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UNITED KINGDOM DEBT MANAGEMENT OFFICE

THE SECONDARY MARKET FOR GILTS A CONSULTATION PAPER

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INTRODUCTION	3
THE ISSUE	3
THE DMO'S OBJECTIVES IN THE GILT MARKET.....	6
AN ORDER BOOK.....	8
THE PRIMARY MARKET.....	8
THE SECONDARY MARKET	9
Option 1: Continuation of the existing system.....	10
Option 2: Centralised quotation system.....	11
Option 3: Centralised inter-dealer market with quote obligations	12
Option 4: Full electronic dealership market	13
PERIODIC CALL AUCTIONS	13
CENTRAL COUNTERPARTY.....	14
OPTIONS FOR THE RETAIL MARKET.....	15
FURTHER INFORMATION.....	16
ANNEX A: THE GILT MARKET - A BRIEF OVERVIEW.....	17
CHARTS	19
ANNEX B: SOME INTERNATIONAL MODELS	22
ANNEX C: GILT MARKET PARTICIPANTS INVOLVED IN FIXED INCOME TRADING SYSTEMS.....	24
ANNEX D: THE ACADEMIC LITERATURE – A BRIEF REVIEW	26

INTRODUCTION

Fixed income markets, including the gilt market, have traditionally operated as telephone dealership markets. However, a number of new electronic trading systems are being introduced into these markets and are likely to become a feature of the gilt market in the near future. These new systems will probably change the trading environment in these markets significantly. The DMO recognises that the full impact of these changes is not yet clear. However, some of the possible outcomes, particularly the possibility of significant fragmentation of the gilt market, may undermine the DMO's key strategic objective of maintaining a liquid, efficient and orderly gilt market and might, therefore, require a response from the DMO.

This paper seeks market participants' views on whether the DMOs' interaction with the gilt market, in particular its relationship with the gilt-edged market makers, remains appropriate in the light of these developments. The paper briefly outlines a number of possible ways in which this relationship might change. Recipients are invited to comment on these possible approaches, and the implications arising.

Please send any comments to Allison Holland, UK Debt Management Office, Cheapside House, 138 Cheapside, London EC2V 6BB or email them to allison.holland@dmo.gov.uk. The consultation period closes 3 March 2000. Please indicate in your response the capacity in which you participate in the market.

THE ISSUE

1 The use of electronic trading mechanisms has become widespread in equities markets. This has allowed market participants to adopt new trading strategies such as posting limit orders¹ or crossing trades.² In addition, remote participation in securities markets has grown as technology has spread. A number of such systems are being introduced into fixed income markets allowing the electronic display of trading opportunities, automatic matching of trades and automatic trade execution.³

¹ A limit order is an indication to buy (or sell) a security at a price of at most (at least) the specified price.

² Crossing of trades requires interested parties to submit the amounts they want to buy and sell. These are then cleared at an agreed reference price (usually taken from an exchange). Trades are crossed either bilaterally or through a service provider.

³ A recent survey by the Bond Market Association identified 39 systems offering electronic trading services in US fixed income markets. Some of these systems also allow euro sovereign debt to be traded.

These systems can be broadly classified as electronic exchanges, electronic brokers and electronic dealer services.

2 In the first category, the International Securities Markets Association's (ISMA) subsidiary COREDEAL Ltd. has applied to the Financial Services Authority (FSA) for recognition as an investment exchange (RIE) under the Financial Services Act.⁴ If recognised, COREDEAL will allow ISMA reporting dealers to trade eurobonds anonymously through an electronic central limit order book, with trades guaranteed by a central counterparty.

3 In the second category, King & Shaxson's GiltKING system allows the electronic broking of gilt repo. Again on the broking side, Instinet and Cantor Fitzgerald, the latter through its eSpeed platform, are introducing electronic broking of euro-denominated government securities. These brokers not only disseminate trading information electronically but also allow traders the opportunity to execute trades automatically if they wish. BrokerTec, a broker owned by twelve major fixed income players,⁵ is also planning to launch an electronic brokerage service in 2000.

4 Another broker, EuroMTS, has made significant inroads into trading in government bonds in the eurozone countries. Currently, French, German, Italian, Spanish, Belgian, Dutch, Portuguese and Austrian benchmark government bonds trade on EuroMTS. German, Italian and French repo also trade on the system. MTS SpA⁶ has established partnerships with sovereign debt issuers in a number of countries including France and the Netherlands to establish an electronic market in line with the EuroMTS model (which is itself based on the Italian model, see Annex B).

5 Amongst the dealing community, a number of the gilt-edged market makers (GEMMs) are already providing or are planning to distribute prices in European government bonds, firm up to a specified size, to their clients electronically. Some of these new systems will deliver their product across the Internet, exploiting new technology. Others will rely on more established service providers, for example

⁴ To be recognised COREDEAL will have to meet certain standards, including standards relating to the conduct of business on its markets, set down in Schedule 4 to the Financial Services Act.

⁵ See Annex C for the full list of participating dealers.

⁶ MTS SpA provides the market for Italian government bonds and is a shareholder in euroMTS.

Bloomberg, for delivery of their product (see Annex C). In general, these systems will allow the automatic execution of trades.

6 Electronic trading systems are likely to become a significant feature of the gilt market in the near future. The development of these new trading venues may change the balance of risks faced by the GEMMs. The market may fragment, with different trading venues available to different market participants, splitting liquidity in the market. Fragmentation of the market can also lead to pricing inefficiencies, again increasing the risks associated with investing in gilts, and undermining the UK Debt Management Office's (DMO's) strategic objective of maintaining an orderly, efficient and liquid market. Both these eventualities could lead to the cost of liquidity provision increasing, with a possible reduction in these services. Any resulting increase in investors' risk would in turn increase the cost of the Government's financing.

7 Although the full impact of the introduction of these trading systems is unclear, the market environment is likely to change considerably. There are a number of principles, outlined in the next section, to which the DMO attaches importance and the maintenance of which might require the DMO to respond to the arrival of these new systems. Therefore, the DMO is reviewing the implications of these developments for the way in which it interacts with the market. One aspect of this is whether the balance of benefits and obligations of GEMMs, which were put in place when the current dealership structure was implemented in 1986, still remains appropriate.

8 The suggestions outlined below do not preclude the independent development of trading systems. The DMO has an open mind on the systems currently available in the market and does not wish to inhibit the introduction of new trading initiatives.

9 For reasons outlined below, the DMO does not intend to change significantly its approach in the primary market so the paper concentrates on its relationship with the secondary market. The DMO believes that, given the trading characteristics of the market (described in Annex A), liquidity provision in the secondary market is desirable and that some form of dealership system should remain to ensure liquidity. This paper briefly outlines some of the possible ways in which the DMO's relationship with the market could evolve. These are not exhaustive but are intended to illustrate

the issues arising and to focus the discussion. The specific details of any new relationship would be determined through discussion with the market at a later stage.

