell-side dealers. In the analysis of factors comprising issuer behaviour our buy-side sample tended to rate issuer behaviour lower than do sell-side. This discrepancy between investor attitudes in general and their attitude in particular is a familiar story. Investors give lip service to issuer behaviour but do not follow up the implications of their expressed views in practice. Of course the investor sample is too small to implicate the investor community in general but there is a familiar ring to the survey result. No leveraged buy-side investors were interviewed and they would naturally give a higher weighting to funding. While the investor sample used is particularly small it is very important to recognise the differing factors which buy-side and sell-side will consider of importance. The presumption of this survey is that it is the providers of liquidity, sell-side dealers, who are the determinants of liquidity provision; but that buy-side investors may well force the issue in certain conditions by demanding liquidity in certain issues.

Finally and perhaps most significantly, issue static data is not considered the most important contributor to relative liquidity. This category includes factors such as size and age of a bond which are often considered the most important contributors to liquidity. They are rated respectively 15th and 30th in the rankings of factors. This is certainly a puzzling result but even granted the small sample size and the difficulties in designing the questionnaire the results seem to be significant. What follows most importantly from this result is that liquidity is not static but is, as one might surmise, dynamic; and that the inherent (static) characteristics of an issue do not contribute as much to its liquidity as may be supposed.

Subsidiary questions (sub-factors)

The range of results for subsidiary factors may well better indicate the importance of the factor. For instance, results for the sub-factors relating to "*Bid-offer spread*" which are measured on a scale from -5 to +5, range from +3.8 for a less than 1 bp yield spread to –4.0 for "*offered only*". This is one of the widest range recorded in our sub-factors[8], but had we stopped at "*bid only*" the range of would have narrowed from 7.8 out of 10 (i.e. from +3.8 to -4.0) to 6.7 out of 10 (i.e. from +3.8 to -2.9). If the range is narrowed from "(*tight - less than 1 bp)*" to "*very wide – more than 5 bp*", the range drops to 6.1 out of 10. If a bond is offered only, the implication is that the dealer will not want to buy it at any price. We doubt that econometric studies seeking to measure bid-offer spreads from trade data recognise the concepts of bid-only and offered-only.

Factors – Results Summary

[8] Public/Private issuance records a range of 8.9/10 which makes this virtually a binary factor.

The overall ordering of factors is tabulated below by order of average score from all respondents. Rankings for sell-side only and buy-side only are given in columns 2 and 3. The number for each factor (e.g. *7* for "*Public offering or private*") relates to the order in which the questions were asked.

Detailed commentary is contained in the sections devoted to each category.

	All	Sell	Buy
7 Public offering or private	1	1	5
13 Liquidity of benchmarks	2	3	6
42 Ability to borrow stock/reverse repo	3	2	14
10 Benchmark issue	4	6	8
24 Availability and transaction costs of derivatives for hedging	5	4	15
39 Central bank repo eligibility (open market operations)	6	7	7
14 Average bid-offer spreads	7	9	3
34 Standardisation of structure and documentation	8	5	16
43 Ability to lend stock/repo	9	8	17
30 Pre-trade price transparency	10	13	2
16 Market maker support (number of declared market makers)	11	10	24
18 Investor diversity	12	11	25
36 Availability of information on underlying (structured/AB products only)	13	19	4
32 Availability of closing dealer quotes for valuation	14	14	18
1 Issue size	15	17	9
12 Issuer benchmarks (size and number)	16	16	19
40 Eligibility for central bank liquidity facility	17	12	34
11 Turnover on recognised platforms or markets	18	18	20
51 Issuer's willingness to reward market making with new issue mandates	19	15	37
3 Credit rating	20	21	10
52 Issuer's sensitivity to secondary market conditions in timing new issues	21	20	28
20 Trading platform (list platforms)	22	22	31
49 Issuer's willingness to buy back	23	23	35
2 Currency of issue	24	27	11
9 Maturity and development of market	25	26	21
17 Sector size	26	28	12
22 Listing (if and where)	27	29	26
33 Availability of and/or dependence on comparable benchmarks	28	25	32
44 Inclusion in repo baskets	29	24	36
4 Time since issuance (or last tap)	30	34	13
37 Availability of public domain valuation models (structured products only)	31	32	29
5 Time to maturity	32	30	33
45 Unhedged cost of carry	33	31	40
25 Deliverability into futures contract	34	33	38
28 Withholding tax on coupons	35	41	1
50 Issuer's willingness to lend stock	36	36	41
35 Complexity and/or idiosyncrasy of structure	37	43	22
41 Eligible collateral for RTGS	38	35	46
21 Inclusion in indices	39	38	42
31 Post trade transparency	40	42	27
48 Firms relationship with issuer	41	40	30
23 Depository	42	44	23
46 Hedged cost of carry	43	37	44
27 Transaction costs	44	39	45
15 Variation from par	45	45	39

26 Codified trading conventions	46	46	43
6 Min denomination	47	47	47

Market Environment

Within market environment the following factors are rated:

A2 **Market environment**	All	Sell	Buy
13 Liquidity of benchmarks	8.1	8.1	8.0
10 Benchmark issue	7.8	7.8	7.5
14 Average bid-offer spreads	7.7	7.5	8.5
16 Market maker support (number of declared market makers)	7.2	7.3	6.5
18 Investor diversity	7.1	7.2	6.5
12 Issuer benchmarks (size and number)	6.8	6.7	7.0
11 Turnover on recognised platforms or markets	6.7	6.6	7.0
9 Maturity and development of market	5.9	5.7	7.0
17 Sector size	5.9	5.6	7.5
15 Variation from par	3.5	3.3	4.5

It is interesting that the liquidity of benchmarks is rated more highly than whether an issue is itself a benchmark. This may simply reflect the fact that most traders are trading against a benchmark issue of some sort, rather than trading the benchmark itself. On the other hand this may reflect the fact that a sectoral benchmark may be less liquid than a non-benchmark with a liquid benchmark against which to trade. An off the run US Treasury is more liquid than an ABS benchmark. There are very few ultimate benchmark issues, such as the US Treasury on the run curve, or the Bund curve. Recent divergence, before as well as after the survey was undertaken, between euro government issues have emphasised the importance of the benchmark status enjoyed by the Bund.

