

Measuring Liquidity in the Bond Market

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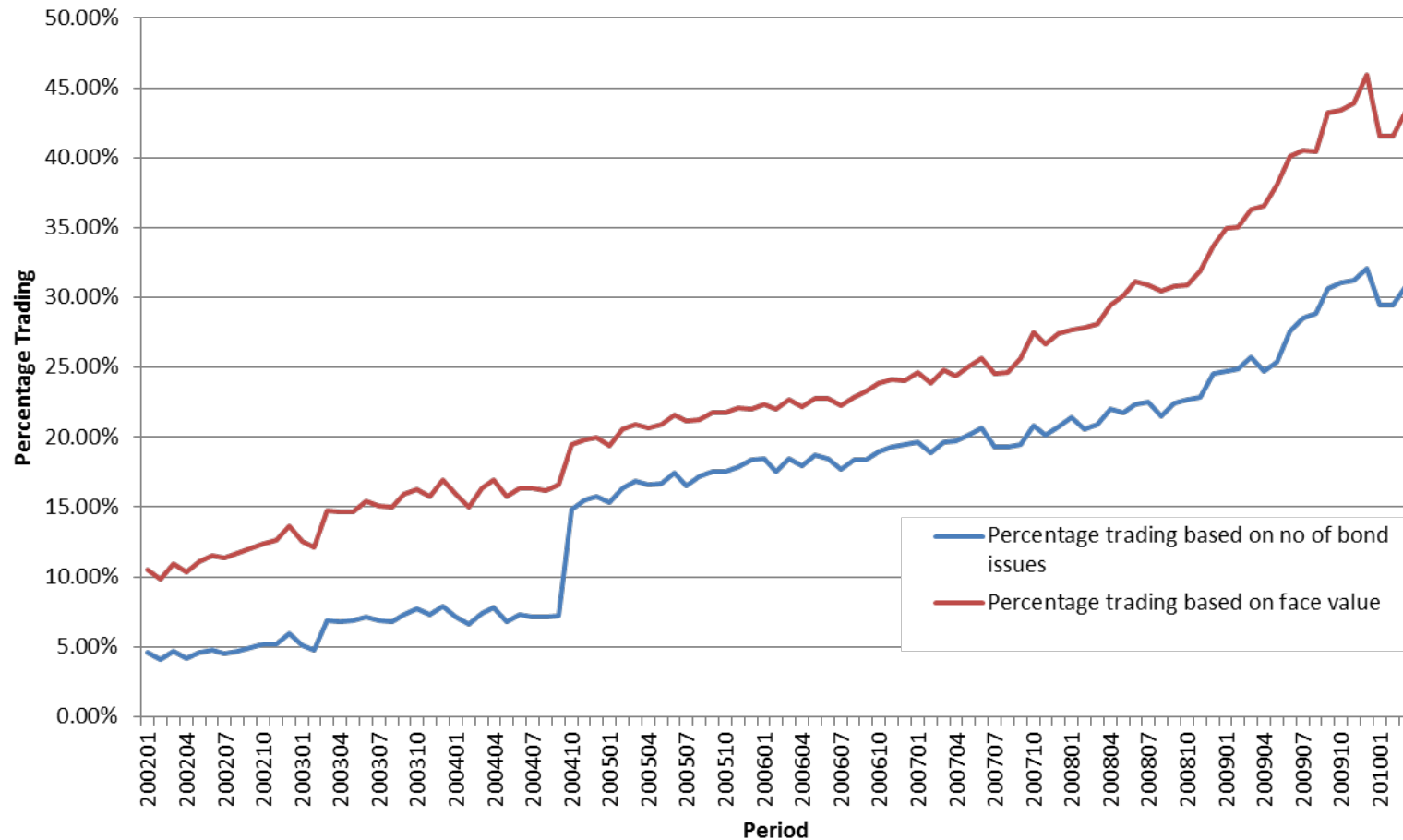
Sources of bond transactions data:

- **TRACE system** (started in 2002). Implemented in three phases - Full coverage of bond transactions by Dec 2004.
- **Mergent FISD** (NAIC transactions from 1994). Covers only transactions by insurance companies.

Use NAIC transactions to augment TRACE before Dec 2004.

