



European Government Bond Markets: Transparency, Liquidity, Efficiency

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Road Map

- Transparency and MiFID
- Market microstructure
 - EU and US government bond markets
 - Electronic platforms
 - Issuers and primary dealers
- A model of interaction among issuers, dealers and customers
- Empirical evidence
- What the markets say
- Policy implications



Role of government bond markets

- Managing public debt
- Government bond markets as a 'discipline' on fiscal policy
- Government bond markets and monetary policy (note: transparency might affect liquidity and valuation of repo collateral)
- Fund portfolio management and government bond markets
- Bond market size and liquidity and international role of currency



Features of government bond markets

- Equity markets: asymmetry of information on cash flows
- Bonds: fixed and known cash flows, finite lives, more likely to be held for long run (hence 'off-the-run' government bonds illiquid)
- Size of government issues often very large
- Hence risk positions taken by dealers providing liquidity are often greater than in equity markets



Transparency

- What is it?
 - pre-trade: quotes, limit-order book
 - post-trade: prices, quantities, transactors
- When does it matter?
 - When inventory positions can be worked out, *e.g.*, in a lumpy market with little activity (often true of government bond markets)
 - When order flow is informative and available to a select number of privileged participants, *e.g.*, when dealers have monopoly power or large client bases in which it is possible to internalise order flow



MiFID and transparency

- Regulators favour more transparency
 - level playing field: competition, fairness
 - monitoring best execution: investor protection
- MiFID could require RMs and MTFs to communicate quotes and publish price and volume of transactions – for OTC trades too – under consideration in the Commission now, for decision in 2007



Can there be too much transparency?

- *Transparency can undermine liquidity:*
opacity encourages participation of liquidity providers
- Excessive transparency of B2B market could reduce frequency of requests for quotes, hence reduce information in B2B limit-order book
- Too much B2C information would exacerbate 'winner's curse'



Electronic markets and transparency

- Real-time analysis of information from electronic trading platforms could enable market participants to infer impending trader-type and size, hence whether a trader has an unwanted inventory position (so affecting equilibrium amount of information communicated to market)
- Thus many electronic markets provide less than full transaction information
- Though more opaque, voice communication in repetitive trading (OTC) can develop trust



Undermining liquidity

- Inventory management
- The winner's curse
 - suppose seller puts in RFQ in B2C market
 - highest-bidding dealer secures the bonds
 - successful dealer seeks to hedge position in B2B market
 - underbidders know this and take up contrarian positions
 - the more transparent the B2C market, the more difficult it is for successful bidder to hedge
- But high turnover can provide a 'natural veil' – this is an empirical question



US Experience

- SEC/Treasury were concerned about the issue of transparency and made it known
- Market participants responded with GovPX in 1990
 - Consolidated quote information from different IDBs
 - returned best quotes to participants in real time
- Cantor did not participate



US Experience (cont'd)

- Cantor set-up eSpeed platform
 - Not just transparency but easy electronic trading for participants
 - Only for the benchmarks, because vast amount of activity and therefore natural veil
- ICAP set up BrokerTec in competition – also quite transparent, but hidden component of limit orders
- Other IDBs through GovPX no longer competitive for the benchmarks
 - too little activity and therefore inefficient, but sometimes more negotiable on large quantities
 - For off-the-run Treasuries, GovPX is the venue with sufficient opaqueness



US Experience: Summary

- Transparency was not forced by regulator
- Market has produced transparency where it is most beneficial and least damaging and maintained opaqueness where it is most needed



European government bond markets

- Issuers are monopolistic sellers, but also monopsonistic demanders of liquidity services – distorted market structure
- But competition among issuers (esp. in euro area)
- Issuance procedures: auction/syndicate
- Issuers have relationships with primary dealers (use of MTS electronic platform to monitor dealer activity)
- Futures and interest-rate swaps volumes high relative to cash market – hence less ‘natural veil’ effect in cash market than in US
- Most B2B activity is electronically traded, and MTS platform is transparent, but
 - Mainly effective for the benchmarks – as in US
 - Quote anonymity introduced on MTS late 1990s, hidden limit-order quantity – both were found necessary for efficient market
- Only about 50% of B2C is electronically traded, and Bondvision and TradeWeb (RFQ platforms, B2C) not used for large trades



