

European corporate bond markets: Transparency, liquidity, efficiency

Presentation prepared for the seminar sponsored by ABI,
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Stocks & Bonds

- Stock & bond markets have different microstructures. Why? What's different about bonds?
- Abundant empirical literature on stock market microstructure: determinants of liquidity = inventory risk, adverse selection, competition, ...
- Relatively little on bonds. Yet bond markets are large (corporate bonds around 50% of GDP in Europe or the US, total bond market comparable in size to stock market.)
- Useful to better understand microstructure of corporate bond markets: low transactions costs => good investment opportunities for households & low cost of funds for firms.

Goal

- Understand workings of secondary market for corporate bonds in Europe.
- How does it work? How are prices discovered & trades arranged?
- How liquid & competitive is the market?
- What are the determinants of spreads? Risk, inventory, adverse selection, competition?
- How informative are the prices? Is the market transparent enough?

Method

- Interviews with large number of buy & sell side in London, Paris & Frankfurt (12 fund managers or wealth managers, 1 proprietary trader, 5 brokers/broker dealers, 2 primary market bankers, 11 dealers, 1 index provider, 1 issuer, 1 electronic platform organizer).
- Empirical study of high frequency quotes & trades data.
- Theoretical modeling.

Market structure

- OTC dealer market
- Institution wants to trade a bond:
 - Contact dealers (from 1 to 6)
 - Tell them what (kind of) bond, size & direction
 - RFQ (request for quotes), get quotes, pick the best
- Alternatively calls broker, who finds a match.
- Telephone negotiations, complemented by Bloomberg.
- Electronic platforms (promising but small market share)
 - Market Axess: replicates telephone system
 - Organizes sequence of mini auctions for customers
 - Reduces search cost/enhances competition

US experiment

- 2002: TRACE imposed post trade transparency. Initially for active bonds, then extended to others. Reporting time: 15 mn. (Exception: high-yield bonds with less than 1 trade per day: 2 to 4-hour delay.)
- Edwards, Harris & Piwowar (2006): large spreads, spreads drop by 5 to 10 cents.
- Goldstein, Hotchkiss & Sirri (2006): very clean experiment, confirms Edwards et al. 2 samples of BBB bonds: treatment sample post-trade transparent, control sample not. Spreads tighter in transparent sample. Number of trades not larger.
- Spreads increase with maturity & default risk (consistent with theory) and bond complexity. Decrease with trade size (unlike for stocks.)

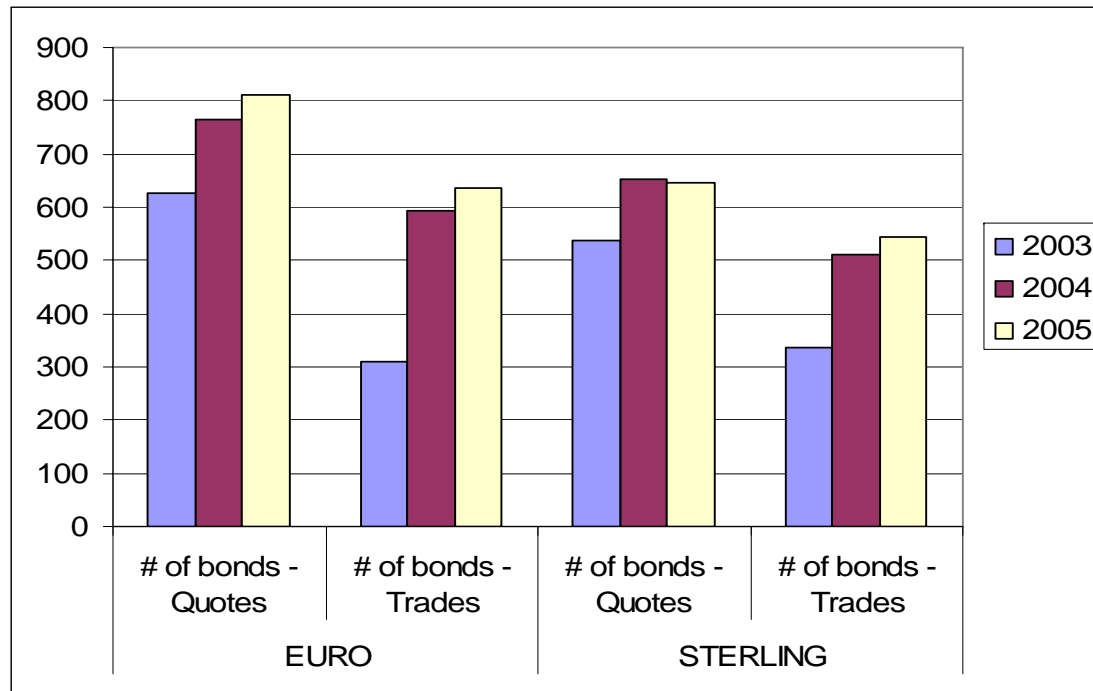
Why study European market?

- Are US stylized facts also descriptive of European market?
- Potential for differences:
 - 2 currency zones (€&£);
 - Eurozone integration: buy side from many countries access unified market; competition between sell side from different countries.
 - Currently no post-trade transparency in Europe.
- Policy issues: MIFID regulates transparency for stocks. What should be done for bonds?

Data

- International Index Company (IIC):
 - > 600 €bonds, > 500 £ bonds. 2003, 2004, 2005.
AAA, AA, A and BBB bonds. Plain vanilla.
 - Closing bid & ask quotes (average of 10 large dealers quotes).
- TRAX: (subset of IIC sample):
 - > 300 €bonds, > 300 £ bonds. 2003-2004-2005.
Discard bonds for which missing data on >15% days (mostly 2003).
 - All trades: price, direction quantity, time. After eliminating outliers: 1,952,244 observations.
 - Includes vast majority of professional market. Only small fraction of retail trades.

Number of bonds per year & currency



We started from IIC/Iboxx index in 2005.

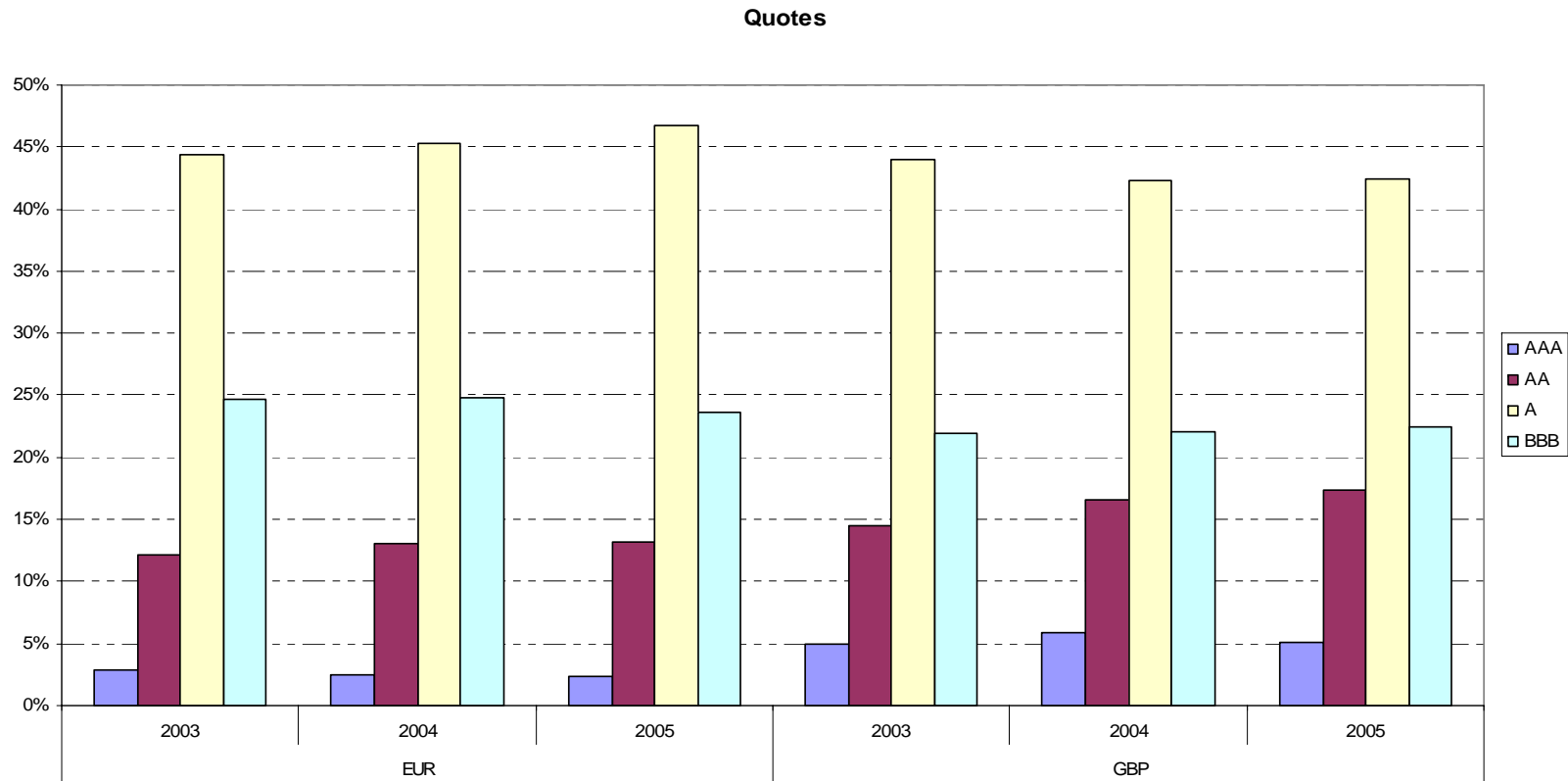
This ruled out bonds issued maturing in 2003 or 2004.