There are interesting differences in the results from the buy-side and sell-side. Most significant is the relative importance given by the buy-side to the maturity and development of the market, and sector size. No doubt these factors are heavily weighted in investment mandates. The sell-side is also the one more likely to be promoting newer markets. Average bid-offer spreads are considered more important by the buy-side than sell-side, but of course are determined by the sell-side. The buy-side will tend to be subject to market bid-offer spreads, particularly in times of relative illiquidity, while sell-side dealers will profit from the size of the bid-offer spread. The sell-side dealers may well be prepared to allocate more risk capital to bonds with a wider bid-offer spread. As already discussed, bid-offer spreads are often seen as a proxy for liquidity though they can also be seen as a function of competition in the market. Post EMU and pre-crisis, the euro-denominated bond market could be characterised as suffering from excess competition as dealers from all the component markets competed with each other in a single market. The bid-offer spread is a reward for market making, which itself is a form of option writing. This relates to our preliminary question on the degree to which relative turnover and volatility describe relative liquidity. Excessively tight bid-offer spreads (i.e. where the spread is tighter than is justified by volatility-or perhaps more precisely auto-covariance) can be considered as a deterrent to liquidity inasmuch as market makers are likely to shift capital to

sectors where liquidity provision is more highly rewarded. The shift of trading capital towards highly structured instruments that occurred in the years running up to the financial crisis may well have been a consequence, not only of excessive competition in the high grade market, but also of a lack of transparency in the structured market. Whatever the regulatory disapproval that it engendered, the Citigroup liquidity arbitrage exercise in August 2004, between cash euro government bonds traded on MTS and Bund futures contracts traded on EUREX, did show up the fragility of the liquidity provided on the MTS system. Many sell-side traders commented that MTS promoted artificial liquidity. This is a consequence of dealers having market making obligations to other dealers and thus parcels of bonds being chased around the market with very low transaction costs. The consequence of this kind of inter-dealer market making obligation on measures of liquidity should be examined further.

There is room for more work on the relationship between Bao et al's γ measure, bid-offer spreads, and volatility on the one hand, and other factors that contribute to liquidity on the other. Future surveys could attempt to explore these relationships.

"*Variation of the price from par*", often considered important for some central banks and for retail investors, scores relatively poorly as a factor (3.5).

	All	Sell	Buy
14 **Average bid-offer spreads**	7.7	7.3	8.7
Tight (1 yield bp or less)	3.8	3.7	4.3
Medium (2 yield bp or less)	2.3	2.2	2.7
Wide(5 yield bp or less)	-0.3	-0.6	0.7
Very wide (more than 5 yield bp)	-2.3	-2.2	-2.3
Bid only	-2.9	-3.1	-2.3
Offer only	-4.0	-4.2	-3.3

As mentioned above the wide range of results for different bid-offer spreads may indicate that this factor is more important than its 7th place in the overall rankings would indicate. It may be of interest that sell-side skew their ratings towards the importance of wide bid-offer spreads while buy-side see more positive virtue in tight bid-offer spreads. The competitive forces leading to tight bid offer spreads may be the explanation. Dealers do not like excessively tight and competitive markets and are also better able to understand the implications of bid only or offered only.

	All	Buy	Sell
18 **Investor diversity**	7.1	7.1	7.0
Central banks	2.6	2.6	2.7
Other AM	2.3	2.3	2.3
Banks	2.3	2.3	2.0
Insurance	2.0	2.1	1.7
Hedge funds	1.3	1.4	1.0
Retail	-1.8	-1.7	-2.0

Interviewees were asked to rate the different classes of investors, assuming that they were the predominant investor in an issue. The range of scores for the different classes of investor is

significant if not very large. The negative score for retail investors reflects the fact that retail investors rarely trade their positions and tend to hold bonds to maturity (this of course may be partially a response to the very large dealing costs that they incur, making trading uneconomic). In addition retail investors rarely lend their stock which can make it extremely difficult for market makers to borrow stock if they go short of an issue in which retail investors predominate. The ability to borrow stock is considered, by sell-side dealers, to be the major factor contributing to liquidity of issues (see: "*A5 Funding*"; "42 *Ability to borrow stock*", below). Note that we did not include average trade size as a factor in relative liquidity. Small relative trade size is an indicator of a retail market which may lead to relative illiquidity for reasons stated above. In addition it is likely to be a consequence of illiquidity rather than a cause. We will nonetheless consider whether to include this as a factor in future surveys.

Central banks are popular contributors to liquidity but this may well be due to the fact that they tend only to invest in liquid issues. The trend by central banks with excess reserves, or more relevantly sovereign wealth funds, to buy less liquid issues is a factor which needs to be covered in future surveys. Again bank liquidity portfolios will focus on more liquid issues. The relative preference for "*Other asset managers*" over "*Insurance companies*" reflects the fact that the latter will tend to be longer term holders. As a result they will invest in less liquid longer dated issues and are less likely to trade their positions (See: "*A1 Issue static data*"; "*5. Time to maturity*"). Hedge funds are often unpopular with sell-side traders when they are viewed as opportunists feeding on the liquidity provision of market makers. They may also be viewed as being as smart, or smarter, than sell-side traders, with many of their traders having graduated from sell-side firms.

	All	Sell	Buy
9 **Maturity and development of market**	5.9	5.8	6.3
<1yr	-3.1	-2.7	-4.0
1-2yrs	-1.9	-1.6	-2.3
2-5yrs	0.0	0.2	-0.3
5-10yrs	1.9	1.8	2.0
>10yrs	3.1	3.0	3.3

While the overall score given to the maturity and development of the market is relatively low the discrepancy between the -3.1 score for markets established less than a year ago, compared to a positive score of 3.1 for markets established more than ten years ago is significant. It should, however be reflected that newer markets are likely to be more complex than older markets. Mortgage markets which are well established, in particular the Danish and US markets, where call optionality is embedded in the issues, or German Pfandbriefe, do indicate that even complex markets can be relatively liquid if they are well established with developed conventions (see: "*A4 Valuation and transparency*").