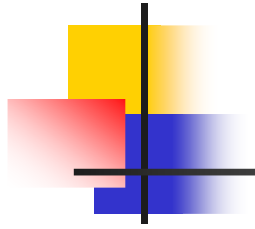
Theory

- With EMU, small issuers unattractive – how do they sell debt?
- Incentives and the auction-syndicate system
- DMOs minimise cost of issuance (maximise returns)
- Dealers maximise returns
- DMO as monopoly issuer extracts rents from end-customers – who benefit from greater liquidity
- Opaque market → higher spread, distributed between dealers and issuer
- Cost borne by end-customers – who benefit from guarantee of liquidity
- Complete transparency eliminates issuer's ability to give incentives to dealers



Evidence from MTS and US Treasury market

- Turnover
- Other measures of liquidity
- Execution quality
- Optimal inventory management/winner's curse
- Natural experiment



Turnover

Countries that rely more on syndicate issuance and placing of secondary market obligations have higher turnover percentages on MTS

(contrast *e.g.* Finland with France and Germany)

Table A1.4 Finland, 31-Dec-04 (€ millions)

		Security ISIN	Outstanding	MTS Volume	Turnover %
RFGB 2.75%	04-Jul-06	FI0001005514	7,110	998.57	14.04
RFGB 5%	04-Jul-07	FI0001005332	6,221	1888.86	30.36
RFGB 3%	May-08	FI0001005522	5,999	-	-
RFGB 5%	25-Apr-09	FI0001004822	5,653	934.05	16.52
RFGB 5.75%	23-Feb-11	FI0001005167	5,673	2097.4	36.97
RFGB 5.375%	4-Jul-13	FI0001005407	6,000	1319.15	21.99
RFGB 4.25%	4-Jul-15	FI0001005704	5,000	1582.31	31.65
Benchmark			41,656	8820.34	21.17
Non-Benchmark			21644	1197.73	15.83
Total			63,300	10018.07	5.53

Note: The note on table 1.2 applies here too.

Table A1.5 France, 15-Jun-04 (€, millions)

			Security ISIN	Outstanding	MTS Volume	Turnover %
BTAN	12/01/06	5.00%	FR0102626779	17,599	259.19	1.47
BTAN	12/07/08	3.00%	FR0105760112	17,336	466.93	2.69
OAT	25/10/13	4.00%	FR0010011130	17,422	379.59	2.18
OAT	25/04/19	4.25%	FR0000189151	11,833	323.66	2.74
OAT	25/10/32	5.75%	FR0000187635	18,738	108.24	0.58
Benchmark				82,928	1537.61	1.85
Non-Benchmark				704,772	17991.66	2.55
Total				787,700	19529.27	2.48

Note: The note on table 1.2 applies here too.

Table A1.9 Italy, 31-Dec-2003 (€, millions)

		Security ISIN	Outstanding	MTS Volume	Turnover %
3-yrBTP:	1-Sep-06	IT0003522254	13,775	5488.75	39.85
3-yrBTP:	15-May-06	IT0003477111	15,100	4074.08	26.98
3-yrBTP:	1-Feb-06	IT0003424485	16,060	4228.43	26.33
5-yrBTP:	15-Sep-08	IT0003532097	7,700	2018.09	26.21
5-yrBTP:	15-Jan-08	IT0003413892	15,970	1759.5	11.02
5-yrBTP:	15-Oct-07	IT0003271019	16,351	1516.07	9.27
10-yrBTP:	1-Aug-13	IT0003472336	18,410	6327.53	34.37
10-yrBTP:	1-Feb-13	IT0003357982	17,943	3832.5	21.36
10-yrBTP:	1-Feb-12	IT0003190912	23,468	2861.78	12.19
15-yearBTP:	1-Feb-19	IT0003493258	13,940	595.28	4.27
15-yearBTP:	1-Aug-17	IT0003242747	14,517	319.79	2.20
30-yearBTP:	1-Aug-34	IT0003535157	7,000	719.52	10.28
30-yearBTP:	1-Feb-33	IT0003256820	15,454	333.13	2.16
30-yearBTP:	1-Nov-29	IT0001278511	22,478	183.26	0.82
Benchmark			218,166	34257.71	15.70
Non-Benchmark			938,934	98,648	10.51
Total			1,157,100	132905.6	11.49

Note: The note on table 1.2 applies here too.