Some bonds issued in 2004 or 2005, not present in 2003.

Hence nb of bonds < in 2003.

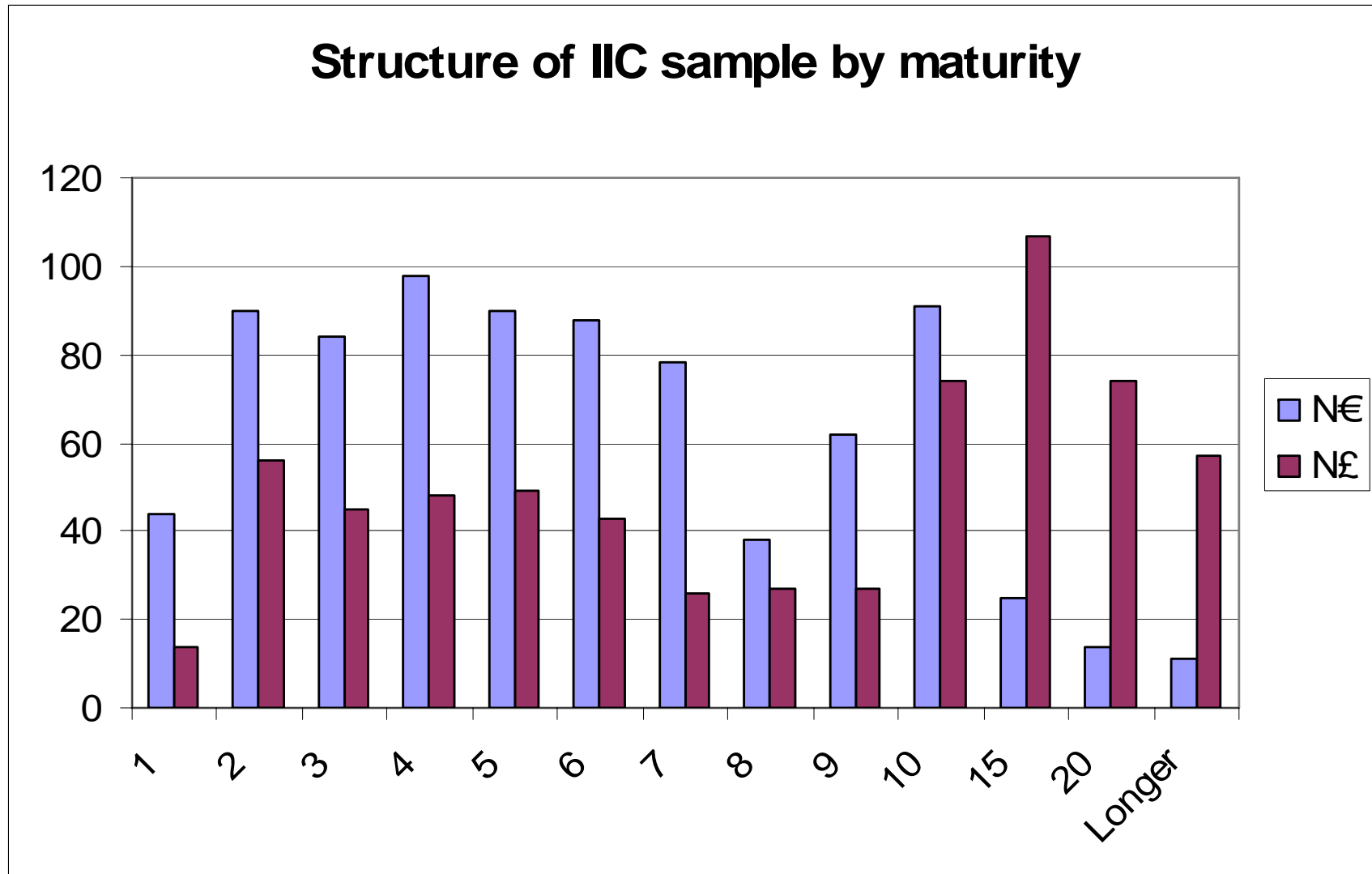
Bonds with trades = subsample of bonds with quotes.

Structure of sample by ratings



For all years & currencies, most frequent = A,
second most frequent = BBB. Very few AAA.
Similar in € & £, similar across years.

£ bonds have longer maturity than €



Comparison with US data

- Data comparable to TRACE data, e.g., maturity; but in TRACE larger number of bonds.
- Our bonds have issue size > 500 million. TRACE has smaller issues. Goldstein et al focus on large issues.
- We study AAA, AA, A & BBB. TRACE also includes lower ratings: studied by Edwards et al; Goldstein et al only consider BBB.
- Our bonds are plain vanilla. Same as Goldstein et al. Edwards et al. also consider complex bonds (callable, sinking, convertible, ...)
- TRAX includes few retail trades (unlike TRACE. In Edwards et al $> 60\%$ trades under £100,000.)
- Edwards et al and Goldstein et al study 2003 data.