	All	Sell	Buy
15 **Variation from par**	3.5	3.4	3.7
Close to par (+/- 1/2% p.a. of remaining maturity)	1.8	1.5	2.7
Discount to par	1.0	0.8	1.7
Premium to par	-1.5	-1.6	-1.0

Variation from par seems to have little impact as a factor though there is a notable preference for issues at a discount to issues at a premium.

Issue static data

A1 **Issue static data**	All	Sell	Buy
7 Public offering or private	8.6	8.7	8.0
1 Issue size	6.8	6.6	7.5
3 Credit rating	6.4	6.2	7.5
2 Currency of issue	5.9	5.6	7.5
5 Time to maturity	5.4	5.4	5.5
4 Time since issuance (or last tap)	5.6	5.2	7.5
6 Min denomination	1.4	1.7	0.0

Time to maturity and the length of time since issuance, which are often considered to be critical factors in the liquidity of an issue, ranked a poor 5 and 6 in this category though there is a significant difference between buy-side and sell-side in ranking the importance of time since issuance. One has to suspect that buy-side experience considerable difficulty in obtaining good quotes from the sell-side on older issues though why this factor should rate so low among sell-side is something of a mystery. The greater ability of sell-side traders to hedge and warehouse positions in old issues may have a bearing on the issue.

	All	Sell	Buy
7 **Public offering or private**	8.6	8.8	8.0
Public	4.6	4.6	4.7
Private	-4.3	-4.4	-4.0

While there is no surprise in the results for public vs. private offerings, particularly when it comes to the unanimity of buy and sell-side, the results are useful calibrators of the rest of the survey with public offerings scoring 4.6 out of 5 and private offerings -4.3 out of -5. As we have commented above this makes this factor almost binary in its impact. It should also be noted that many public offering are in effect little more than private placements though the legal format makes them more accessible to a wide range of investors. There is also a wide range of opinions as to what is a public and what is a private offering apart from the strict legal definition based on the Prospectus Directive. A clearer understanding of what traders understand by the words "public offering" and "private offering" in this context would be helpful.

	All	Sell	Buy
1 **Issue size**	6.8	6.6	7.3
EUR 10bn+	2.9	2.6	3.7
EUR 5-9.9 bn	2.1	1.4	3.7
EUR 1-4.9bn	1.6	1.3	2.7
EUR 0.3-0.9bn	-0.9	-1.3	0.0
<EUR 0.3bn	-3.5	-3.6	-3.0

EUR 1 bn marks the cut off for size to be a positive contributor to liquidity. Issues of less than EUR 300 mn are considered highly negatively.

	All	Sell	Buy
3 **Credit rating**	6.4	6.0	7.7
AAA	3.2	3.3	3.0
AA/A	1.4	1.0	2.7
BBB	-0.9	-0.8	-1.3
NIG	-2.8	-2.5	-3.3

The survey was conceived largely as a result of the failure of credit rating agencies to rate liquidity. However it is obvious that credit ratings themselves have an important impact on liquidity-even if not the most important. Ratings below 'A' are considered to be negative contributors to liquidity, particularly if they are NIG (i.e. Not Investment Grade) probably because many institutional investors cannot own NIG rated credits.

	All	Sell	Buy
2 **Currency of issue**	5.9	5.4	7.3
USD	2.4	2.5	2.3
EUR	3.5	3.1	4.3
GBP	0.6	0.6	0.7
JPY	-0.8	0.0	-1.7
CHF	-1.7	-2.0	-1.3
Other developed	-2.0	-2.8	-1.0
Emerging currency	-2.7	-3.7	-1.7

In viewing the currency preferences of respondents it must be emphasised that the survey was carried out in Europe and that therefore EUR-denominated issues are inevitably rated higher in liquidity terms than those in USD. This no doubt also reflects the large number of EUR market makers, and the highly competitive nature of the EUR in the European market place. Liquidity support given by the ECB is also likely to be a major factor. Relatively poor liquidity scores for sterling and poor ratings for all other currencies are significant, particularly inasmuch as these are also European currencies. Biais et al[9] use data provided by ICMA TRAX (now Xtrakter Ltd.), and established that bid-offer spreads in the sterling market were approximately twice those in the euro corporate bond market. The smaller size of the sterling market and the considerably fewer active dealers and major investors are no doubt a major factor in this (see: *"A2 Market environment"*; *"24. Number of declared market makers"* - below).

[9] Biais, Declerk, Dow, Portes, and von Thadden (2006)

4 **Time since issuance (or last tap)**	All 5.6	Sell 5.4	Buy 6.0
<6mths	3.2	2.9	4.0
6-12 mths	1.0	1.0	1.0
1.1-5yrs	-0.4	-0.1	-1.3
5.1-10yrs	-1.3	-1.0	-2.3
>10yrs	-2.5	-1.9	-4.3

At the time that the survey interviews were carried out, traders expressed a strong preference for instruments around the three year maturity range, and both buy and sell-side prefer younger issues: i.e. those most recently issued irrespective of final maturity.

Time since issuance is frequently cited as the largest factor in the liquidity of bonds with trading dropping off sharply six-months after issuance. It is therefore a considerable surprise that this factor is considered relatively low down the scale. Early trading in a bond (during the first six months) may not be considered as true secondary trading as much of it will be interbank or opportunist new issue investors seeking profits or cutting losses. The fact that there is a clear gradient to time since issuance with maturities over one-year being considered as negative is nonetheless important.

5 Time to maturity	All 5.4	Sell 5.2	Buy 6.0
<1yr	0.5	1.0	-1.0
1-5yrs	2.8	2.3	4.3
5.1-10yrs	1.8	1.7	2.0
>10yrs	-0.8	-0.6	-1.3

It is notable that buy-side have a marked aversion to instruments under one year and over 10 years. This may be because of the nature of their mandates and the fact that bonds drop out of fixed income indices when their remaining life falls below one year. Factors relating to the financial market turbulence at the time will also have strongly influenced responses, notably the withdrawal by many investment institutions from the asset backed commercial paper market where risk perception had increased dramatically.