Liquidity

- *Where transparency is high, trade size falls (Italy and US)*
- *Where primary dealer obligations are greatest or where syndicated issuance is used heavily, we see better participation /liquidity provision on MTS and artificially small effective spreads*

Table A2.1 Short Maturity

Panel A - Benchmark Issues															
Country	Effective Spread			Steepness			Trade Size			Best Liquidity			Total Liquidity		
	Median	Q1	Q3	Median	Q1	Q3	Median	Q1	Q3	Median	Q1	Q3	Median	Q1	Q3
AT	1.87	0	1.95	1.94	1.85	1.95	10	10	10	40	20	60	260	120	300
BE	1.83	0	1.9	1.9	1.81	1.92	10	10	10	50	30	70	280	60	290
DE	1.91	0	1.99	1.98		1.98	10	5	10	30	20	65	150	140	140
ES	0	0	1.96	1.96	1.89	1.97	10	10	10	60	30	90	310	60	320
FI	1.87	0	1.99	1.98	1.86	1.99	10	10	10	50	30	80	300	60	310
FR	1.92	0	2.01	1.95	0	2.01	10	5	10	30	20	45	190	60	305
GR	1.88	0	1.98	1.9	1.87	1.91	10	5	10	40	30	60	250	120	275
IT	0	0	1.99	1.99	0.98	1.99	5	5	5	35	20	62.5	280	52.5	330
NL	1.96	0	1.99	0.99	0.98	1	10	10	10	20	20	30	120	90	160
PT	1.89	0	1.98	1.98	1.87	1.98	10	10	10	50	25	75	260	80	260
US-BrokerTec	0.78	0.78	0.78	1.56	1.56	1.56	5	2	10	33	18	59	104	71	150
US-eSpeed	0	0	2	2	1	2	5	2	16	123	62	192	549	371	693
US-GovPX	0.79	0	0.79	N/A	N/A	N/A	5	5	20	30	12	52	N/A	N/A	N/A

MTS data are April and May 2004; BrokerTec July 2004; eSpeed April 2005; GovPX April 2004. Effective spread is measured as twice the difference between transaction price and mid-quote immediately preceding the transaction expressed as percentage of the mid-quote (multiplied by 100 to show it as basis points). Steepness is the average of steepness on each side of the orderbook: the difference between the 3rd worst bid/offer and the best bid/offer, as a percentage of the mid-point between these (multiplied by 100). Trade size is based on nominal volume being traded. Best liquidity is based on average of the quoted size at the best bid and offer (quotes immediately preceding the transactions). Total liquidity is based on average of the total amount offered and the total amount bid in the best three quotes.

Table A2.3 Long Maturity

Panel A - Benchmark Issues																
Country	Effective Spread			Steepness			Trade Size			Best Liquidity			Total Liquidity			
	Median	Q1	Q3	Median	Q1	Q3	Median	Q1	Q3	Median	Q1	Q3	Median	Q1	Q3	
AT	1.85	0	2.05	1.87	1.84	2.06	10	5	10	25	20	40	140	85	150	
BE	1.96	0	2.01	1.99	1.87	2	10	10	10	30	20	45	200	125	250	
DE	1.93	0	3.73	1.97	1.86	1.97	10	5	10	20	15	30	140	40	140	
ES	1.83	0	1.99	1.87	1.81	1.92	10	10	10	30	20	50	215	110	260	
FI	1.8	0	1.83	1.83	1.79	1.83	10	10	10	30	20	40	180	110	210	
FR	2.01	0	3.76	2.02	1.84	2.02	10	5	10	25	20	40	180	40	210	
GR	1.84	0	1.98	1.97	1.84	1.98	5	5	10	30	20	45	170	110	190	
IE	1.95	1.88	5.63	2.82	1.85	2.82	10	10	10	20	15	40	85	70	85	
IT	1.9	0	2	1.99	1.87	2.01	5	5	10	37.5	20	55	260	170	305	
LU	4.2	1.83	6.25	2.09	1.81	2.71	10	10	10	30	20	50	140	100	160	
NL	1.98	0	3.73	1.99	1.86	2.09	10	5	10	20	20	40	150	70	190	
PT	1.98	1.82	3.69	1.87	1.8	1.98	10	10	10	30	20	50	200	60	220	
US-BrokerTec	1.53	1.52	1.54	3.07	3.06	3.1	2	1	4	17	10	29	76	56	103	
US-eSpeed	2.08	2.07	2.08	3.12	3.11	3.13	3	1	8	32	19	54	181	106	265	
US-GovPX	3.23	3.18	6.44	N/A	N/A	N/A	3	1	5	4	2	15	N/A	N/A	N/A	



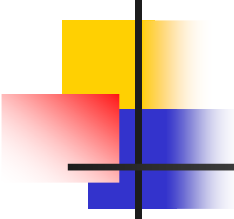
Execution Quality

- *Low execution quality is defined as trades that occur at high effective spreads.*
- *Execution quality is good on MTS for small trades*
- *Large trades are executed in more opaque market segments (even though more expensive)*