Trading activity

Figure 3, Panel A: Median number of trades per day, €

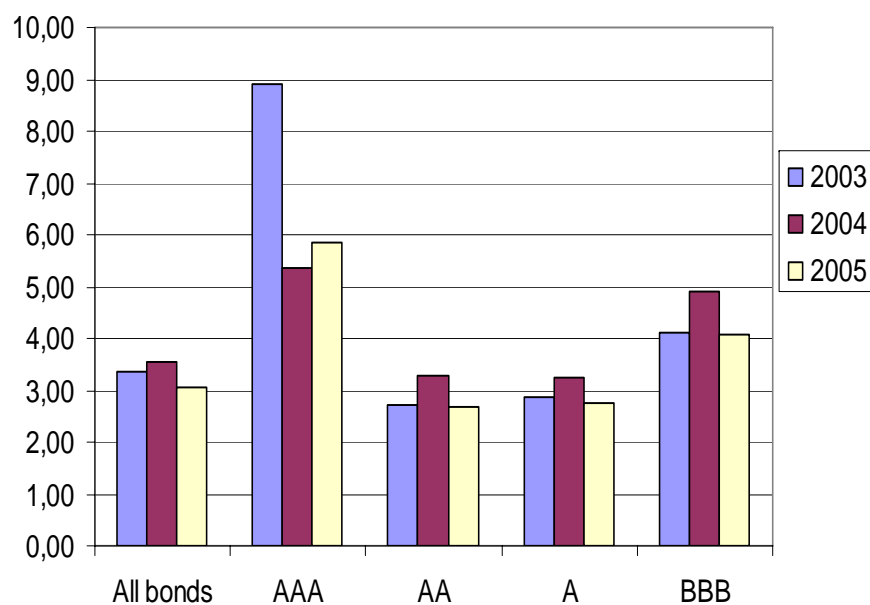
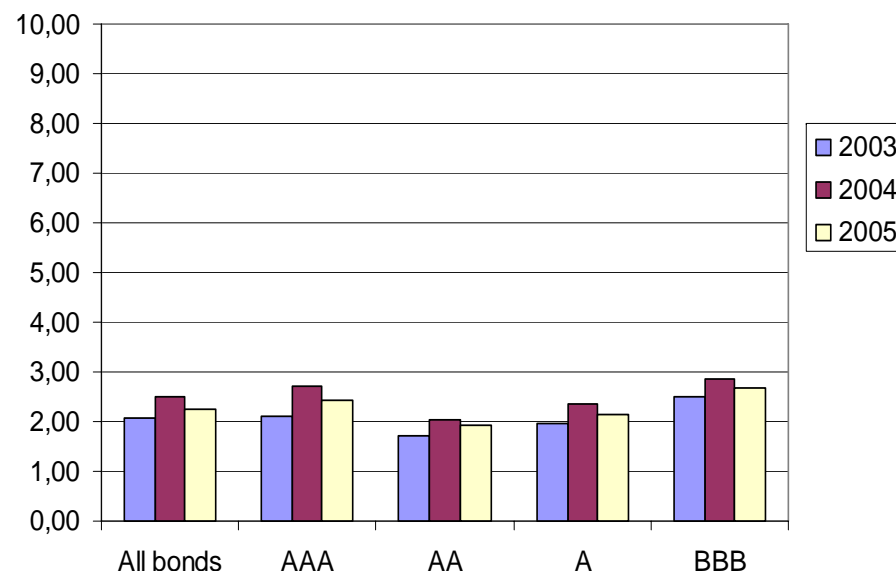


Figure 3, Panel B: Median number of trades per day, £



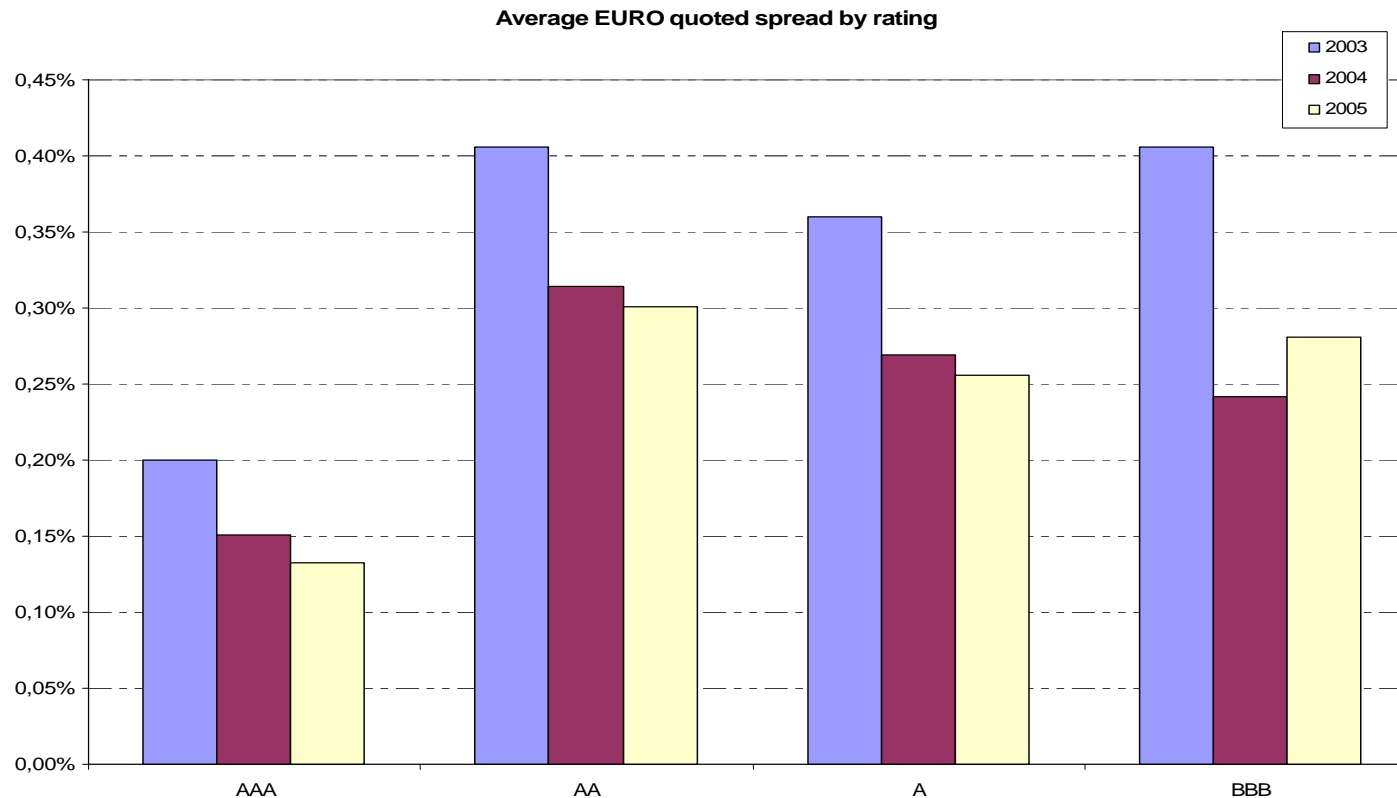
Average daily nb of trades/bond: 3 for €, 2 for £.

More trading than TRACE: for plain vanilla BBB,

Goldstein et al find 1 trade/day (& we don't have retail!)

Average € or £ volume per bond greater for € denominated

Quoted spreads for €denominated bonds

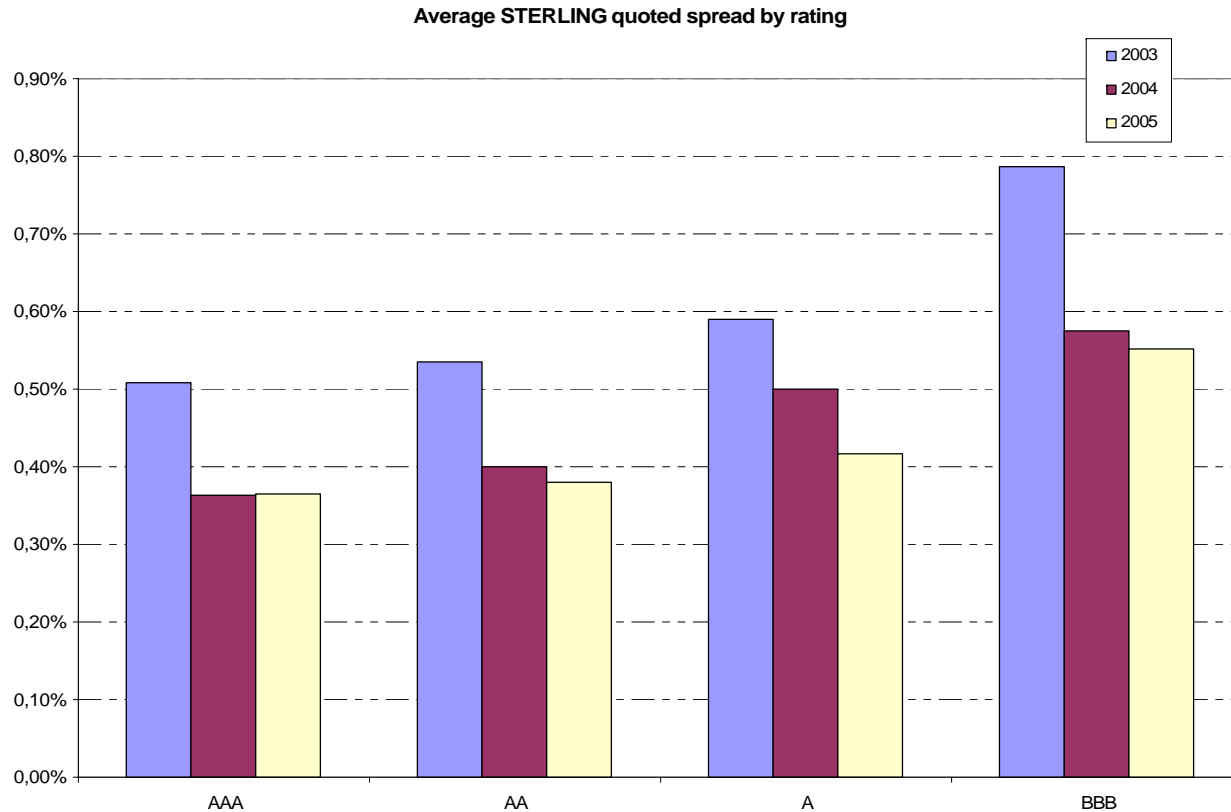


Bid-ask spreads vary between .15% & .40%.