Valuation and transparency

A4 **Valuation and transparency**	All	Sell	Buy
34 Standardisation of structure and documentation	7.7	7.9	7.0
30 Pre-trade price transparency	7.3	7.0	9.0
36 Availability of information on underlying (structured/AB products only)	7.0	6.4	8.5
32 Availability of closing dealer quotes for valuation	6.9	6.9	7.0
33 Availability of and/or dependence on comparable benchmarks	5.8	5.8	5.5
37 Availability of public domain valuation models (structured products only)	5.5	5.3	6.0
35 Complexity and/or idiosyncrasy of structure	4.7	4.0	7.0
31 Post trade transparency	4.5	4.1	6.5

Sell-side rated "*standardisation of structure and documentation*" highly, while buy-side gave very high scores to "*pre-trade transparency*" and "*availability of information on underlyings for structured or asset-backed product*"[10].

Significant divergences of opinion between buy and sell-side relate to price transparency, both pre- and post-trade though the former was considered significantly more important by both. This is supported by the answers to subsidiary questions which give a marginally positive score for early post-trade transparency rather than later:

	All	Sell	Buy
31 **Post trade transparency**	4.5	4.0	6.0
Real time (10 minutes or less but trade size capped)	0.8	0.4	2.0
End of day	0.7	0.0	2.3
(trade size capped)	0.7	0.0	2.3
End of next day (trade size capped)	-0.1	-0.7	1.3
One month or more delay	-1.9	-2.6	-0.3

It is not surprising, given the response of securities firms to regulatory imposed post-trade transparency, that buy-side seem to rate post-trade transparency more positively than sell-side.

There is at least a possibility that the regulatory policy areas and senior management in the industry take a different view to actual traders of the impact of post-trade transparency. That at least has been the anecdotal experience of one of the authors. It is also worth noting that most of the opposition to post trade transparency comes from the US where such transparency has been imposed by the TRACE system. European traders do not have actual experience of regulatory imposed post-trade transparency, at least in the markets where the survey was conducted. In any event these results cannot be considered as determining the position and further research would be helpful.

One result is unambiguous. Pre-trade transparency which ranks 10 in the list of factors is considerably more important than post-trade transparency which ranks 40. Regulatory focus on post-trade transparency seems unwarranted except perhaps in the retail market.

[10] Many of the questions within this category related to structured products and most of the respondents were not responsible for trading structured products. Future surveys would need to select a panel of structured product traders if results are to have greater validity.

Market Infrastructure

A3 **Market infrastructure**	All	Sell	Buy
24 Availability and transaction costs of derivatives for hedging	7.8	7.9	7.0
20 Trading platform (list platforms)	6.1	6.2	5.5
22 Listing (if and where)	5.8	5.6	6.5
25 Deliverability into futures contract	5.1	5.3	4.5
28 Withholding tax on coupons	5.1	4.1	9.5
21 Inclusion in indices	4.5	4.6	4.0
23 Depository	4.4	3.9	7.0
27 Transaction costs	4.2	4.6	2.5
26 Codified trading conventions	2.3	2.1	3.0

Two differences between buy and sell-side stand out within the section devoted to market infrastructure: "*Withholding tax*" and "*Depository*". These factors are of course more important for long term holders than for liquidity providers. Where withholding tax is levied sell-side dealers will have procedures in place to recover it and will usually actively engage in arbitrage that relies on their ability to obtain a refund of credit against withholding tax. Although the ECB has brought the issue to prominence, depositary risk is one of which investors are only just becoming aware. In the case of investors responding to this questionnaire the focus may be more of an administrative and cost issue. Possibly sell-side traders are more likely to have arrangements in place to hold securities in different depositories and to effect transfers between them. Having said this major custodian firms will provide similar services for investors. Possibly subsidiary questions to analyse the nature of concerns over depositories would be appropriate. There can be significant delays and costs in moving securities from one depository to another.

Disappointing in many ways is the relative lack of importance given to codified trading conventions. It is at least possible that these are taken so much for granted that they are not actively considered. A market with no codified trading conventions is unlikely to be liquid. This points to possible limitations in a questionnaire of this nature. However it is possible that if the question were in the negative - by asking what the impact of no codified trading conventions would be - a different response might have been obtained. More relevantly there is strong anecdotal evidence emerging in today's market that smaller traders, in particular, are realising the importance of trading conventions in turbulent and illiquid markets. Trading conventions are important to liquidity but like any laws they are important in protecting weak from the strong. Ultimately it is in the interest of strong participants to ensure that the small participants feel that they are playing on an at least a reasonably level playing field.

24 **Availability and transaction costs of derivatives for hedging**	All 7.8	Sell 7.9	Buy 7.3
Interest rate futures	2.2	1.7	3.3
OTC IRS	2.0	1.3	3.7
OTC CDS	2.9	2.7	3.7

The availability and cost of derivatives for hedging purposes is one of the key factors in determining the liquidity of instruments. Of the factors considered, credit default swaps (CDS)

are clearly considered most important. The regulatory concern with the clearing of CDS since the start of financial market turbulence perhaps illustrates the importance of CDS for the functioning of a modern financial market. The shifting in the basis between CDS and cash bonds as a result of the rising importance of cash liquidity since as well as before this survey was carried out has resulted in significant losses for a number of traders but we suspect CDS remain a key element in bond market liquidity. The irony of course is that the use of CDS has tended to lead to a fall in cash bond turnover. Industry studies which credit the fall in cash bond turnover on the TRACE post-trade transparency system in the US have been countered by arguments that it is the rise in the use of CDS that has led to a fall in cash bond turnover. Academic studies that look at cash turnover as a surrogate for liquidity will need to take into account the commensurate use of CDS.