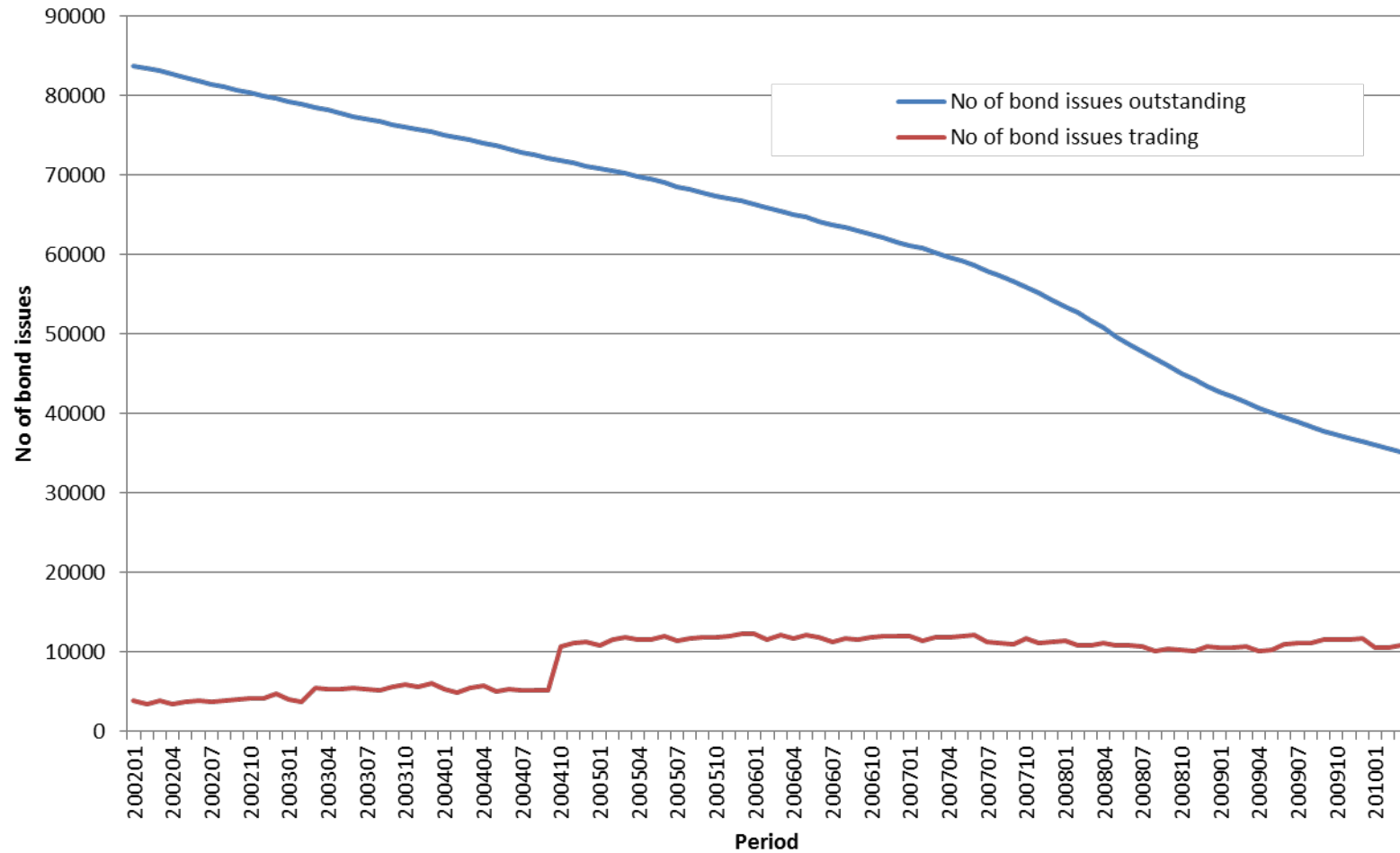
Bond Trading Over Time

Percentage of outstanding