Table A3.1 Short Maturity (Benchmarks): Execution Quality Analysis

Country-Platform	Trades	Low Execution Quality & Trade Size in Highest Quartile	Low Execution Quality & Size at Best in Lowest Quartile	Low Execution Quality & Steepness in Highest Quartile
AT	68	16%	9%	15%
BE	264	5%	7%	8%
DE	179	4%	9%	5%
ES	307	11%	9%	8%
FI	179	17%	3%	11%
FR	204	10%	6%	5%
GR	232	2%	8%	11%
IT	2343	10%	3%	12%
NL	100	1%	5%	4%
PT	270	2%	7%	5%
US-BrokerTec	9204	7%	7%	0%
US-eSpeed	860	4%	1%	3%
US-GovPX	805	22%	7%	6%

Notes: Low execution quality is defined as trades that occur at effective spreads that are in their highest quartile by size. Likewise, trade size is considered large if in the highest quartile. Size at best in lowest quartile represents a situation where the average size available at the best bid and ask quotes is relatively low and price impact for a large trade would be expected to be high. The steepness measure is described in the notes to table 2.1. When this is in its highest quartile we regard it as an unfavourable time to be executing large trades.



Optimal Inventory Management and Winner's Curse

- B2C is mainly RFQ – this introduces winner's curse problem
- Seller-initiated trades have been preceded more often by a rise in the ask size than a rise in the bid size
- A rise in bid size is more prevalent before buyer-initiated trades
- The winner's curse problem will worsen over time if the B2B and B2C markets become more transparent and if trading is increasingly centralised on a single platform

Table A4.2 Medium Maturity, Benchmark Issues, Analysis of Winner's Curse

Panel A. Limit-order book activity in advance of seller initiated transactions

Country	Sells	Rise in Bid Size	Rise in Ask Size	Rise in Ask Size & Negative Return	Rise in Ask Size & Positive Return
BE	28	4%	11%	7%	-
DE	28	4%	14%	7%	4%
ES	59	7%	29%	10%	10%
FI	34	6%	3%	3%	-
FR	41	12%	5%	2%	-
GR	118	-	-	-	-
IT	365	10%	23%	10%	6%
NL	6	-	17%	17%	-
PT	11	27%	45%	27%	-
US-BrokerTec	3332	18%	29%	10%	4%
US-eSpeed	493	6%	17%	7%	-