Interest rate futures which have been the hedging instrument of choice amongst bond traders for many years remain important but the growing volatility of credit spreads has pushed them into second place. As with codified trading conventions, it may be that if the use of interest rate futures has become so ingrained in trader behaviour that they no longer consciously recognise the degree of its importance. Additionally, futures and OTC IRS are both used as interest rate hedging techniques so it could be argued that their combined score outweighs the use of OTC CDS which have been the main means of credit hedging other than shorting an issuer's or similar issuer's bonds. Sell-side traders will have easier access to, and lower transaction costs for, using OTC interest rate swaps (generally with their own in-house swap desk) than do investors so their higher rating amongst buy-side traders is surprising.

While trading platforms are considered important for both buy and sell-side the content of the questionnaire did not adequately list available platforms for us to make safe conclusions about specific platforms. This is an area of importance to be addressed in future surveys.

	All	Sell	Buy
22 **Listing (if and where)**	5.8	5.3	7.0
Dublin	1.0	1.0	1.0
London	1.7	1.0	2.3
Luxembourg	2.2	1.7	2.7
Other EU	1.0	1.0	1.0
US	0.6	-1.0	1.7

Given the use of listing factors in investment mandates, listing of course ranks more highly for investors than sell-side traders. The clearly expressed preference for a Luxembourg listing both amongst traders and investors should be explored further in follow up surveys. No doubt familiarity is a factor here as with depositories. The negative perception of US listings amongst traders is also a matter to be explored. A number of traders declined to answer the subsidiary questions in this section.

	All	Sell	Buy
23 **Depository**	4.4	3.6	7.0
International (Euroclear/Clearstream)	4.1	3.8	4.7
Domestic (EEA)	-0.7	-1.0	-0.3
US (DTC)	0.3	0.3	0.3
Domestic other	-2.6	-3.3	-1.7
Global	3.4	3.2	3.7

We have already identified the discrepancy between buy and sell-side on the question of depositories. Perhaps even more significant is the large discrepancy between the ICSDs and global structures on the one hand and domestic depositories on the other hand. The difference here is highly significant. It may be tempting to suggest that because the respondents were European traders they are biased in favour of the two ICSDs, Euroclear and Clearstream, who will also act as depositories together with the US based DTC for global issues. The poor rating given to domestic EEA depositories belies this argument. This perhaps should send a clear message to the ECB.

Funding

A5 **Funding**	All	Sell	Buy
42 Ability to borrow stock/reverse repo	8.1	8.3	7.0
39 Central bank repo eligibility (open market operations)	7.8	7.7	8.0
43 Ability to lend stock/repo	7.5	7.6	7.0
40 Eligibility for central bank liquidity facility	6.8	7.2	5.0
44 Inclusion in repo baskets	5.7	5.9	5.0
45 Unhedged cost of carry	5.2	5.4	4.0
41 Eligible collateral for RTGS	4.7	5.2	0.0
46 Hedged cost of carry	4.4	4.8	2.5

It is no surprise that funding is a more important factor for the sell-side than the buy-side. The one exception to this is Central Bank repo eligibility (i.e. in open market operations). It is possible that many investment mandates follow Central Bank eligibility criteria. Certainly regulatory categories, such as eligible liquidity for banks, will follow CB eligibility criteria.

Inclusion is repo baskets should probably be more important though it is possible that traders are not fully cognisant of the technicalities of the repo market which tend to be highly specialised.

	All	Sell	Buy
39 **Central bank repo eligibility (open market operations)**	7.8	7.6	8.3
ECB	3.9	3.9	4.0
BoE	3.6	3.5	3.7
Fed	3.0	3.0	3.0
SNB	1.7	1.3	2.0
Other CB of currency	1.6	1.3	2.0

As would be expected, central bank eligibility comes high on the list of factors. It seems surprising that eligibility for open market operations is higher than eligibility for special liquidity facilities (below) but the former list will tend to be more exclusive than eligibility for special liquidity facilities and its impact more ingrained than the recently introduced special liquidity facilities. The relative importance of the ECB and the Bank of England no doubt reflects the European bias of the survey; - none the less the Fed ranks highly. It should be remembered that the Fed operates, in normal times, mainly through system purchases of Treasury securities. Its open market repo activity is relatively limited in size and in the range of securities accepted.

	All	Sell	Buy
40 **Eligibility for central bank liquidity facility**	6.8	6.9	6.7
ECB	4.0	3.7	5.0
Fed	3.6	3.3	4.0
BoE	3.5	3.3	4.0
SNB	2.5	1.7	5.0
Other CB of currency	2.0	1.3	4.0

The high ranking of the ECB reflects not only the fact that the survey is European based but also the fact that the ECB was the first to introduce special liquidity facilities.

Issuer behaviour

A6 **Issuer behaviour**	All	Sell	Buy
51 Issuer's willingness to reward market making with new issue mandates	6.5	6.9	4.5
52 Issuer's sensitivity to secondary market conditions in timing new issues	6.3	6.4	6.0
49 Issuer's willingness to buy back	6.0	6.2	5.0
50 Issuer's willingness to lend stock	4.8	5.0	4.0
48 Firms relationship with issuer	4.5	4.2	6.0

In the fixed income market, issuers' relationships with investors tend to be at arms' length and intermediated by investment banks. It is therefore not surprising that the sell-side rates issuer behaviour more highly, in general, than does the buy-side. Nonetheless given the stated objective of buy-side firms to encourage market making and encouragement for issuers to reward sell-side market making with new issue mandates it is, if not surprising, then at least discouraging that buy-side firms do not see this as an important factor in liquidity. Sensitivity of issuers to secondary market conditions does, however, rank fairly highly with both buy-side and sell-side traders. Insider trader rules should ensure that both sets of traders are equally ignorant of issuers' discussions with investment banks about prospective new issues and they are both susceptible to issuers launching at a time when traders are holding inventory. Buy-side portfolio managers will be even more sensitive than sell-side traders to a fall in portfolio values as a result of over issuance. The real surprise in this section is that buy-side participants apparently rate their relationship with the issuer more highly than do sell-side. If this is so then it is a lesson to issuers of the importance of investor road shows, which generally are the only issuer contact with buy-side, at least in the fixed income market. It is likely that this reflects the relative importance of the issuer's name and credit to buy-side portfolio managers and less interest in the actual behaviour of the issuers which tend to impact sell-side traders more directly. Investors should have more interest in issuer behaviour, not least because this impacts the willingness of sell-side traders to provide liquidity.