bonds trading

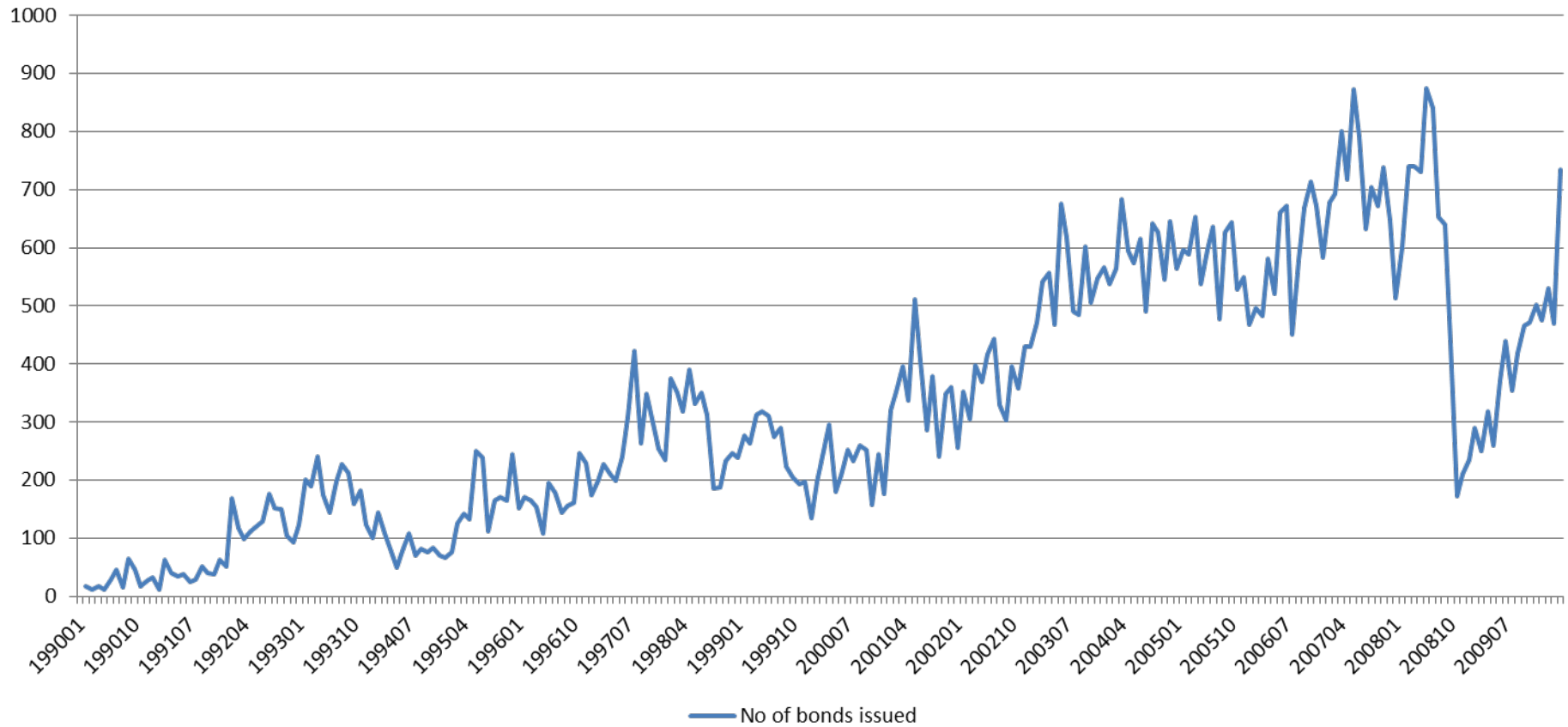


Did trading really improve?