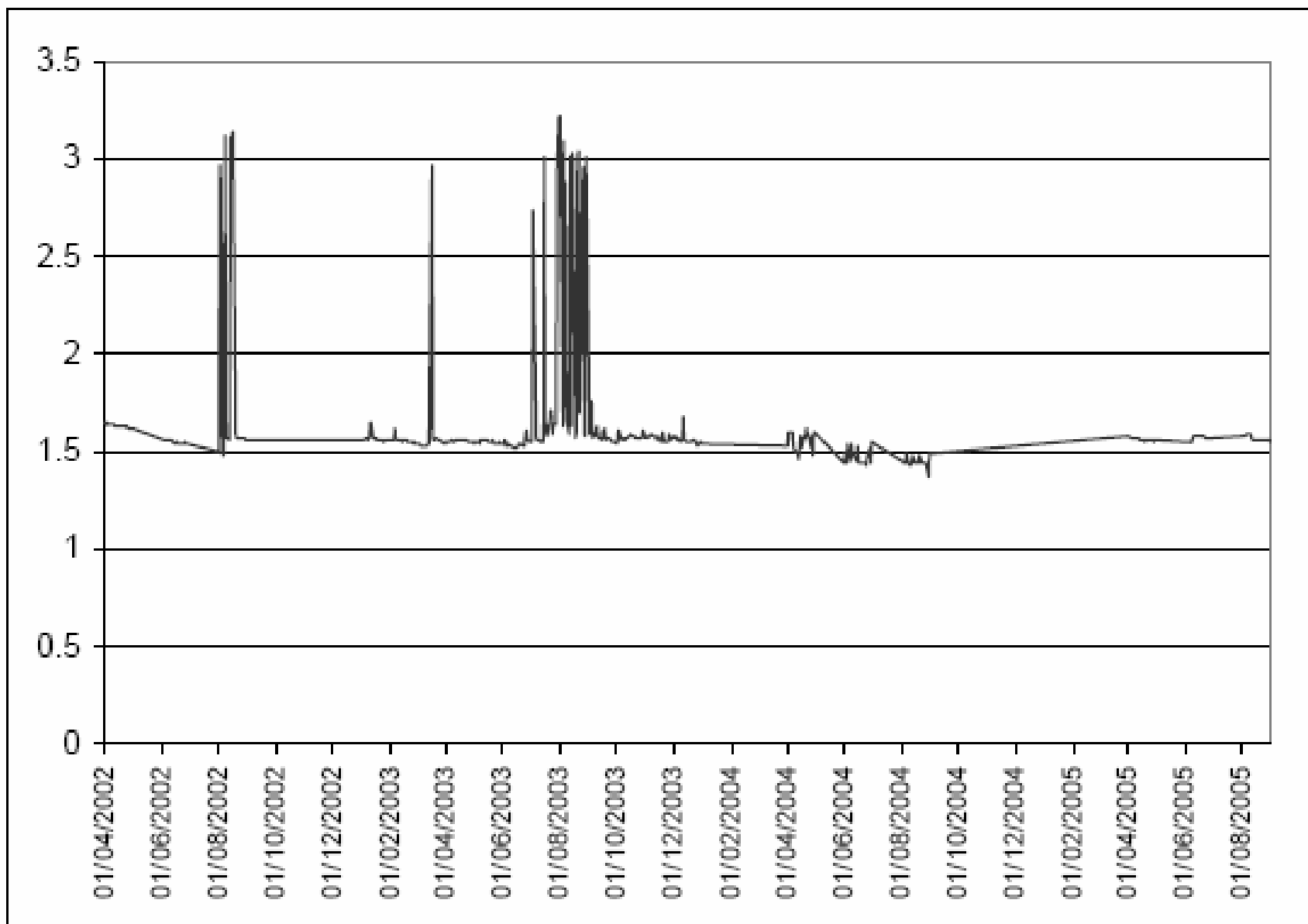
Proportion of trades for which there was a rise in bid or ask size refers to proportion where a change in quantity bid or offered occurred and no change in the quoted price occurred. The change in quoted size usually precedes the transaction by a few seconds. Number of buys and sells provided are the number of transactions that this refers to (other transactions may have occurred but will not have had a constant price w.r.t. preceding quotes). Last two columns display proportions of these trades that are also followed by a positive/negative return, where return is based on mid-quote returns between current and following transaction. We compare second and third columns and also fourth and fifth columns. For sells we would expect ask size to increase just before the transaction. If there is information in the limit orders we would expect a rise in ask size to more often precede negative returns.



A Natural Experiment

- US Treasuries June 2003
- Detailed limit-order book information from Cantor Market Data became visible on Reuters to a much wider audience
- Data product initially launched August 2002
- Both events followed by temporary increase in effective spreads

Figure 1 eSpeed: 5 year UST Benchmark Effective Spread 3rd Quartile²⁵





Summary of results

- Countries relying more on syndicate issuance and secondary market obligations on primary dealers have higher turnover on (transparent) MTS, low spreads
- But effective spreads in US lower than on MTS except for long benchmark
- High transparency → low trade size
- High obligations on dealers → poor execution quality for large trades
- Evidence of winner's curse, esp. in more transparent markets
- US 'transparency event' → effective spreads up



What the markets say

- 'If you don't have to pay for information, no one will want to be a market maker.'
- Taking positions requires risking capital, and if those positions are exposed, the risk becomes excessive, capital would be withdrawn (both for primary issues and in OTC secondary market)
- Pre-trade transparency (loss of anonymity, or even just market knowledge of prices quoted) would kill OTC markets
- Main dealers and big investors see no need for greater transparency (but they have more of it! – so that gives them market power w.r.t. portfolio managers and retail investors)
- Smaller issuers might lose out if they could not enforce obligations on primary dealers or if OTC market were to contract (because their issues are less liquid)
- Larger issuers more relaxed about possible effects on market structure



Conclusions

- Dealers prefer to operate on more opaque markets, might withdraw capital (hence liquidity) from more transparent markets (interviews and theory)
- Greater transparency is associated with lower trade size and higher spreads (empirical evidence)
- Some degree of opacity seems necessary to induce dealers to supply both liquidity and pre-trade information
- Note that highly distorted market structure is likely to change significantly over next 5-10 years as banks consolidate and electronic trading develops further

MiFID policy recommendation: *regulators should be cautious in seeking to create a homogeneous and transparent trading environment for government bonds*