Conclusions

We believe that a survey of this type is at least a useful supplement to econometric studies but also that it should lead to future econometric work. It is hard to say whether it would be possible or desirable to assign liquidity ratings to bonds. We think on balance that a form of

such ratings is inevitable as econometric and survey studies of bond market liquidity expand and more clarity and consensus arises around the three questions:

1. What is liquidity?

2. How do you measure it?

3. What factors affect it?

This survey focuses on the last question and assumes that traders understand and have a common view about what liquidity is, if not precisely how it is measured. Regulators and liquidity managers need to understand liquidity better. Of course liquidity will vary over time, and more importantly different investors will have a different perspective of it. One of the issues which have come into focus since the crisis is the degree to which bank liquidity portfolios held interbank liabilities. In normal times these are very liquid, but during a banking crisis they are the least desirable instrument to hold.

There are two broad areas in which we would like to draw conclusions from this initial pilot study.

A. What conclusions can be drawn from this study itself about the factors that contribute to the liquidity of financial instruments?

B. How can the survey be modified and expanded in order to better determine these factors as well as casting light on questions 1 and 2 above?

A. <u>Conclusions from the study.</u>

a. Public Policy

i. Ability to short issues and availability of CDS for hedging are key independent factors in determining liquidity. Regulators and politicians need to take note of this.

ii. Post-trade transparency, if not a negative factor, is of far less significant as a contributor to liquidity than pre-trade transparency.

iii. Transaction costs rank poorly with both buy-side and sell-side traders. This may reflect trader ignorance but in modern firms traders should see clearly the effect of transaction costs in their bonuses.

b. Traders are conservative. Established benchmark status will often count more than other apparently important factors.

c. Any econometric study of liquidity must distinguish between publicly and privately issued instruments. More clarity on what traders understand by these concepts should be obtained.

d. The top ten factors include three factors each from "*market environment*" and "*funding*", two from "*valuation and transparency*" and one each from "*issue static data*" and "*trading infrastructure*".

e. The low ranking of "*age*" and "*size of issues*" needs to be investigated.

f. Market participant indicate a significant preference for Luxembourg listed instruments and for Euroclear/Clearstream as depositories (as well as global format). Is this simply a result of familiarity?

g. Investor attitudes

i. "*Market maker support (no. of declared market makers)*" ranked 11 overall and "*standardisation of structure and documentation*" ranked 8 overall but are only ranked 24 and 16 respectively by investors. These are both areas which investors should perhaps rate more highly and it will be interesting to see how in subsequent surveys the buy-side ranks these factors. It is probable that the crisis has forced the issues to the attention of investors. On the other hand investors may have decided that declared market makers are not true market makers in a crisis.

ii. Similarly issuer factors such as their "*willingness to reward market making in new issue mandates*" (ranked 37 by investors) and "*sensitivity to secondary market conditions*" (ranked 28 by investors) should rank more highly amongst investors as no doubt should issuers willingness to buy back stock. This latter factor is very much a function of the liquidity position of the issuer.

B. <u>Lessons for future studies</u>

a. The survey needs to take in a much greater number of traders covering adequate samples of the different types of firms and markets listed in the questionnaire (Annex 1). At least 50 traders with a 75-25% split between sell-side and buy-side need to take part.

b. To the extent that they still exist, we should include a reasonable sample of structured product traders and design more specific questions for them.

c. A survey of New York and possibly Asian traders would provide interesting comparisons.

d. More detailed questions about measures and definition of liquidity should be asked. A ranking of different measures would be helpful here. Average trade size is probably more a measure of liquidity than a contributory factor.

e. Care should be taken to vary positive and negative contributors to liquidity in the questionnaire.

f. Clarification of repo market practice should be sought and incorporated in questions.

g. Clarification of concern about depositories should be sought.

The relationship between answers on Categories, Factors and sub-Factors, as greater detail is elicited in the Questionnaire, needs to be investigated.

Less liquid issues require greater sales intensity by sell-side firms. A survey of sales intensity (turnover per salesperson) might be a useful measure of liquidity.

Bibliography

Biais, B., F. Declerck, J. Dow, R. Portes, E.-L. von Thadden – 2006 - European Corporate Bond Markets: transparency, liquidity, efficiency.

Bao, J., J. Pan and J. Wang - 2008 - Liquidity of Corporate Bonds – Draft.

Bessembinder,H., W.F. Maxwell, K.Venkataraman - 2005 - Market Transparency, Liquidity Externalities, and Institutional Trading Costs in Corporate Bonds.

Edwards,A.K., E.H. Harris, and M.S. Piwowar - 2007 - Corporate Bond Market Transaction Costs and Transparency.

Goldstein,M.A., E.S. Hotchkiss, E.R. Sirri – 2006 - Transparency and Liquidity- A Controlled Experiment on Corporate Bonds.

Huang, R., and H. Stoll – 1997 - The components of the bid-ask spread: A general approach, *Review of Financial Studies* 10, 995-1034.

Laganá,M., M. Peřina, I. von Köppen-Mertes and A. Persaud – 2006 - Implications For Liquidity From Innovation And Transparency In The European Corporate Bond Market - ECB Occasional Paper Series No. 50/ August 2006

Mackintosh, I. -1995 - Liquidity ratings for bonds - CSFI

Madhavan, A., M. Richardson, and M. Roomans – 1997 - Why do securities prices change? A transactions level analysis of NYSE-listed stocks, *Review of Financial Studies* 10, 1035-1064.

Schultz, P., 2001, Corporate bond trading costs: A peek behind the curtain, *Journal of Finance* 56, 677-698.