10 The paper also offers some background on the gilt market (Annex A) and briefly reviews some of the international models (Annex B). Annex C details some of GEMMs and brokers involvement in electronic trading initiatives in fixed income markets and Annex D reviews the academic literature on market structure.

THE DMO'S OBJECTIVES IN THE GILT MARKET

11 The DMO was established as an executive agency of HM Treasury on 1 April 1998. Its key objective is to support the Government's aim of minimising its financing costs taking account of risk. On this date, the DMO took responsibility for all the Government's operational decisions in the gilt-edged market, as well as for the issuance of gilts.

12 One of the DMO's strategic objectives is to "conduct its market operations, liaising as necessary with regulatory and other bodies, with a view to maintaining orderly and efficient markets and promoting a liquid market for gilts".⁷ A liquid gilt market should minimise the Government's cost of raising funds by reducing some of the risks investors face, consequently reducing any risk premium that exists on gilts. Due to the trading characteristics of the secondary gilt market (see Annex A), where the majority of investors may not be actively trading every day, there is unlikely to be an even flow of demand and supply of gilts. Therefore, in common with many other government bond markets, the DMO maintains a system of committed liquidity providers, the GEMMs. The GEMMs bridge the gap between demand and supply, providing comfort to investors that their positions can be liquidated quickly if needs be. Encouraging more overseas participation may generate additional liquidity in the market, and the DMO would be pleased to see new participants enter the market. However, the DMO is keen that the traditional investor base continues to have confidence in their ability to access liquidity.

13 In return for providing this service, the GEMMs have exclusive access to telephone bidding at the DMO's auctions. Competitive bids from investors are

⁷ The DMO's strategic objectives are set out in its Framework Document as revised in October 1999.

channelled through the GEMMs⁸ and they also have access to a non-competitive facility,⁹ which allows them to mitigate some of the risks they face in auctions.¹⁰ The DMO also carries out a range of other secondary market operations exclusively through the GEMMs.¹¹

14 The general principles which will guide the DMO in its approach to the creation of new trading venues are as follows:

- i) Liquidity and efficiency of the gilt market: The DMO would be concerned if the market became excessively fragmented, particularly if it led to significant price distortions between trading venues or if liquidity was damaged significantly. In such an eventuality, the DMO would be keen to see measures adopted to address the negative impacts of such fragmentation.
- ii) Orderly market environment: The DMO, in common with other market authorities, such as the FSA, wants gilts to be traded in an orderly and regulated environment, ensuring at least some minimum degree of investor protection.
- iii) Entry/exit of GEMMs: The DMO's ability to confer or to revoke the primary dealer status of any institution should not be constrained by any external influences. More generally, the DMO believes that barriers to entry and exit for GEMMs should be as low as possible.¹²
- iv) Interests of retail investors: The manner in which these new trading venues would affect retail investors' ability to secure best execution and meet their need for transparency are issues which also need to be addressed.

15 If the DMO were to endorse any one of these new trading systems then that choice would have to be defensible to outside scrutiny.¹³ The DMO is also conscious that any new structure should not necessarily tie itself too firmly to any one technical platform as technology is constantly evolving and improving.

⁸ In auctions of conventional stock, investors can submit their own paper competitive bids.

⁹ Personal investors also have access to a non-competitive bidding facility.

¹⁰ For example, GEMMs may have acquired a short position in the when-issued market, which they need to cover.

¹¹ See "Official Operations in the Gilt-Edged Market: Operational Notice of the UK Debt Management Office", September 1999, for full details of these operations.

¹² Given some minimum levels of operational and managerial competence.

¹³ The competition authorities may have an interest in any new trading structure adopted in the market.

16 The impact of the creation of these new trading venues in the gilt market may require the DMO to take some action in order to uphold the above principles.

AN ORDER BOOK

17 One possibility not considered in this paper is the provision of a DMO-endorsed order book for gilts. Under a full order book, all market participants would be free to indicate centrally their wish to trade through the posting of limit orders. Other market participants would then be free to trade on these limit orders. However, pure order books (where there is no liquidity support) only work well when the security is actively traded and in the DMO's opinion would not be appropriate for the gilt market. Gilts trade relatively infrequently compared with, for example, the FTSE-100 stocks (see Annex A and Chart 4). This means that, if a limit order is posted, the probability of a matching order arriving within a short space of time is quite low, increasing the execution risk¹⁴ associated with posting the order. This is the key benefit of dedicated liquidity providers; they bridge the gap between order arrivals, removing execution risk from the system.

THE PRIMARY MARKET

18 The Government adopts a transparent approach to primary issuance, publishing well in advance details of forthcoming auctions, with the stock to be auctioned announced before the beginning of the relevant quarter and the size confirmed a week in advance. This exposes the Government to a high degree of execution risk¹⁵ as, once details of the auction have been announced, the DMO cannot adjust the timing, stock or size to suit market conditions. The DMO believes it can limit this risk somewhat by having a limited number of counterparties with some obligations to participate in its primary issuance.¹⁶ This also simplifies some of the operational issues (including the processing of bids and ensuring the creditworthiness of DMO counterparties).

¹⁴ Execution risk is the risk of not being able to execute a trade within a desired timeframe.

¹⁵ In this context, execution risk represents the risk of an uncovered auction, i.e. a circumstance where there is insufficient demand for the Government's issuance.

¹⁶ GEMMs are expected to participate actively in auctions and are expected to bid in line with their share of secondary market trading. In the case of index-linked auctions, there is a 3% minimum allotment set for index-linked GEMMs.

19 The GEMMs are also obliged to provide the DMO with a variety of market data.¹⁷ This enables the DMO to monitor the market effectively and is very valuable in informing decisions on what market operations the DMO should undertake. The GEMMs also act as an efficient distribution mechanism, facilitating the transfer of stock from the DMO to end-investors.

20 Overall, the DMO believes that it is advantageous to maintain a list of designated primary dealers to facilitate primary issuance and does not intend to change the structure of the primary market (although electronic bidding at gilt auctions could be introduced in the future). Therefore the focus for possible change is the DMO's interaction with the secondary market.

THE SECONDARY MARKET

21 Currently GEMMs have an obligation to make a two-way price on demand in either all conventional gilts and/or all index-linked gilts (excluding 'rump' stocks).^{18,19} Does this obligation become too onerous as market participants find new venues for advertising and executing transactions? Is it necessary to have such an obligation in place? This paper considers several ways in which the DMO might plausibly change its relationship with the GEMMs.

22 One radical possibility would be to remove all market making obligations in the secondary market from the GEMMs. Under this approach, GEMMs would retain their status as primary dealers by continuing to supply the DMO with market information and participating actively in auctions. Access on a competitive basis to auctions would remain restricted to the primary dealers, although there could be a greater number of these counterparties.²⁰ End-investors would continue to submit their competitive bids through one of these dealers.