Spreads tighter in 2005 than 2003.

Spreads tighter for AAA than other ratings.

Quoted spreads for £ denominated bonds



Bid-ask spreads vary between .35% & .80%.

> than for €

Spreads tighter in 2005 than 2003.

Spreads increase with default risk.

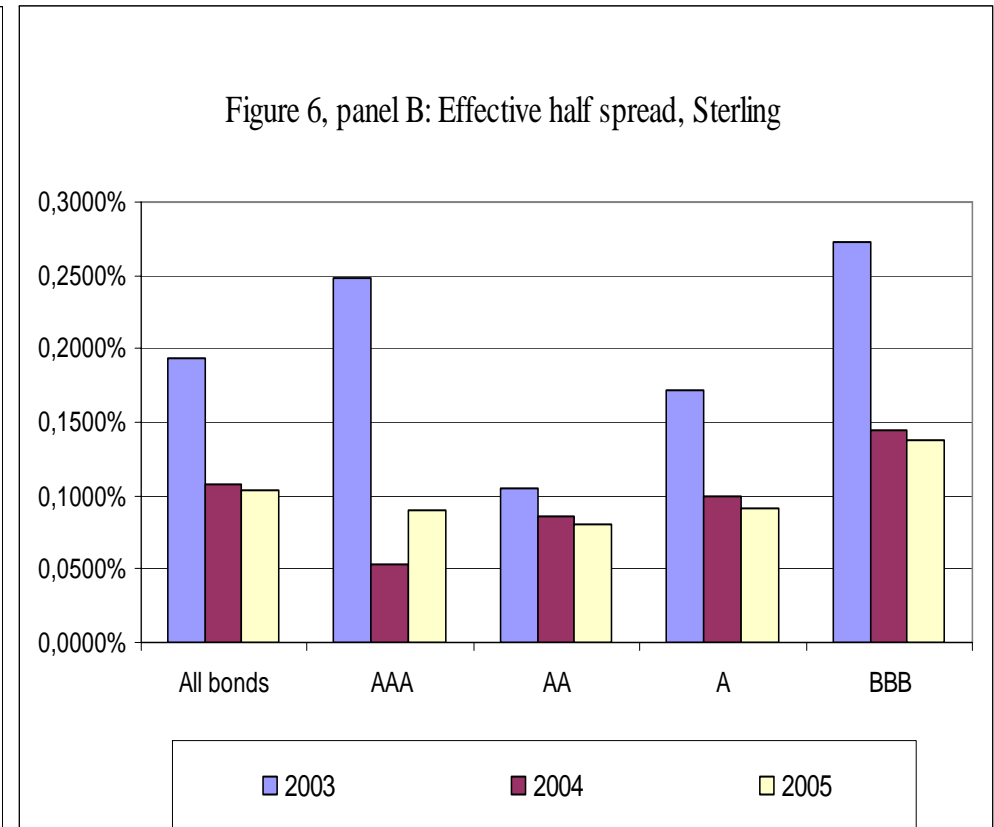
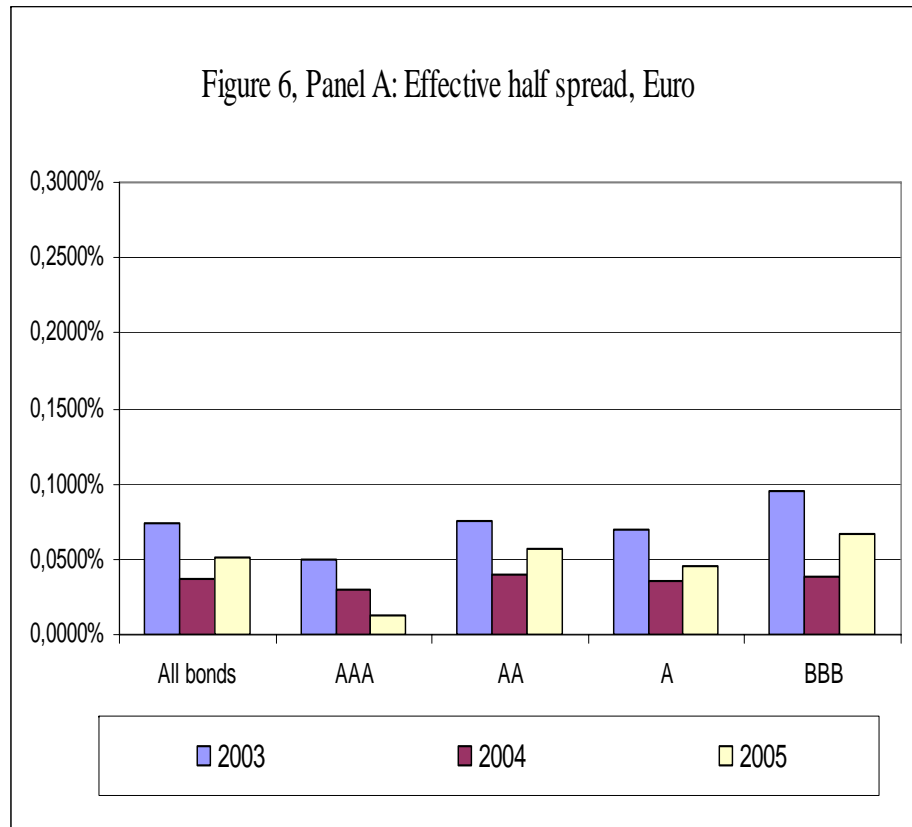
Stylized facts on quoted spreads

- Typical bid ask quote for €denominated bond in 2005: € 99.87 to 100.13.
- Wider for £ bonds. In part because of maturity, but not only.
- Quoted spreads increase with credit risk & maturity (as in TRACE.) Decrease in rating & increase in maturity
 - ⇒ increase in risk
 - ⇒ increase cost of market making: inventory bearing & adverse selection costs.
- Similar economic effects as for stocks.

Tighter effective spreads

- Average effective spread for €denominated bonds: 10 cents for (i.e., half spread = .05%)
- Larger effective spreads for £: 20 pence.
- Tighter than quoted spreads (which reflect averages quotes, while effective spreads reflect inside quotes).
- Effective spreads tend to increase with credit risk & maturity & decrease with trade size (// TRACE).