SURVEY OF FACTORS AFFECTING LIQUIDITY IN FIXED INCOME TRADING

The survey is sponsored by the International Capital Markets Association (ICMA) and by the European Federation Financial Analyst Societies (EFFAS)

FIRM AND TRADER DETAILS

Firm code= Trader no.= (to be completed by interviewer)

Firm name (optional): Trader name (optional):

The purpose of this survey is to establish the criteria by which you and your peers judge the liquidity of the financial instruments that you trade. As a provider or user of liquidity you ultimately determine which instruments you are prepared to hold on your books and those in which you are prepared to run short positions.

Completion of the survey should not take longer than 30-45 minutes.

Please indicate the nature of your firm (tick **one** only):

- Investment bank
- Universal bank
- Investment manager*
- Insurance company
- Publicly owned bank
- Other-please specify

* Indicate parent group if >50% of mandates are from parent

Are you (tick **one** only) :

- A market maker ?
- Liquidity manager/trader ?
- Portfolio manager/trader ?
- Repo trader ?

What instruments do you trade ? (tick **all** that are applicable)

- Head trader
- Rates
- Government bonds only
- SSA
- Credit
- Credit high yield
- Emerging market currencies
- Emerging market issuers
- Structured products
- Money markets

MARKET LIQUIDITY

How do you rate overall current market liquidity conditions? Score 10 to 0.

0 No market (dealers won't even answer the phone...)
1 Order basis only for all bonds in the sector
2 Order basis only for many but not all bonds
3 Very difficult trading conditions
4 Quite tough to get size away without an order
5 Normal: standard size trades on standard spread
6 Quite good: extra size or tighter spread possible
7 Liquid: good size for best issues and competitive bid/offers
8 Very liquid: active market and tight bid/offers
9 Extremely liquid: very active market, large size and tight bid/offer for most issues
10 Hyper liquid: almost anything trades in size with very tight bid/offers

How do you feel market liquidity conditions will change in the short term (over next 3-months)? Please tick relevant box.

Improve
Deteriorate
No change

To what extent do you consider that relative turnover and volatility are an adequate description of the relative liquidity of a bond? Please tick relevant box.

<50%
50%-75%
>75%

SECTION A

Please score each of the major factors in section A from 10 (very important impact on liquidity) to 0 (no impact on liquidity).
The score from 0 to 10 should reflect **your evaluation of the absolute importance of that factor's effect on the liquidity** of the instruments you trade.

Subsidiary factors should be scored +5 (a very significant contributor to liquidity) to -5 (a very significant negative impact on liquidity).
The score from -5 to +5 should reflect **your evaluation the relative importance of the subsidiary factor within that main factor**.
Most of the subsidiary factors will be positive or neutral but they can be negative.

Section B will ask you to weight the major groups (e.g. A1 Issue static data, A2 Market Environment etc.)

Complete only yellow boxes with Scores or Weights and grey boxes where "Other" options are applicable.

REMEMBER YOU ARE ASKED TO SCORE EACH FACTOR AS A LIQUIDITY CONTRIBUTOR.

A1 Issue static data

1 Issue size

	Score 10 to 0	Score +5 to -5
EUR 10bn+		
EUR 5-9.9 bn		
EUR 1-4.9bn		
EUR 0.3-0.9bn		
<EUR 0.3bn		

2 Currency of issue

Score 10 to 0

Score +5 to -5

USD
EUR
GBP
JPY
CHF
Other developed
Emerging currency

3 Credit rating

Score 10 to 0

Score +5 to -5

AAA
AA/A
BBB
NIG

4 Time since issuance (or last tap)

Score 10 to 0

Score +5 to -5

<6mths
6-12 mths
1.1-5yrs
5.1-10yrs
>10yrs

5 Time to maturity

Score 10 to 0

Score +5 to -5

<1yr
1-5yrs
5.1-10yrs
>10yrs

6 Min denomination

(e.g. EUR 1,000 or EUR 50,000 or equivalent)

Score 10 to 0

Score +5 to -5

1
1,000
50,000+1
50,000
1,000,000

7 Public offering or private

Score 10 to 0

Score +5 to -5

Public
Private

8 Other issue static data (please state and score)

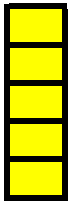
Score 10 to 0

A2 Market environment

9 Maturity and development of market

Score 10 to 0

Score +5 to -5



<1yr
1-2yrs
2-5yrs
5-10yrs
>10yrs

10 Benchmark issue

Score 10 to 0

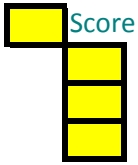
11 Turnover on recognised platforms or markets

Score 10 to 0

12 Issuer benchmarks (size and number)

Score 10 to 0

Score +5 to -5

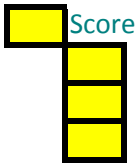


Score +5 to -5

In currency

1
2 to 5
>5

Score +5 to -5



In other currency

1
2 to 5
>5

13 Liquidity of benchmarks

Score 10 to 0

14 Average bid/offer spreads

Score 10 to 0

Score +5 to -5

Tight (1 yield bp or less)
Medium (2 yield bp or less)
Wide(5 yield bp or less)
Very wide (more than 5 yield bp)
Bid only
Offer only

15 Variation from par

Score 10 to 0

Score +5 to -5

Close to par (+/- 1/2% p.a. of remaining maturity)
Discount to par
Premium to par

16 Market maker support (number of declared market makers)

Score 10 to 0

17 Sector size

Score 10 to 0

Score 10 to 0

In currency
In other currencies

18 Investor diversity

Score 10 to 0

Score +5 to -5

Retail
Banks
Central banks
Insurance
Other AM
Hedge funds

19 Other (Please State and Score)

Score 10 to 0

A3 Market infrastructure

20 Trading platform (list platforms)

Score 10 to 0

Score +5 to -5

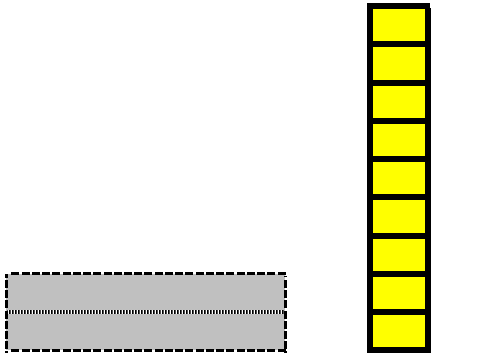
Brokertec
Euro MTS
Local MTS
Tradeweb
Others (please state)