¹⁷ For example, daily closing prices, which enables the DMO to produce the GEMMA reference prices.

¹⁸ The DMO's obligations are reinforced by the London Stock Exchange's rules; the two sets of obligations are complementary. Following a recent consultation on the role of inter-dealer brokers (IDBs), the GEMMs are released from this obligation where both parties are participants on the same LSE-registered wholesale dealer broker.

¹⁹ Stocks with less than £400mn nominal in issue are classified as 'rump' stocks. There are currently 24 rump stocks, accounting for less than 1% of the nominal amount of gilts outstanding. The DMO remains committed to provide a bid to a GEMM in any 'rump' stock on request.

²⁰ There may be more demand from financial institutions to acquire primary dealer status if there were no associated market making obligations.

23 This would mirror the situation in the US where the primary dealers have exclusive access to Treasury auctions but are required to report turnover and supply the Federal Reserve Bank of New York (FRBNY) with other market information (see Annex B).²¹ The key advantage of this approach is that it is non-prescriptive and therefore allows the market to find its own equilibrium.

24 However, under this approach, provision of liquidity to the secondary market would be on a voluntary basis; there would be no pool of committed liquidity for investors to access. Given the infrequency of order arrival in the market (see Annex A), this may have a negative impact on investors with a strong need for immediacy and could lead to an increase in any risk premium associated with gilts, with a subsequent increase in the cost of the Government's financing. Consequently, the DMO believes that there is a role for committed liquidity providers in the market. Privileged access to the DMO's primary and secondary market operations, such as the occasional sale or switching of stock through the 'shop window', for these committed liquidity providers, will continue to be the benefit offsetting these obligations. Therefore the DMO does not envisage removing market making obligations from the GEMMs in the secondary market.

Option 1: Continuation of the existing system

25 At the moment GEMMs are obliged to quote a two-way price to investors on demand. This is done through direct bilateral negotiation between client and GEMM, usually over the telephone. As long as direct access to GEMMs remains available to investors then this obligation can be retained. So under this approach, GEMMs would continue to quote a price on demand in all gilts in which they are registered as a market maker. However, they and other market participants would be completely free to participate in any other trading venues, as they liked.

26 The key advantage of this approach is that investors retain a guaranteed source of liquidity, so limiting their liquidation risk. The key disadvantage is that many GEMMs may feel that, in an environment where some market participants initially seek to avoid trading through an intermediary and the GEMMs become the liquidity supplier of last resort, these obligations expose them to too much market risk. This

²¹ The US Treasury market is, however, significantly larger and more liquid than the gilt market.

would reduce their incentives to retain GEMM status and could expose the Government to increased execution risk in its primary issuance.

1. Do respondents believe that the current structure is adequate to cope with the changing environment?

Option 2: Centralised quotation system

27 A related approach would be to require GEMMs to post quotes in all gilts (other than 'rumps')²² on a centralised screen (an electronic bulletin board, for example something similar to the London Stock Exchange's SEAQ system for less-liquid equities). These quotes could be firm up to a certain size²³ either in a set of designated benchmarks or in all gilts. If automatic execution was also a feature of this market, then these quotes could be (pre-trade) anonymous. Currently, GEMMs are not required to make markets to each other, the system could be configured so that GEMMs could not execute against each other.

28 A centralised quote system would be close to the existing system with the added benefit of increasing pre-trade transparency. Some academic studies have found that increasing pre-trade transparency increases trading activity by reducing search costs (see Annex D). Any increase in trading activity, with the additional natural liquidity it would bring to the market, would be welcome.

29 Again, under this approach investors retain a guaranteed source of liquidity, limiting their liquidation risk. However, once again, the incentives for GEMMs change, with the possible exit of some GEMMs, exposing the Government to increased execution risk in its primary issuance.

2. Do respondents believe that requiring GEMMs to post quotes on a central screen would be beneficial to the market? How would it affect transaction costs?

3. If there was a requirement to post quotes centrally, should these quotes be firm in some minimum size? How should this size be determined?

²² Alternatively, the DMO could allow some specialisation in certain sets of gilts, so long as all gilts had a number of competing quotes available to market participants.

²³ The appropriate size would need to be determined by consultation with the market.

- 4. Should the provider of the central screen have any particular characteristics, e.g. should they be a recognised investment exchange?**

Option 3: Centralised inter-GEMM market with quote obligations

30 A different approach would be for the DMO to require GEMMs to post continuous two-way prices to one another in an allocated subset of gilts in minimum size/maximum spread on an endorsed gilt-edged inter-dealer broker (IDB) screen. A set of gilts would be allocated to each GEMM so that all stocks would be covered and that some minimum number of GEMMs would cover each stock.²⁴ Within these parameters, there could be an element of self-selection of stocks by GEMMs. It is envisaged that this market would be characterised by automatic trade execution, therefore it is expected that quotes would be (pre-trade) anonymous. This would provide a central core of guaranteed liquidity to the GEMMs and would support their activity in the secondary market. This is the key advantage. In addition the existence of firm prices should aid the process of price discovery in volatile markets and could result in more efficient price formation at these times.

31 Currently there are three DMO-endorsed IDBs. Compliance could require the GEMMs to maintain a quote on only one of these three screens, which would complicate the monitoring of compliance with the obligation. However, technology could centralise and merge all the information on the IDBs, facilitating the DMO's monitoring of this. This information could be made available to the GEMMs and other market authorities.

- 5. Would this approach improve liquidity in the inter-GEMM market? Would this benefit the market as a whole?**
- 6. Should the obligations hold in all market circumstances? If there are circumstances where these obligations should be relaxed, how should these circumstances be determined?**
- 7. Should the GEMMs be allowed to post their quotes on any one of the endorsed gilt IDBs?**

²⁴ It is envisaged that all gilts would be covered by this requirement. However, it could be implemented only in benchmarks with other arrangements, such as periodic call auctions, for the 'off-the-run' stocks.

Option 4: Full electronic dealership market

32 Under this approach, the DMO would establish a two-tier market, similar to the Italian domestic market for government bonds. Different system providers could support each of the two tiers. The first tier would mirror the inter-GEMM market of option 3. This would then be augmented by an obligation on GEMMs to make a two-way continuous quote (in either all or the same subset of stocks) in minimum size/maximum spread available on a centralised electronic screen to the wider market. Automatic trade execution could be a characteristic of both tiers or could be confined to the inter-GEMM tier, tier 1. This would essentially combine options 2 and 3.

33 Given the committed pool of inter-GEMM liquidity, GEMMs' inventory risk arising out of a trade with the wider market should be much less significant under this system. This should reduce the cost of supplying this liquidity to the market thereby mitigating some of the risk to GEMMs associated with option 2.