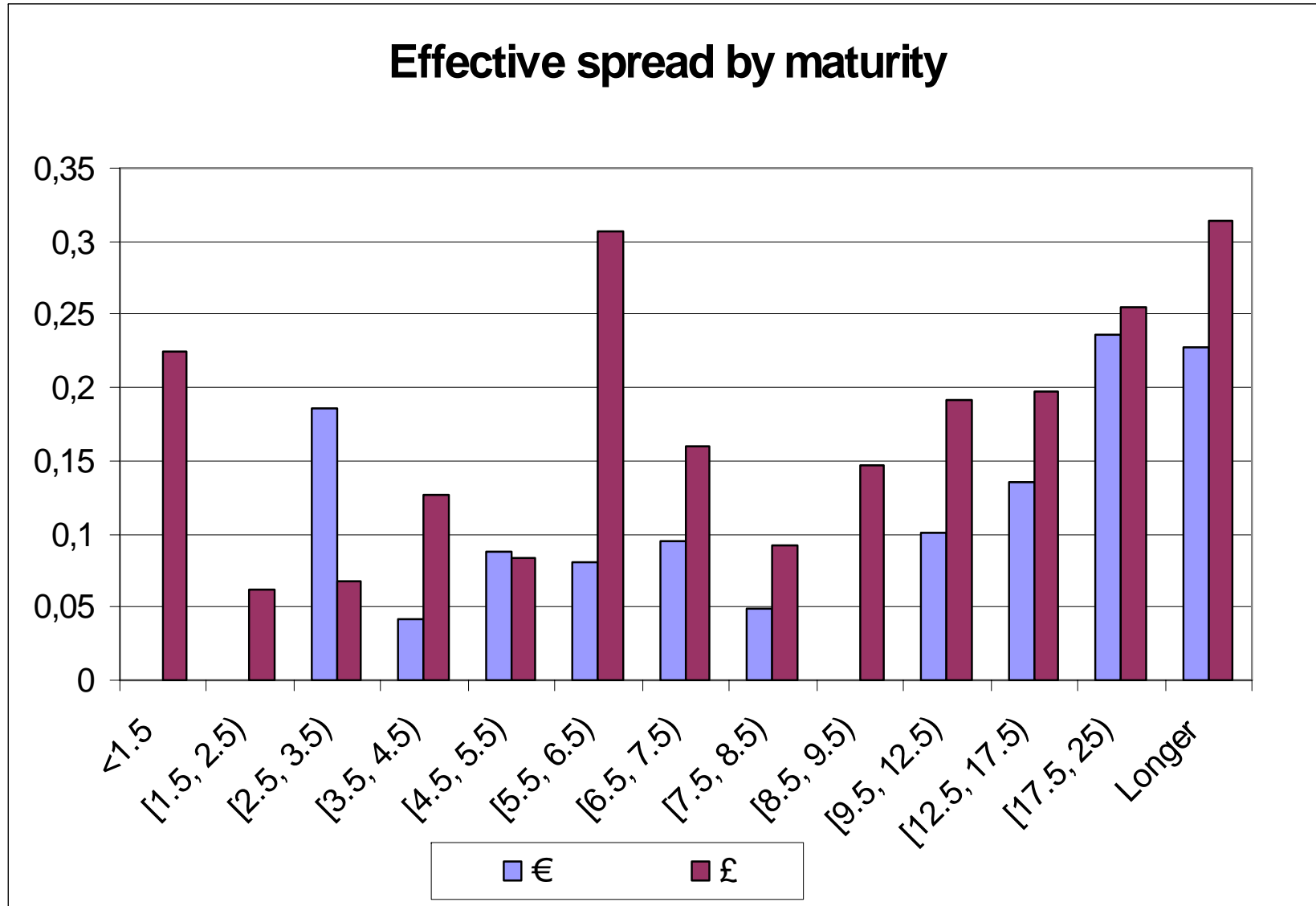
Effective spreads greater for £, for all ratings



Comparison with the US

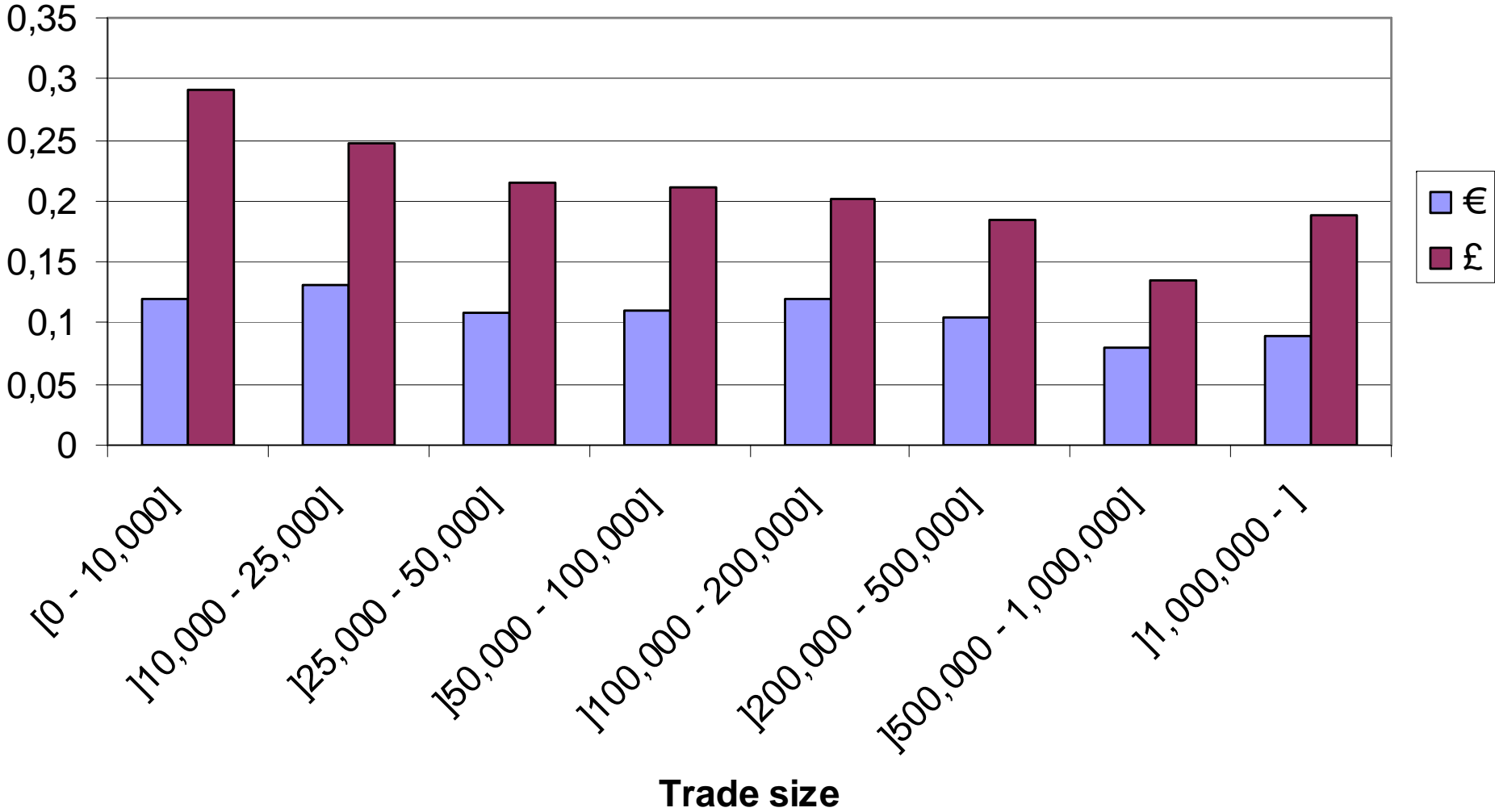
- For \$ 250,000 to \$1,000,000 trade size, Goldstein et al (2005) find half-spread .33% prior to TRACE & .18%.
- For size above one million, half-spread is .22% before TRACE & .135% after.
- In our sample of €bonds, same period (2003), effective half spread for size between €500,000 and €1,000,000 is: .053%.
- Above one million euros, effective half spread is .049%. For BBB bonds, in 2003, average half spread is .095% averaging across sizes, tighter for large size.
- Controlling for period and ratings, effective spreads lower for €bonds than post-trade transparent \$ bonds.

Effective spreads greater for £, for most maturities (2005 data)



Effective spread by trade size (2005 data)

In cents for bond price normalized to 100



Why is £ market less liquid?