Number of bond issues outstanding and trading

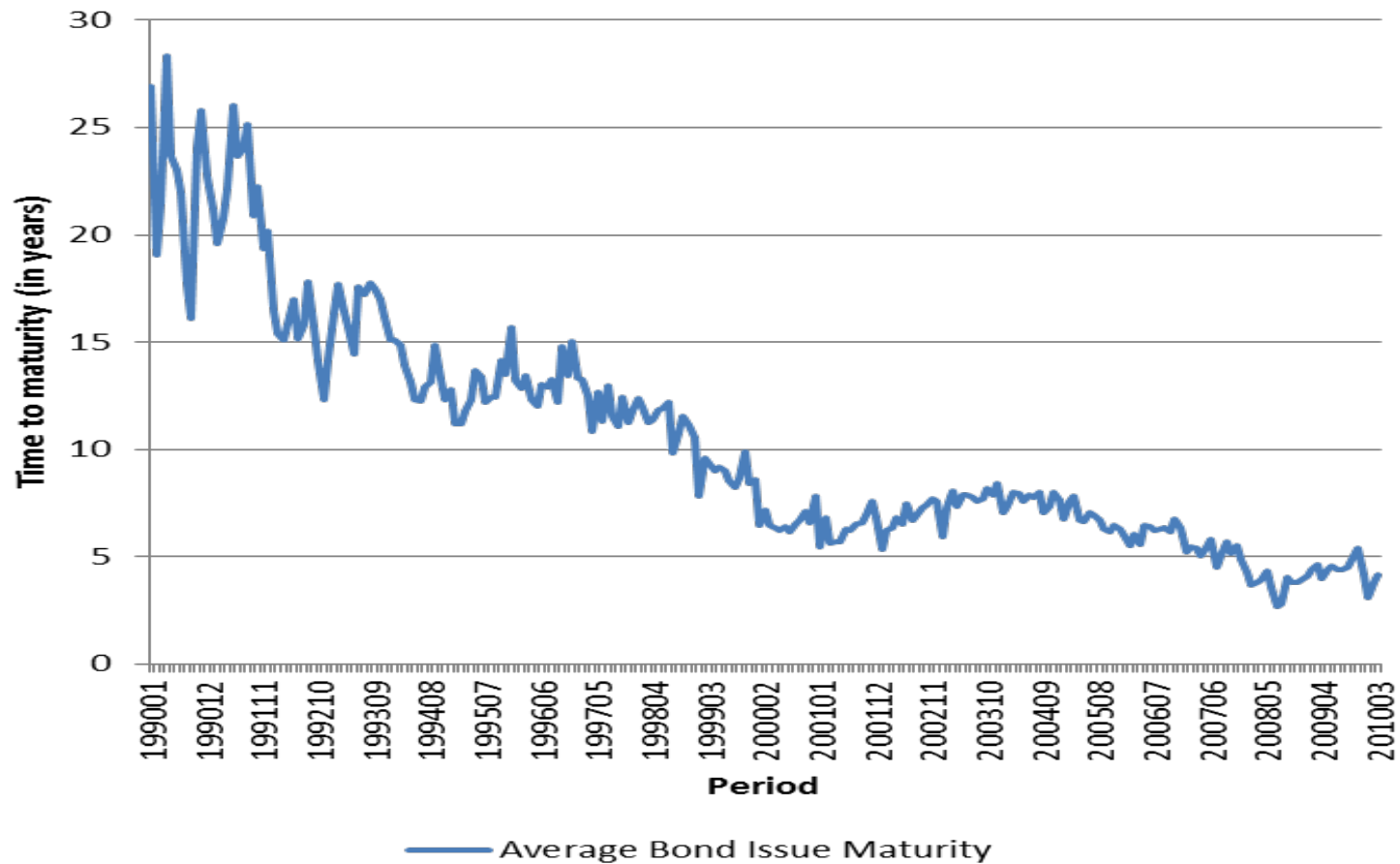


Bond Issuance Activity Since Jan. 1990



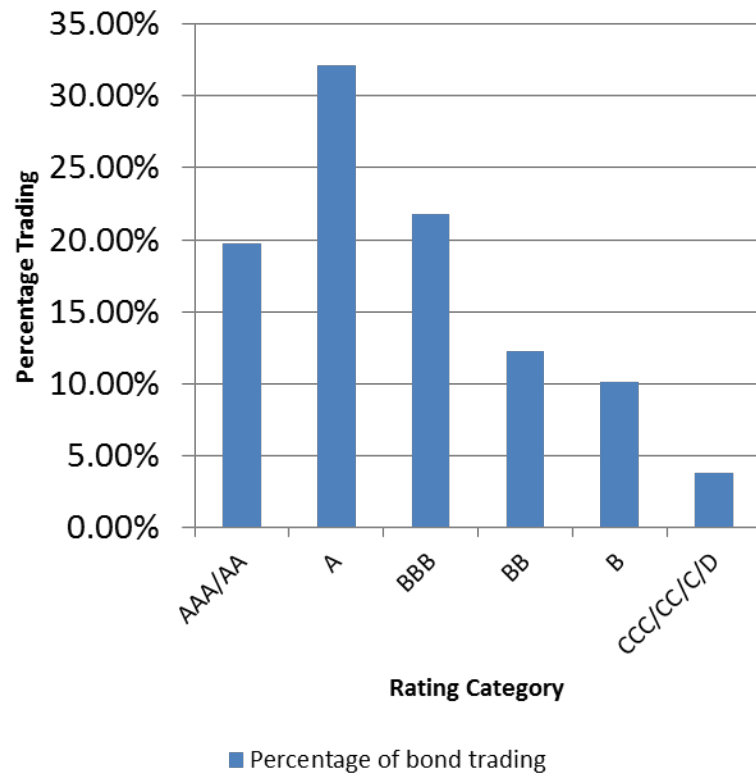
Changes in Bond Maturity

Average Maturity at Issuance Time

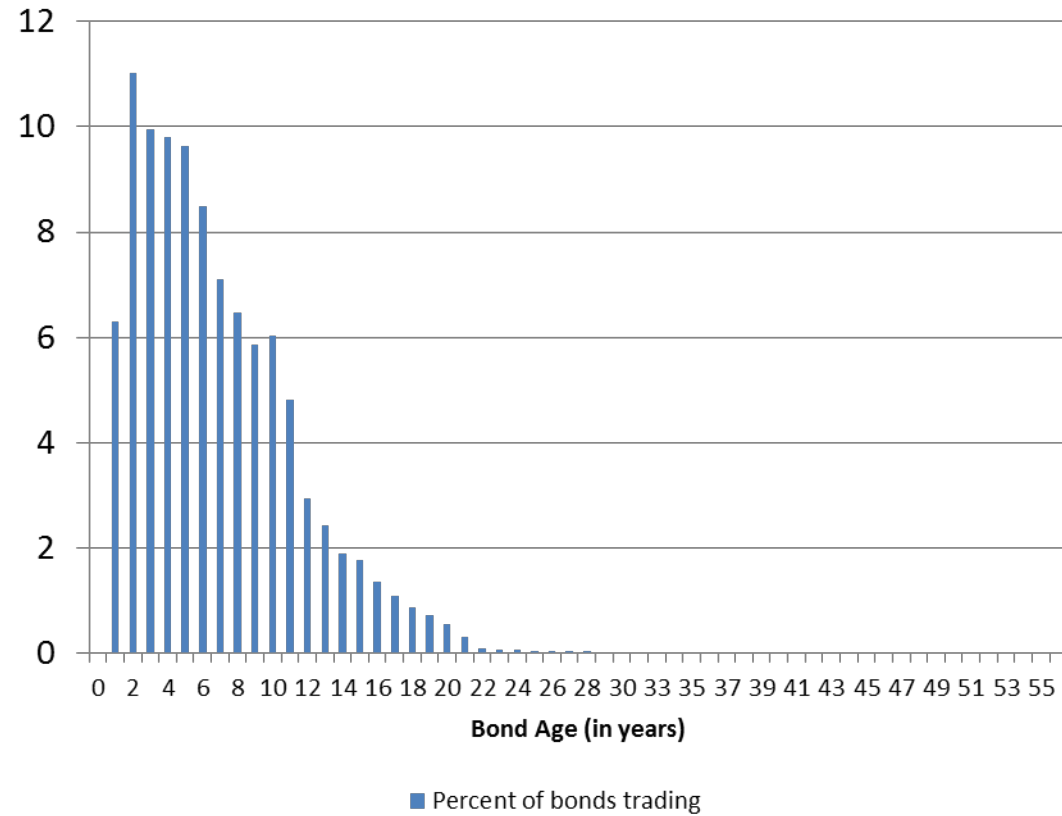


Bond Trading By Characteristics

Bond Trading by Rating Category



Bonds Trading by Age



Bond Trading Statistics

Variable	Bond-Year Observations	Mean	Std Dev	25th Pctl	50th Pctl	75th Pctl
Number of Days With Trading During a Year	159,513	34	54	2	10	39
Percent of Bond Face Value Traded During a Year	159,513	23%	30%	3%	12%	29%
Number of Transactions During a Year	159,513	190	767	4	21	94