- 8. Should there be any limitations on who would have access to the wider market; i.e. tier 2? Would the market favour automatic trade execution in the wider market?**
- 9. How should the operator of each tier of the market be determined? What are the desirable characteristics of such market operators, e.g. should the service be provided by a RIE?**

34 Additionally, the second tier of this market could be augmented by allowing institutional investors to post their own limit orders alongside GEMMs' quotes. However, this might reduce the incentives for the GEMMs to participate and their continued commitment to provide liquidity could not be relied upon.

- 10. Should non-GEMMs have the ability to post bids or offers to trade?**

PERIODIC CALL AUCTIONS

35 All of the above options could be augmented by periodic call auctions, run in parallel. This would allow market participants who do not require immediacy an opportunity to submit their demand and supply schedules to a DMO-endorsed auctioneer. If GEMMs had an obligation to provide firm quotes to a central source, then these could be added to the auction to add liquidity. Alternatively, for more

illiquid stocks, some of the quote obligations on GEMMs could be relaxed and replaced, for example, with an obligation to provide a bid and offer in a daily auction. The frequency of auctions would reflect the trading characteristics of each gilt and could be different for different gilts. Additionally, different market participants might have access to different auction rounds. For example, under option 3, there might be one auction held amongst the participants on tier 1, i.e. the GEMMs, with a second auction following for participants on tier 2. Any unsatisfied bids or offers from the first round could automatically go forward to the second round.

- 11. Would the market welcome such periodic call auctions?**
- 12. Who should act as auctioneer?**
- 13. If GEMMs were obliged to provide firm quotes on a continuous basis, should these bids and offers supplement the auction?**

CENTRAL COUNTERPARTY

36 The issue of whether a central counterparty would be provided for any of the options outlined above is relevant. The DMO recognises that there is a growing trend for trading to be conducted through a central counterparty and that this can bring benefits to market participants. Central counterparties can reduce settlement risk, allow firms to allocate capital more efficiently²⁵ and add to the stability of the market.²⁶ However, given that settlement occurs in an assured payment environment and that the market norm is for T+1 settlement, a gilt central counterparty would seem to add little to the stability of the market. The greatest benefit to market participants, of a central counterparty for outright gilt trades, would be the ability to preserve anonymity in trading. However, the costs associated with the provision of this service would need to be met by market participants. Comments on the value of a central counterparty are welcome at this point. However, details of the service to be offered will depend on how the DMO's relationship with the GEMMs might change and, so, will be dealt with more fully at a later stage.

²⁵ For example by allowing the netting of positions.

²⁶ "Central counterparty clearing houses and financial stability", Bank of England Financial Stability Review, June 1999.

OPTIONS FOR THE RETAIL MARKET

37 It may also be appropriate to consider, at this stage, whether the retail market, personal investors, and the wholesale market, professional investors, should be differentiated. The retail segment is likely to value immediacy over patience, ensuring a continued role for liquidity providers in this market. Additionally, retail investors are likely to value highly the ability to compare competing market makers' quotes, as they are unlikely to have their own independent view of the fair value of each gilt. A transparent secondary market may be more appropriate for this segment of the market.

38 A possible approach would be one where the DMO required specialist retail GEMMs to provide firm quotes in all gilts (excluding 'rumps'²⁷) up to a certain size on a centralised screen. This would help retail brokers to establish 'best execution' for their customers and ensure that this segment of the market continued to have access to a committed source of liquidity.

39 These specialist retail GEMMs could have a different set of benefits associated with this different set of obligations, some of which might depend on the specific structure of the wholesale segment of the market.

40 Such a distinction might lead to fragmentation in the market as a whole. However, trading in retail size is already concentrated amongst a small number of GEMMs and this does not appear to have an adverse affect on price discovery. The DMO believes that price discovery largely takes place in the 'wholesale' segment of the market. GEMMs active in the retail end of the market have access to the IDBs, and there is also some trading between 'wholesale' and 'retail' GEMM businesses, ensuring that the prices they offer to their clients reflect general market sentiment.

41 In order to establish this split, a definition of what a 'retail' trade would be needed. Currently, details of trades executed where the nominal amount is less than £50,000 are published immediately on the London Stock Exchange's Market Information Line (LMIL). This could provide a basis for establishing the cut-off between retail trades and other trades; however, if the market indicated that such a split would be

²⁷ If required, the DMO could provide bids in 'rump' stocks. The DMO will continue to make a bid to GEMMs in all 'rump' stocks on demand.

appropriate, the DMO would expect to determine this through further consultation with GEMMs and brokers active in this segment.

- 14. Do respondents think that there should be a distinct and separate market for retail investors?**
- 15. Should GEMMs who specialise in this sector have different benefits and obligations to those in the professional market?**
- 16. Should other GEMMs be required to make prices to these specialist retail GEMMs?**
- 17. How should the DMO define retail trades? Should there be a maximum size of trade that would qualify as retail?**

FURTHER INFORMATION

42 The attached annexes give some brief background to the gilt market, review existing models in a number of other sovereign debt markets; identify some of the systems with which key gilt market participants are already involved and briefly review some of the academic literature which addresses this subject.

Any additional comments on the issues identified above are also welcome. Please submit any comments to Allison Holland, UK Debt Management Office, Cheapside House, 138 Cheapside, London EC2V 6BB or by email on allison.holland@dmo.gov.uk. The deadline for comments is 3 March, 2000. Please indicate in your response the capacity in which you participate in the gilt market.

ANNEX A: THE GILT MARKET - A BRIEF OVERVIEW²⁸

- 1 As at 31 December 1999, the nominal value of all gilts outstanding was just under £300bn, represented by about 70 different issues. These gilts extend beyond 30 years in remaining maturity, with the average maturity of the gilt portfolio at just under 10 years. The portfolio is split between conventional, fixed coupon gilts (76%) and index-linked gilts (22%) with a small proportion in undated stocks and floating rate notes (see Chart 1). At the end of December 1999, 25% of the portfolio was in long-dated stocks, 26% in medium-dated stocks, 27% in short-dated stocks, 21% in ultra-short stocks with the remaining 1% in undated stocks (see Chart 2).
- 2 At the end of Q3 1999, two-thirds of all gilts in market hands were held by UK insurance and pension funds, principally 'buy and hold' investors who prefer longer-dated maturities (see Chart 3). Just under one fifth of gilts were owned by overseas investors.
- 3 Relative to the UK equity market, the gilt market is characterised by a small number of very large trades. Over the six months ending November 1999, there was on average just over 2,000 trades a day in all gilts (see Chart 4). This compares with an average of approximately 21,000 trades a day on the Stock Exchange Electronic Trading Service (SETS) order book.²⁹ However, the average value of a gilt trade over this period was much greater, in excess of £2mn, relative to the average size of a SETS transaction over the same period, which was just over £62,000. So, the size of the average trade in the gilt market is approximately 30 times that in the equity market. This indicates that trading behaviour in the two markets are significantly different and that structures that work in one market may not work in the other.
- 4 The vast majority of gilt trades involve a GEMM. All the GEMMs are members of the London Stock Exchange, an RIE, and are governed by the rules of the Exchange. As such, the majority of gilt trading is conducted in the regulated environment provided by the LSE.³⁰ The LSE has clear trade reporting and conduct of business

²⁸ See "Gilts: An investor's guide", UK Debt Management Office, September 1999 for further details.