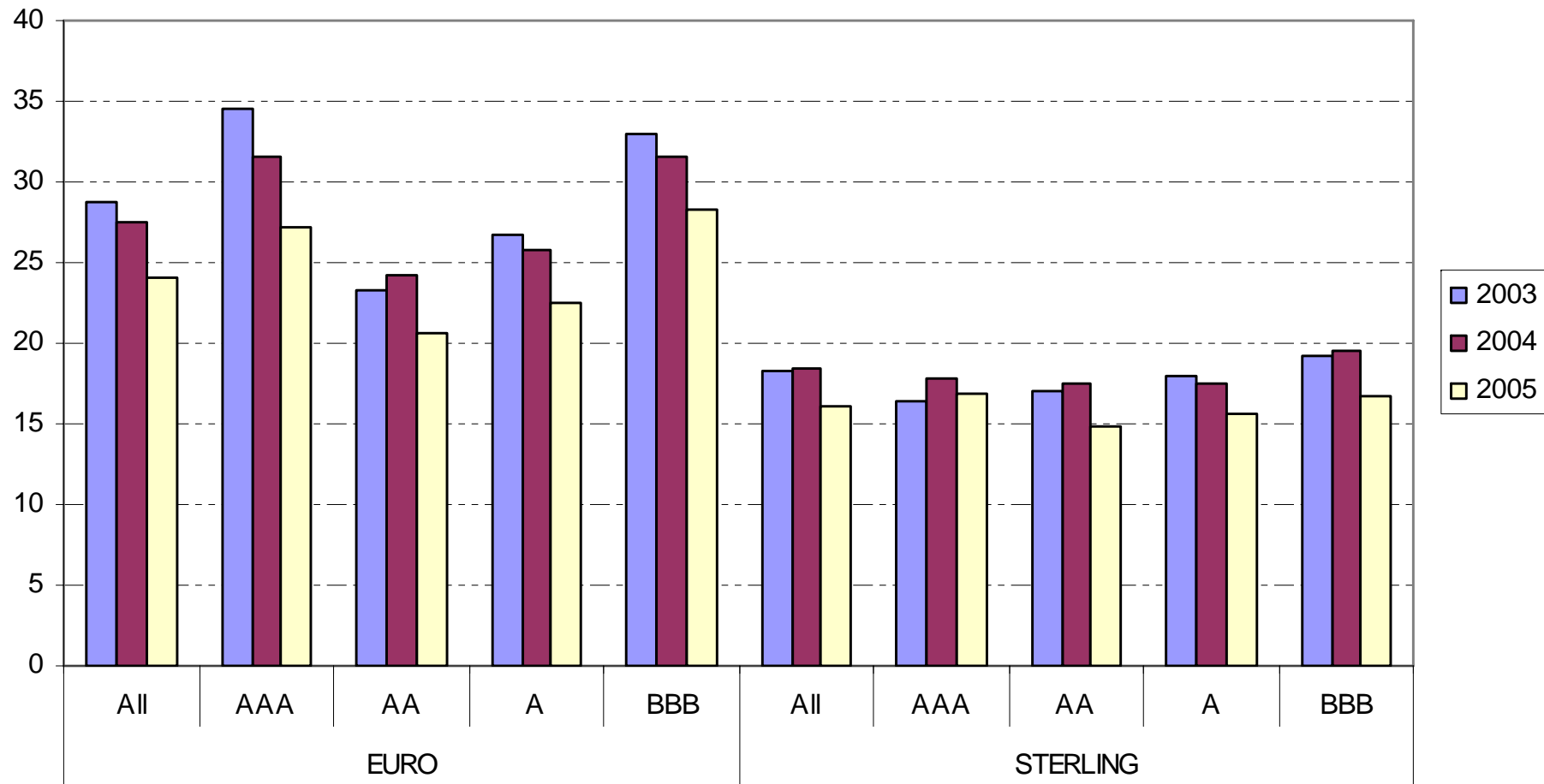
- Eurozone rather active:
 - Foreigners invest in €zone: greater variety of bonds.
 - Eurozone traders invest across €countries.
- £ bonds attract more limited number of investors, often buy & hold:
 - UK investors in £ market = insurance or pension funds (cannot invest in foreign currency) or UCITS with buy & hold orientation.
 - Limited trading activity/demand for liquidity.
 - Limited supply of liquidity (few market makers).

Competition to supply liquidity

- Evidence on spreads and discussion with market participants suggest competition to supply liquidity stronger in € than in £ and in \$.
- In the US, 6 banks make most of the market. In €zone: 20 large banks from different countries compete.
- To provide evidence on this, we compute:
 - Number of dealers with at least 1 trade
 - Market share (in volume) of most active dealer
 - Market share (in volume) of 3 most active dealers
- Statistics computed for each bond. We report the average across bonds.

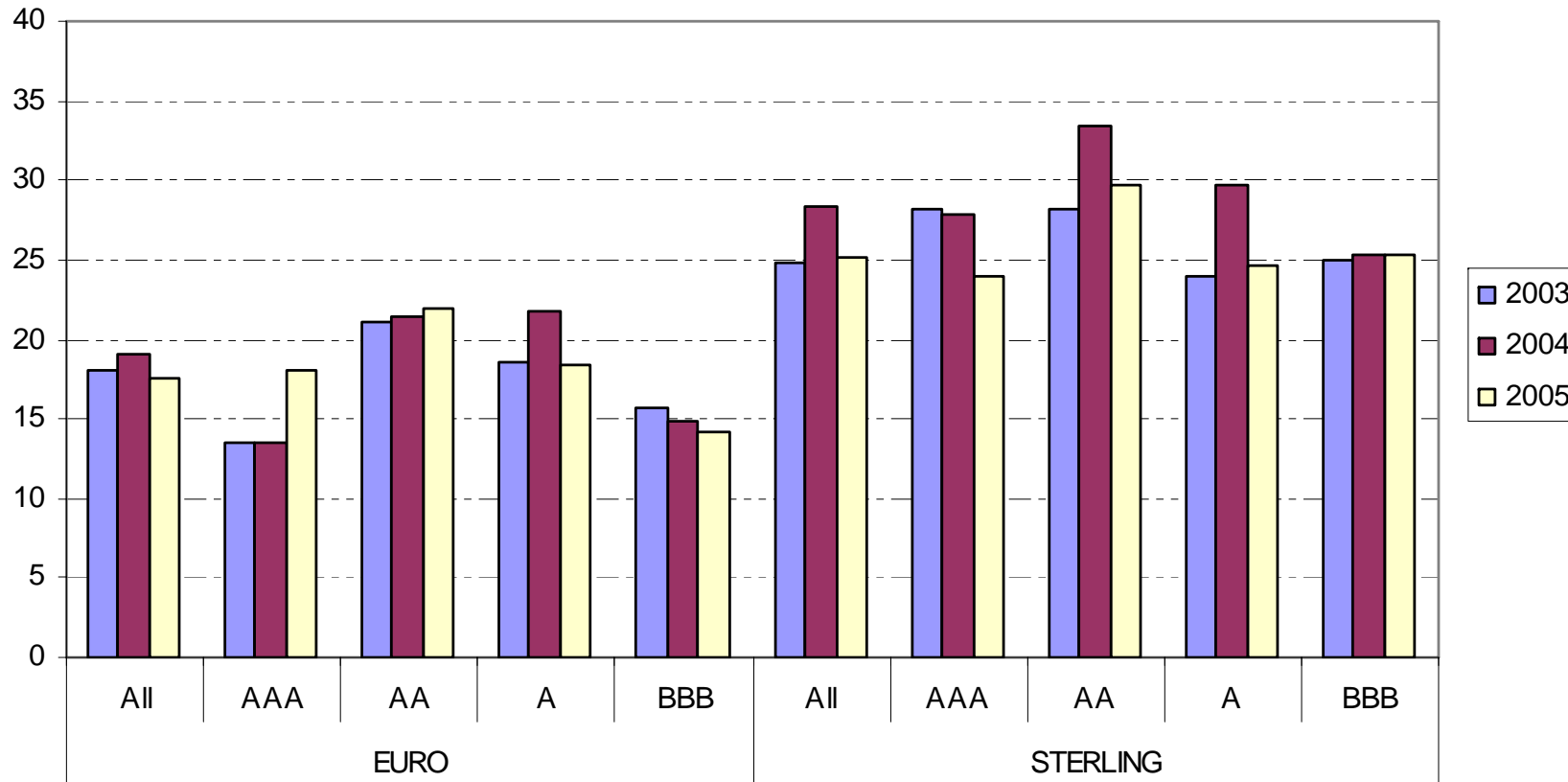
Number of active dealers greater for €denominated bonds (25 on average) than for £ (17 on average)