21 Inclusion in indices

Score 10 to 0

Score +5 to -5

Barclays
iBoxx
JPMorgan
Lehman
Merrill
MSCI
ABX (structured/AB credit only)
Other (please state)

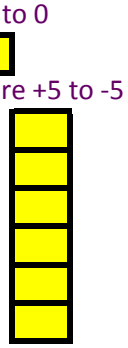


22 Listing (if and where)

Score 10 to 0

Score +5 to -5

Dublin
London
Luxembourg
Other EU
US
Other

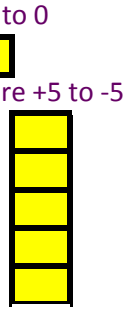


23 Depository

Score 10 to 0

Score +5 to -5

International (Euroclear/Clearstream)
Domestic (EEA)
US (DTC)
Domestic other
Global



24 Availability and transaction costs of derivatives for hedging

Score 10 to 0

Score +5 to -5

Interest rate futures

OTC IRS

OTC CDS

25 Deliverability into futures contract

Score 10 to 0

26 Codified trading conventions

Score 10 to 0

27 Transaction costs

Score 10 to 0

28 Withholding tax on coupons

Score 10 to 0

29 Other infrastructure (please state and score)

Score 10 to 0

A4 Valuation and transparency

30 Pre-trade price transparency — Score 10 to 0

31 Post trade transparency — Score 10 to 0

Real time (10 minutes or less but trade size capped) — Score +5 to -5
End of day (trade size capped)
End of next day (trade size capped)
One month or more delay

32 Availability of closing dealer quotes for valuation — Score 10 to 0

33 Availability of and/or dependence on comparable benchmarks — Score 10 to 0

34 Standardisation of structure and documentation — Score 10 to 0

35 Complexity and/or idiosyncrasy of structure — Score 10 to 0

36 Availability of information on underlying (structured/AB products only) — Score 10 to 0

37 Availability of public domain valuation models (structured products only) — Score 10 to 0

38 Other valuation and transparency (please state and rate) — Score 10 to 0

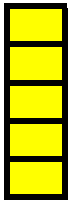
A5 Funding

39 Central bank repo eligibility (open market operations)

Score 10 to 0

Score +5 to -5

ECB
Fed
BoE
SNB
Other CB of currency

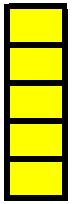


40 Eligibility for central bank liquidity facility

Score 10 to 0

Score +5 to -5

ECB
Fed
BoE
SNB
Other CB of currency

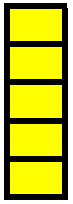


41 Eligible collateral for RTGS

Score 10 to 0

Score +5 to -5

ECB
Fed
BoE
SNB
Other CB of currency



42 Ability to borrow stock/reverse repo

Score 10 to 0

43 Ability to lend stock/repo

Score 10 to 0

44 Inclusion in repo baskets

Score 10 to 0

45 Unhedged cost of carry

Score 10 to 0

Score +5 to -5

Positive
Negative

46 Hedged cost of carry

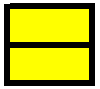
Score 10 to 0

Score +5 to -5

Positive
Negative

47 Other Funding Factor (please state and rate)

Score 10 to 0



A6 Issuer behaviour

48 Firms relationship with issuer — Score 10 to 0

49 Issuer's willingness to buy back — Score 10 to 0

50 Issuer's willingness to lend stock — Score 10 to 0

51 Issuer's willingness to reward market making with new issue mandates — Score 10 to 0

52 Issuer's sensitivity to secondary market conditions in timing new issues — Score 10 to 0

53 Other Issuer Behaviour Factor (please state and rate) — Score 10 to 0

END OF SECTION A: PLEASE CONTINUE WITH SECTION B

Section B

Please now weight the factors BY GROUP . The factors within groups have been repeated ONLY as a reminder of what is in each group and DO NOT NEED WEIGHTING, so please complete yellow boxes only. It is not mandatory that the weightings sum to 100%: a percentage weighting is calculated automatically.

	WEIGHT =>	%		
B1 Issue static data				
1 Issue size	2 Currency of issue		3 Credit rating	4 Time since issuance/tap
5 Time to maturity	6 Min denomination		7 Public or private	8 Other
B2 Market environment				
9 Maturity of market	10 Benchmark issue		11 Platforms/markets turnover	12 Issuer benchmarks
13 Benchmarks liquidity	14 Average bid/offer spreads		15 Variation from par	16 Market maker support
17 Sector size	18 Investor diversity		19 Other	
B3 Market Infrastructure				
20 Trading platform	21 Inclusion in indices		22 Listing	23 Depository
24 Derivatives for hedging	25 Futures contract deliverability		26 Codified trading conventions	27 Transaction costs
28 Withholding tax on coupons	29 Other			
B4 Valuation and transparency				
30 Pre-trade price transparency	31 Post trade transparency		32 Closing dealer quotes	33 Comparable benchmarks
34 Standardisation of structure	35 Structure Complexity		36 Information on underlying	37 Public domain valuation models
38 Other				
B5 Funding				
39 CB repo eligibility	40 Central bank haircut		41 Other repo eligibility/haircut	42 Ability to borrow stock/reverse repo
43 Ability to lend stock/repo	44 Inclusion in repo baskets		45 Unhedged cost of carry	46 Hedged cost of carry
47 Other				
B6 Issuer behaviour				
48 Relationship with issuer	49 Issuer willing to buy back		50 Issuer willing to lend stock	51 Issuer rewards market making
52 Sensitivity to market in new issues			53 Other	

Do you want to change your weightings?

Total all groups