²⁹ SETS is the London Stock Exchange's electronic order book for equities. Currently, only the most liquid equities are traded on SETS. However, the Exchange plans to add less liquid stocks in the near future.

³⁰ Any off-exchange transactions are likely to involve institutions authorised by the Securities and Futures Authority or its overseas equivalent and so are also conducted in a regulated environment.

rules, as well as rules governing any potential default by members. These are intended to give market participants confidence in the orderliness of the market.

5 Currently, the gilt market is a telephone-based market with little price transparency for end-investors. There is some pre-trade transparency provided by some GEMMs who choose to display indicative prices on the wire services but there is no central source of firm prices.³¹ However, the lack of transparency is not so much of an issue for investors in the gilt market as it is in the equity market, where the market is characterised by the existence of significant amounts of private information on the fundamental value of the security. The price of gilts should, in theory, be driven by economic fundamentals on which information is freely available to the public.³² Although some of the approaches discussed would lead to an increase in market transparency, increasing transparency is not the main aim of this exercise. The DMO recognises that revealing the prices at which trades are executed will not necessarily add new information to the market but it would change the risk profile faced by the market makers or liquidity providers and consequently it could increase the transaction costs faced by investors.

³¹ Firm (pre-trade) prices are available to investors by direct application to the GEMMs.

³² However, it is true that some market participants may be more successful than others in interpreting these facts. It is also true that the price can be sensitive to particular demand and supply factors, which some participants may also have more insight into.

CHARTS

Chart 1: Portfolio by stock type (Dec 1999)

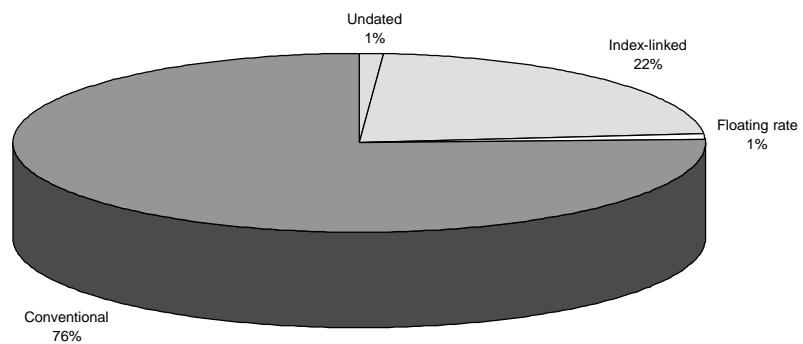


Chart 2: Portfolio by maturity split (Dec 1999)

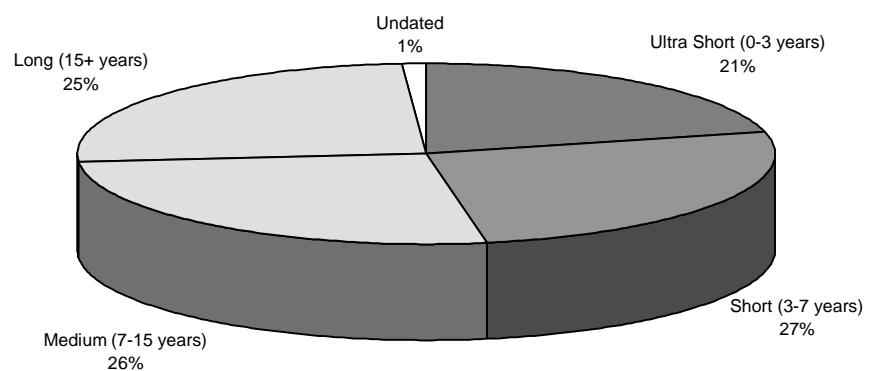
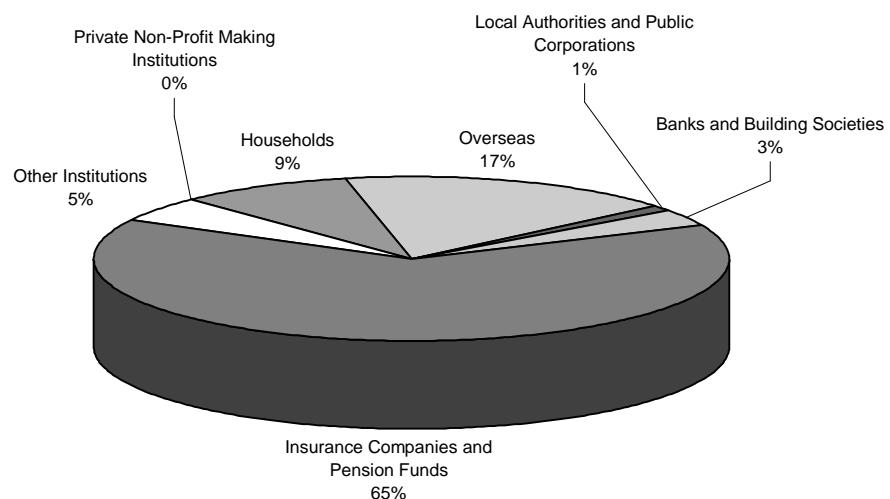
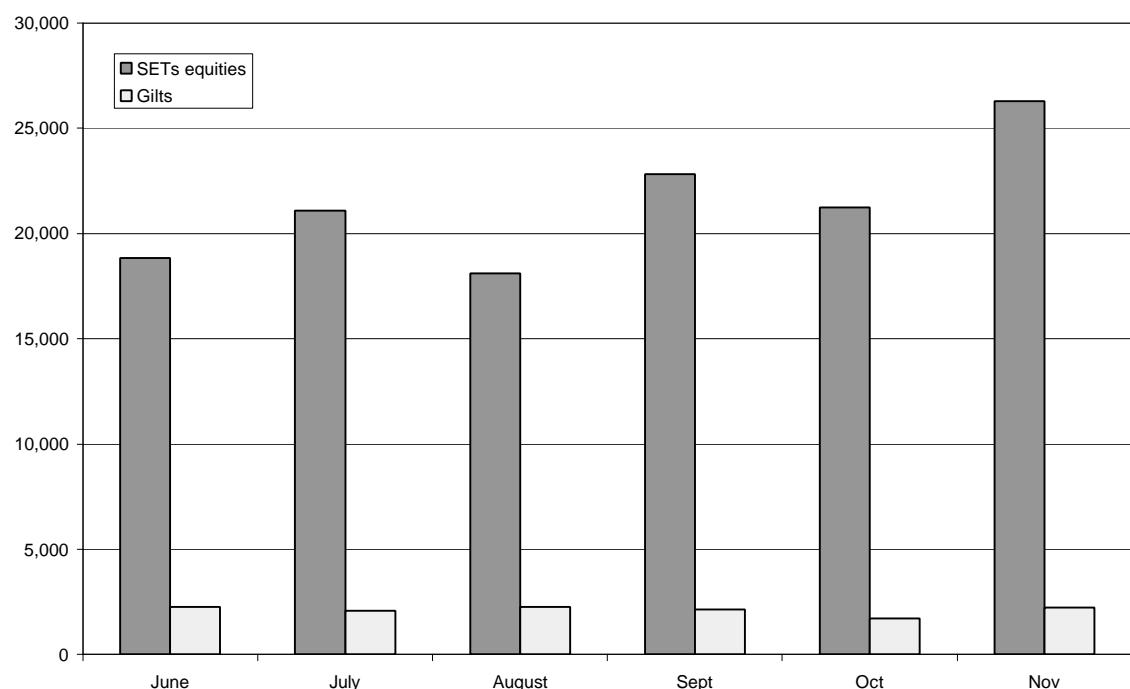