Figure 8: Number of market makers with at least one trade



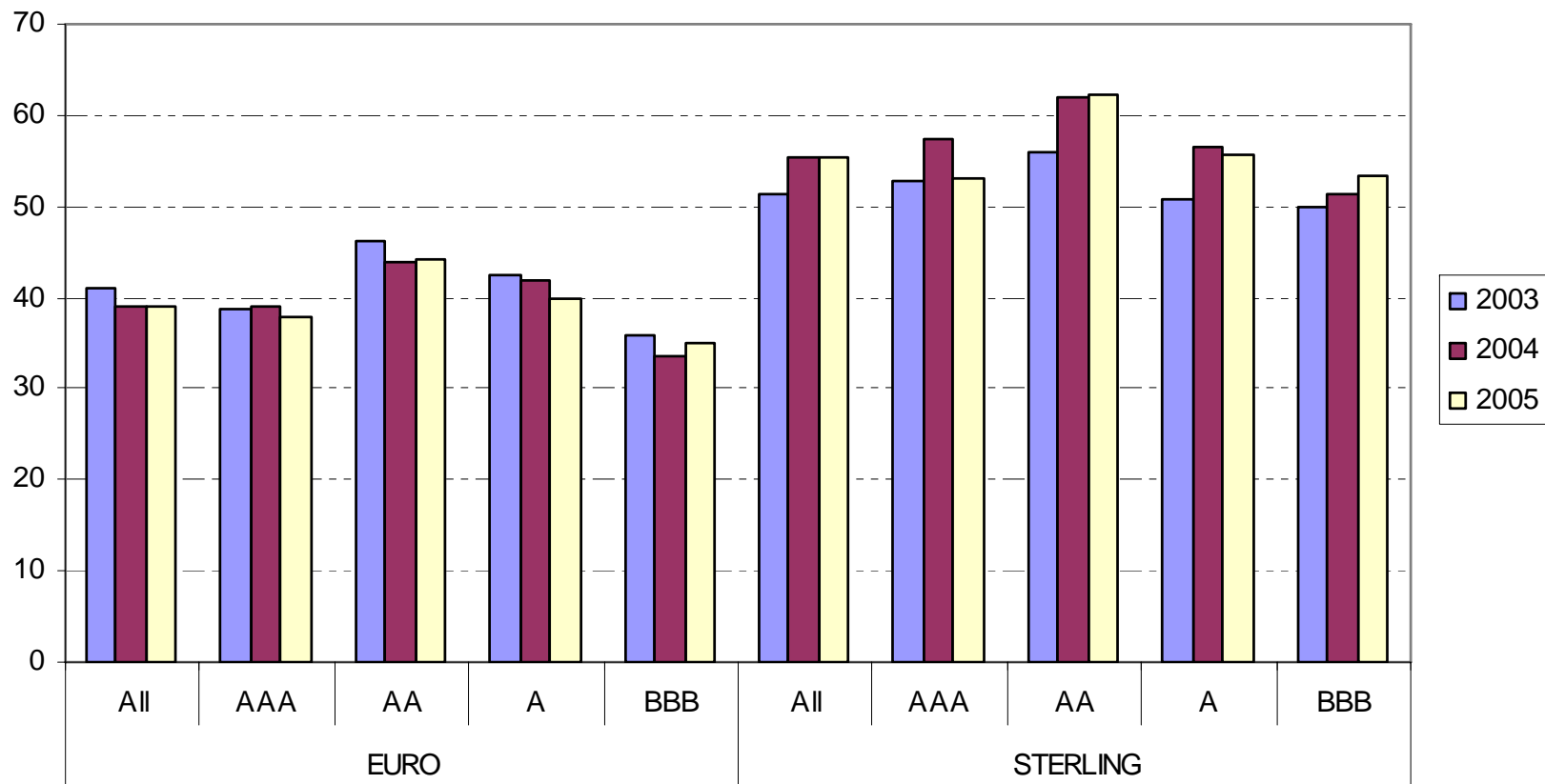
Market share of most active dealer lower for €bonds (17% on average) than for £ (265% on average)

Figure 9: Market share (%) of the most active dealer



Market share of 3 most active dealers lower for €bonds (40% on average) than for £ (53% on average)

Figure 10: Market share (%) of 3 most active dealers



Information content of trades

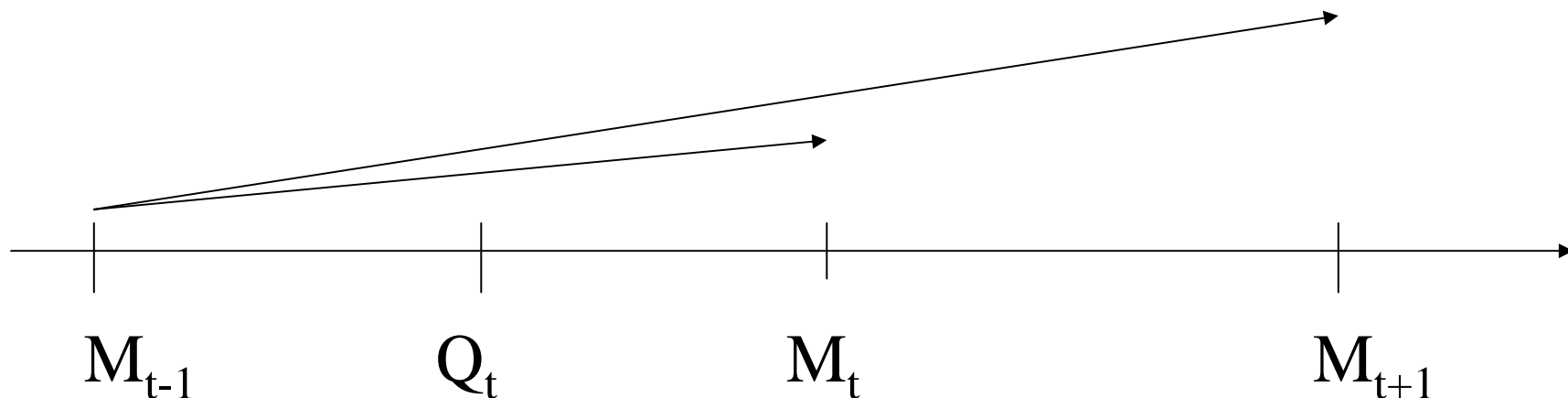
- Is there adverse selection on common values in bond markets?
- Unlikely if no default risk, but, with default risk, trades could signal information (DeMarzo & Duffie, Ecoa 1999, Biais & Mariotti, Restud 2005.)
- Empirical approach: Estimate how much midquote increases after customer purchase. By how much it decreases after customer sale.
- Average information content: 1 cent for €, 2.2 pence for £. Significantly different from 0.
- But small relative to magnitude of spreads.

Determinants of the information content of trades

- In line with theory, greater info content for lower ratings: 1.65 cent for €, 3 pence for £.
- Info content greater for £: less activity => less research & analysts following, less widely disseminated information, more information asymmetry.

Information content & transparency

- Information content of trades larger and more significant if measured with next day midquote than this day's midquote.
- It takes more than one day for market prices to reflect information content of trade.
- Likely to stem from limited post trade transparency.



Differentiating information content from inventory risk

- Theoretically, short term increase (resp. decrease) in quote after purchase (resp. sale) can stem from inventory effects.
- But inventory effect should have little impact on average midquote.
- And inventory effect should decay with time: opposite to what we find.

Figure 7, Panel A: Information content of trades by transaction size, euro

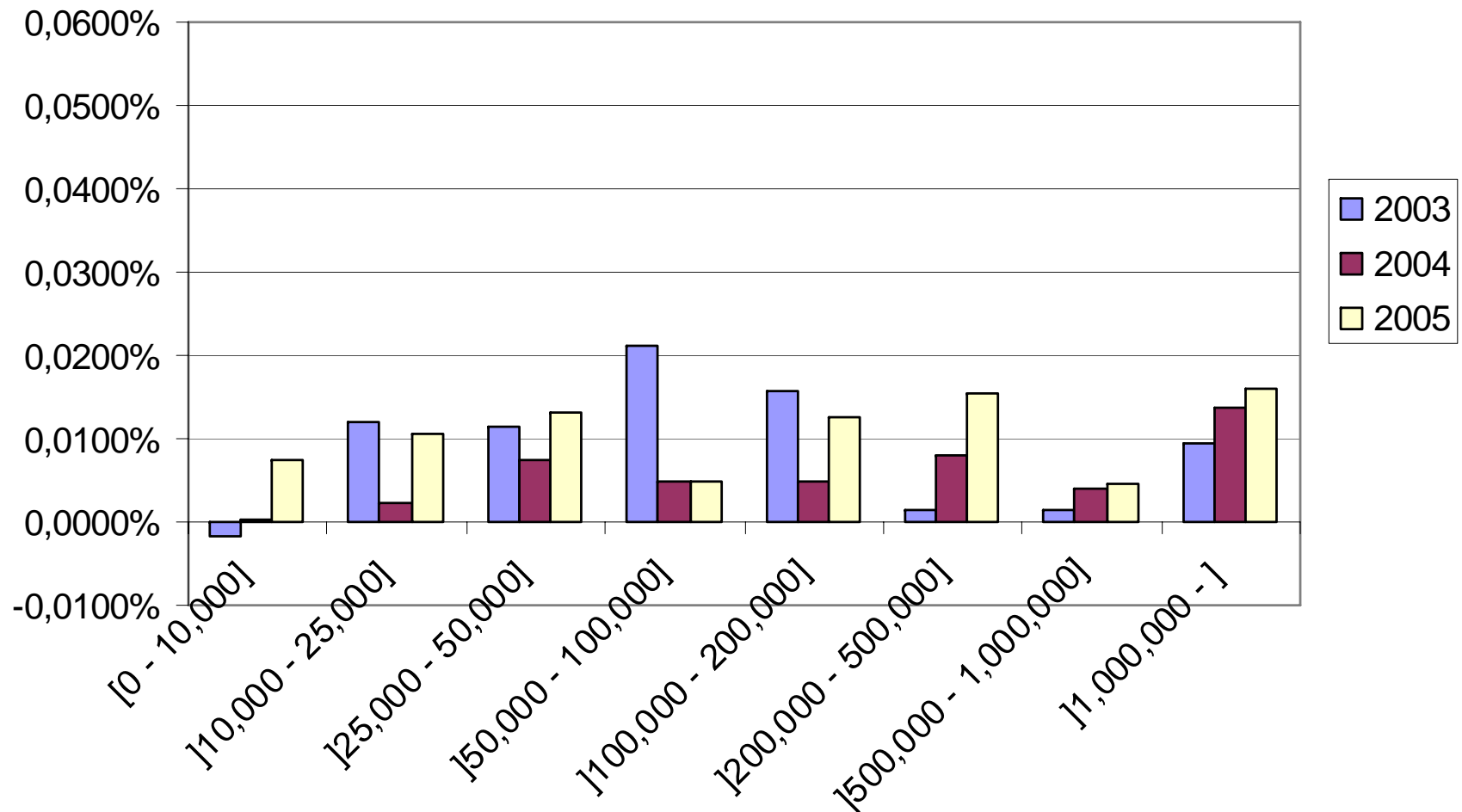
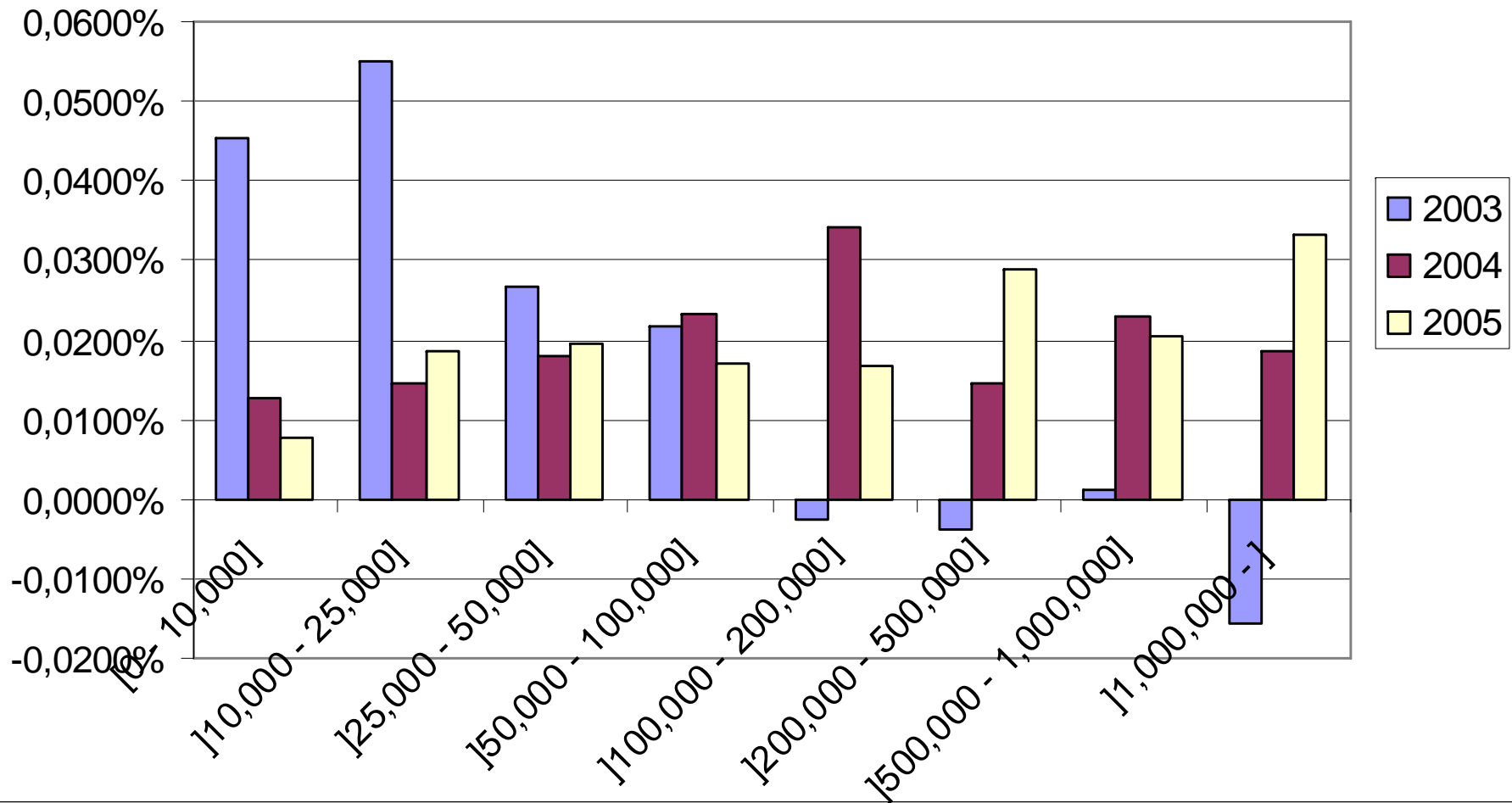


Figure 7, Panel B: Information content of trades, by transaction size, Sterling



Conclusion

Determinants of spreads: Inventory risk (default rate, maturity), adverse selection risk (to a small extent) & competition (to a large extent.)

More activity & tighter spreads in € than £: larger market, greater liquidity supply. Positive consequence of monetary unification.

Liquidity of Euro market > US market (even after TRACE dissemination): competition in liquidity supply.

Information content of trades impounded in prices after delay: likely stems from opacity.

Implications

England should join €

Competition is good.

Pre-trade transparency could be disruptive: current liquidity seems rather good (at least in €). Pre-trade transparency would require radical change in market structure.

Post-trade transparency:

- could improve information dissemination & foster competition.
- Risk that dealers would withdraw not serious for relatively active issues and limited transparency.
- Report yield spreads (but not identity nor size) after delay for small medium trades, longer delay for large trades.