Chart 3: Distribution of gilt holdings (end-Q3 1999)



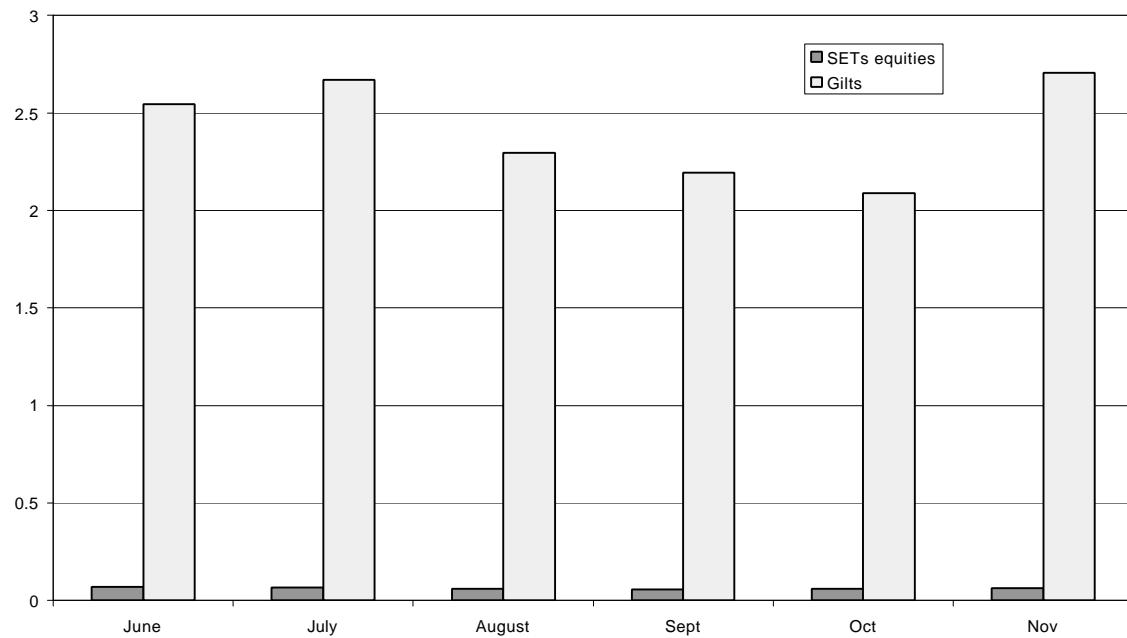
Source: ONS

Chart 4: Average number of bargains (1999)



Source: London Stock Exchange Secondary Market Fact Sheets

Chart 5: Average size of bargain (£mn)^a



Source: London Stock Exchange Secondary Market Fact Sheets

ANNEX B: SOME INTERNATIONAL MODELS

The US model

1 As at May 1999, there were 30 primary dealers in the US. The Federal Reserve Bank of New York (FRBNY) manages the relationship with the primary dealers. Firms retain their primary dealer status as long as they continue to meet certain capital requirements, necessary to support their participation in primary issuance and open market operations, and continue to supply the FRBNY with certain statistical data. Their key requirements are to make reasonably tight spreads to the FRBNY, to participate meaningfully in auctions (relative to their market share) and to provide traders at the FRBNY with market information and analysis. A requirement to maintain a minimum share of customer trading activity (1%) was removed in 1992.

The German model

2 On-exchange trading in German government bonds takes place on the Xetra platform, operated by the Deutsche Börse. Xetra offers a continuous order book, supplemented by periodic call auctions. Liquidity providers (Bertreunds) registered in the stock can be obliged to provide liquidity to the market. The exchange determines whether there will be continuous trading or whether the security will only be traded through a series of auctions. For most bonds a single call auction is conducted at some point during the day. However, the bulk of trading in government bonds takes place in the OTC market.

The Italian model

3 MTS SpA was established by the Banca d'Italia to provide the platform for the Italian government bond market in the late 1980's. It was privatised in 1998. Italian primary dealers are required to post firm quotes, within a maximum spread, up to a certain size in 20% of Italian government bonds. The subset of bonds, minimum size and maximum spread are decided by the Bank, with the allocation of bonds rotated on a monthly basis. There is also a subset of dealers who are required to make prices in larger size, although at wider spreads. Italian financial institutions have access to this market where they can execute against orders placed by dealers. Originally dealers' identity was revealed pre-trade but in 1991 pre-trade anonymity was introduced which led to an increase in liquidity on the system.

4 MTS SpA is now a shareholder in EuroMTS, MTS Amsterdam and MTS France.

The French model

5 French primary dealers (SVTs) are required to provide quotes in benchmarks to a central screen on a continuous basis. They are also required to indicate the size in which these quotes are firm, and to provide a quote in any French government security on demand. In addition to this, they have a turnover target of 3% of primary dealer turnover in BTANs, OATs and OATIs.

6 However, the establishment of MTS France has recently been announced. MTS France will provide an electronic trading platform for French government securities on which the SVTs will have quote-making obligations. This will be based on the Italian model, with MTS SpA taking an equity stake. The SVTs and the Paris Bourse will also have shares in the system. The French Tresor will also be involved in determining the obligations on the market makers, although it will not be taking any equity in the system.

The Dutch model

7 MTS Amsterdam is a joint venture of the Dutch Primary Dealers, the Dutch State Treasury Agency (DSTA) and MTS SpA which began operating a market in Dutch government bonds in September, 1999. All primary dealers are market makers on MTS Amsterdam, entering prices for the bonds that they are obliged to quote. Prices are firm up to a specific amount, indicated by the market maker, depending on the nature of the bond. Transactions are executed automatically on the system. Banks or authorised investment firms, with a total turnover in Dutch government bonds of at least euro 300 million, can be admitted to trading as market dealers (liquidity takers). End-investors are not able to participate. They must still rely on the regular channels through banks.

The Irish model

8 Irish primary dealers are required to provide indicative quotes, continuously and electronically, to the market, in all bonds in which they are registered. In addition, they are required to quote on demand firm two-way prices in a minimum size and maximum spread. The National Treasury Management Agency monitors customer turnover, participation in the professional market (target 10%) and take-up of auctions (target 10%) and taps.

ANNEX C: GILT MARKET PARTICIPANTS INVOLVED IN FIXED INCOME TRADING SYSTEMS³³

Name	GEMMs and brokers involved	Description of system	Securities traded
EuroMTS ^a	ABN Amro, Barclays Capital, Citigroup, CS First Boston, Deutsche Bank AG, Dresdner Bank, Goldman Sachs, JP Morgan, Lehman Brothers, Merrill Lynch, Morgan Stanley Dean Witter, Societe Generale and Warburg Dillon Read	Dealer-owned inter-dealer broker with quote obligations on participating firms.	German, French, Italian, Belgian, Spanish, Dutch, Portugese, Austrian and Pfandbreife benchmark bonds.
BrokerTec Global, LLC ^a	ABN Amro, Barclays Capital, Citigroup, CS First Boston, Deutsche Bank Securities, Dresdner Bank, Goldman Sachs, Lehman Brothers, Merrill Lynch, Morgan Stanley Dean Witter and Warburg Dillon Read. ³⁴	Dealer-owned inter-dealer broker.	Euro-denominated sovereign debt and US Treasuries.
eSpeed ^a	Cantor Fitzgerald	Proprietary broking system available to fixed income dealers and on-line brokers.	G7 government bonds including gilts and US Treasuries.
BondTrader	Morgan Stanley Dean Witter, JP Morgan	Multiple dealer system with prices delivered over Bloomberg.	US Treasuries.
Garban-Intercapital / Bloomberg ^a Intercapital gilt trading	Garban-Intercapital	Bloomberg distributed broking system. Internet dealing system for small size trades.	Gilts and US Treasuries.

³³ This list is not exhaustive and only serves as a brief indication of the current state of play. For a fuller list of trading systems active in the US market see the Bond Market Association's 1999 report.

³⁴ Banco Santander is also a shareholder.

Instinet ^a		Inter-dealer broking system.	All euro-denominated sovereign bonds plus US Treasuries.
GiltWinner ^b	Winterflood Securities Ltd.	Single dealer system available to retail brokers.	Gilts.
Bond eXpress ^b	JPMorgan	Single dealer system available to clients, delivered over Bloomberg and the Internet. Prices will be firm up to euro 25mn.	Euro-denominated sovereign debt.
AutoBahn	Deutsche Bank	Single dealer system available to clients, delivered over Bloomberg.	Gilts and euro-denominated sovereign debt.
WebETrade	Goldman Sachs	Single dealer system accessible by clients over the Internet. It allows automatic execution of trades against firm prices up to a certain maximum size.	Euro-denominated sovereign debt and US Treasuries.

a: these are electronic versions of traditional inter-dealer broker systems.

b: these systems allow users access to quotes provided by a single dealer.

ANNEX D: THE ACADEMIC LITERATURE – A BRIEF REVIEW³⁵

- 1 The market micro-structure literature on the relative merits of dealership markets versus auction agency (order book) markets has primarily focussed on equity markets. There are, however, some fundamental differences between equities and government bonds, principally regarding the information that determines the prices of securities in each of the two markets. In addition, there is generally a large difference in the trade characteristics between these two asset classes, with a greater proportion of small investors active in the equity markets. Therefore, a structure that is appropriate in one market may not necessarily be suited to the other. Nevertheless, this literature does offer some insights into the issues and behaviours that affect the choice of market structure.
- 2 Dattels (1995) provides a useful background to the subject of choice of market structure. He identifies and discusses various issues surrounding the design of market structure for government debt including the incentives of the various official bodies. He identifies the key role of intermediaries as that of providing a bridge between the sporadic and uneven arrival of public orders, offering immediacy at a cost. He characterises a pure dealer market as one where a public order does not have the opportunity to be exposed to another public order, which is the essence of an auction-agency (or order-book) market. Electronic dealer markets tend to be characterised by quotes centralised on a screen-based network; such a system effectively eliminates IDBs. However, he notes that centralised trading with transparent reporting reduces the opportunities for dealers to compete for order flow and may lower the incentives to participate. Additionally dealers in such an environment where automatic trade execution is facilitated are unable to differentiate between trades, which may reduce their appetite for risk, so trade size is likely to get smaller and spreads may widen. In general, in markets characterised by a high proportion of block size trades, a dealer market may be preferred. Block traders can have a high demand for immediacy that is best satisfied by dealers.

³⁵ By Allison Holland.

Theoretical literature

- 3 Pagano and Roell (1996), consider the trading costs associated with dealership markets relative to continuous and transparent auctions. They find that uninformed ‘noise’ traders face lower trading costs on average over all trade sizes in the continuous (and transparent) auction structure relative to the dealership market. However, large traders may benefit from the opaque dealership structure. If the trader is uninformed, he can reveal that to the dealer (minimising the dealer’s need to compensate himself for adverse selection risk). Alternatively, if he is informed, then the dealer can benefit from his information in subsequent trades and may pass some of that benefit back to the trader. However, Pagano and Roell’s analysis does not take account of execution risk so there is no allowance for the impact this might have on traders’ utility functions. They conclude that if policy makers want to reduce the transaction costs of uninformed traders then they should encourage transparency; however, some traders may be worse off, i.e. large traders may gain from the lack of transparency at the expense of uninformed traders.
- 4 Again on the theoretical front, Naik, et al (1999) show that in a dealership market, order flow is informative and dealers will compete for that information by offering preferential prices. This means that in some circumstances the spread declines with the information content of the trade. It is difficult to conceive of circumstances where this would be the case in an auction market. Their model shows that spreads are narrower for uninformed investors when there is full and prompt disclosure because disclosure facilitates more efficient inventory risk sharing. They also show that in an auction (order book) market spreads will be monotonic in order size, i.e. spreads increase as trade size increases. They conclude that no one market structure stands out as one that offers better prices for all types of trade and for all trade sizes. Trades with little information can fare better in a dealership market with full disclosure than in a standard auction market. However, auctions appear to be best where trades contain intermediate amounts of information, while dealership with limited disclosure favours informed trades. They also show that increasing transparency works against the execution of large trades which perhaps explains why many electronic trading systems, including SETS and LIFFE Connect, have special facilities for executing block trades.

5 The model of Forster and George (1992) shows that the degree of anonymity provided by a market will alter the distribution of wealth across agents and the depth of the market. They show that revealing the direction and size of liquidity trades in advance of trading can decrease the expected transaction costs of liquidity motivated traders, providing a motivation for so-called ‘sunshine trading’.

6 Handa, et al (1997) model the investor’s decision to place a market or a limit order in an order driven market where there are some informed investors present. They show that the spread is maximised in this market, where there are no committed liquidity providers, when the proportion of buyers is equivalent to the proportion of sellers. This is in contrast to the position where a risk-averse dealer provides liquidity; in the dealer market, the spread is minimised when there is an equal number of buyers and sellers.

Empirical literature

7 Much of the empirical work on government bond markets focuses on measuring liquidity in the market. Work by the Euro-currency Standing Committee (published by the Bank for International Settlements) on market liquidity identified the market impact of macroeconomic announcements in a range of markets including the UK gilt market, building on the work of Fleming and Remolana (1997). In addition, a number of papers have considered trading costs in European government bond markets including Proudman (1995), for UK gilts, and Scalia and Vacca (1998), for Italian bonds. Others have examined market maker revenues (Hansch and Saporta (1999)) and the information content of inter-dealer trades (Vitale (1998)). However, few have addressed explicitly the choice of structure of the market and considered how it should evolve. Most of the empirical studies that consider the question of competing market structures are based on equity markets.

8 Blennerhassett and Bowman’s (1998) empirical work provides support for the conclusions of Naik, et al (1999). They present evidence that a move from a telephone dealership market to a screen-based order book on the New Zealand stock exchange led to a reduction in trading costs. However, they also found that the spread became more sensitive to trade size that might impose disproportionate costs on large quantity traders.

9 Recent empirical work (such as Naik and Yadav (1999)) on the impact of the change from dealership market to order book in the London equity market has addressed this issue and it appears that investors have benefited from this change in that they now face lower trading costs. However, these benefits are restricted to the most actively traded stocks so that the possible impact of a switch to an order book for less actively traded securities remains uncertain.

10 Madhavan and Sofianos (1998) study the behaviour of specialists on the NYSE. Specialists supplement the public auction process by occasionally acting as dealer. There is one specialist per stock traded on the NYSE; specialists, however, can be registered in several stocks. Specialists are required to buffer temporary shifts in supply or demand, thereby allowing prices to move from one point to another in an orderly fashion, reducing volatility. They also supply liquidity to the market in this fashion. Madhavan and Sofianos establish a number of facts – most of which are unsurprising. First, specialist participation rates are negatively related to trading frequency and capitalisation of the stock, so liquidity provision becomes less important the more frequently securities trade. Specialists' participation is more sensitive to inventory when the stock is small; this means that they perceive their risk to increase with the proportion of stock that they hold. Again a significant proportion of stock in specialists' hands would be indicative of an illiquid security. However, the authors show that their participation does help reduce execution costs and stabilises prices.

11 Much of the empirical literature can be classed as event studies and as such changes directly resulting from an 'event' are difficult to distinguish from other unrelated changes in trading behaviour or trading patterns. Given this, experimental research could provide a clearer insight into the impact of changes in trading environment on trading behaviour.

Experimental literature

12 Bloomfield and O'Hara (1999) conduct a laboratory experiment to examine the impact on trading costs and price efficiency of changing the level of transparency in a multiple dealership market. They examine three settings classified as 'opaque', equivalent to a telephone dealership market where prices are sought by the trader from a number of dealers simultaneously; 'semi-opaque', where firm quotes are

posted centrally for all to observe; and ‘transparent’, where all firm quotes and transaction prices and quantities are observed by all.

13 The authors find that there is little difference between price-efficiency and spreads between the ‘opaque’ and ‘semi-opaque’ settings. However, they find that prices move very quickly to their new equilibrium level in response to new information about the security’s value in the transparent setting, but that this increase in price efficiency is achieved at the cost of increased trading costs.

14 They also find that transparency has a significant impact on traders’ returns. Informed traders’ profits are lower in the transparent setting than in either of the other two settings. However, the difference in profits between the opaque and semi-opaque is not significant. Liquidity traders (who need immediacy) do badly in every market setting. However, their losses are also affected by the degree of transparency in the market; they are significantly larger in the transparent setting. This is in contrast to the findings of Pagano and Roell and Forster and George, who would expect the change in the level of transparency to change the distribution of returns away from informed traders but towards the uninformed, liquidity traders. Bloomfield and O’Hara find that while the informed traders lose as transparency increases, uninformed traders also lose. Consequently, and perhaps counter-intuitively, market makers benefit as transparency increases (although quote disclosure has no discernible effect on market makers’ earnings). The authors attribute this to the fact that transparency reduces the need for market makers to compete for order flow by narrowing spreads, allowing market makers to earn greater returns. This is a significant departure from standard microstructure theory (which would have predicted that their winnings would have been unchanged but that the winnings of informed traders would have been redistributed to uninformed traders).

15 The authors suggest their findings call into question the Securities Exchange Commission’s single-minded view that full price transparency should be the ultimate goal of a market regulator/designer. Transparency will benefit the market if the regulator’s aim is to make markets fully price efficient, but this will not benefit the uninformed investor in terms of the transaction costs he faces. Indeed, if the market is characterised by a large number of liquidity traders who demand immediacy, then opaqueness may be the preferred/optimal setting. The results also lend support for

delays in publishing details of large block trades as this less transparent setting might have value in promoting market liquidity.

16 Flood et al (1999) conduct a similar experiment, although their experiment is conducted in a more dynamic setting. They find that increasing the level of pre-trade transparency, by moving to the ‘semi-opaque’ setting, generates new trading interest so that the volume of trade increases, although there is little significant impact on the trading costs of investors. In contrast to Bloomfield and O’Hara they find that prices actually become less efficient as the trading environment becomes more transparent.

Conclusions

17 So, the academic findings are far from conclusive. There is some evidence that introducing more pre-trade transparency into a market may generate new trading interest due to the reduction in search costs faced by investors. This is unlikely to change investors’ trading costs significantly. However, in an automatic trade execution environment, this greater price transparency should be accompanied by pre-trade anonymity. There is evidence that there is a significant role for liquidity providers in less liquid securities but that introduction of a full order book might bring benefits to investors active in very liquid securities. However, the impact of introduction of an order-book has only been tested to date in equity markets; the different trading characteristics of bonds means that there is not necessarily a straight read across to bonds. The evidence of the impact of increasing post-trade transparency in the market is mixed. Everyone appears agreed that informed traders (who can be thought of as large block or professional wholesale traders in government bond markets as there is no private information in these markets) will be worse off. Standard theories suggest that there would be a redistribution of wealth from these informed traders in favour of uninformed traders; however, the experimental literature casts some doubt on this assumption.

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