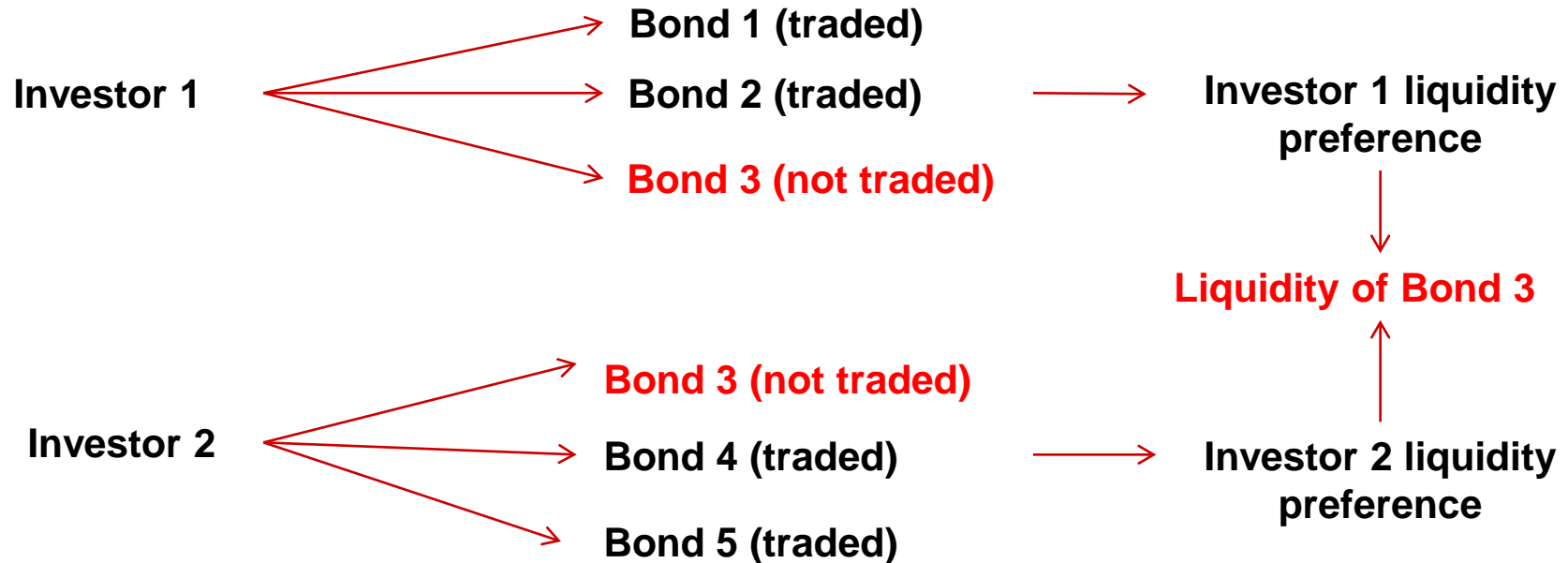
Bushman, Le and Vasvari (2010)

- Test the model of Acharya and Pedersen (2005) in the bond market.
- Bond spreads should reflect:
 - *A premium to hold illiquid bonds - Liquidity Level*
 - *A premium to hold bonds whose liquidity co-moves with the market – Systematic Liquidity Risk*

Bushman, Le and Vasvari (2010) Implied Liquidity Measures

- Based on bond holders' liquidity preferences
 - Allow computation of liquidity levels for bonds that do not trade
 - Allow estimation of systematic bond liquidity risks
- We use ***Morningstar & NAIC Bond Holdings*** Databases

Computation of Implied Liquidity Measures



■ Liquidity level for bonds that trade

– Amihud (2002): $\frac{1}{N} \sum \frac{|R_t|}{\text{Daily Trading Volume}}$

– Roll (1984): $2 \times \sqrt{-\text{cov}(R_{t-1}, R_t)}$

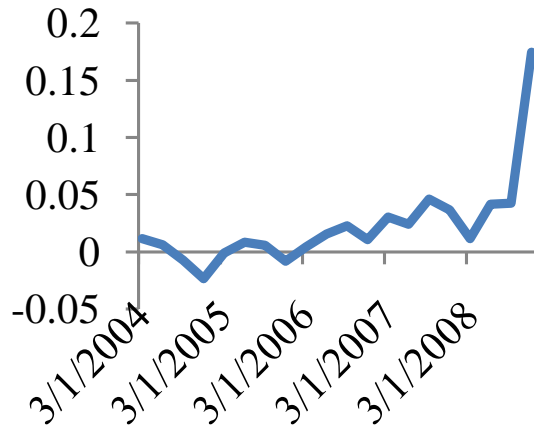
– Price Dispersion (Dick-Nielsen et al. 2009): $\frac{1}{N} \sum \frac{P_{i,\max} - P_{i,\min}}{P_{i,\max}}$

Coverage (no of bond issues) by Year

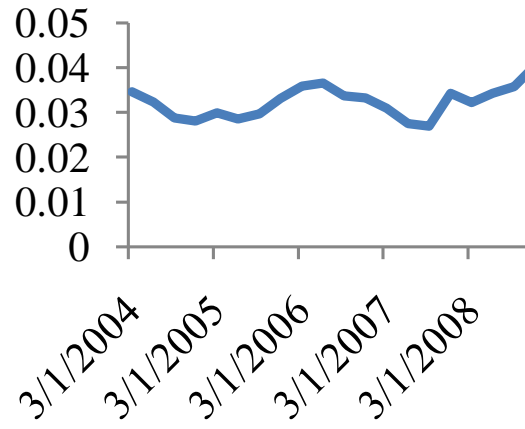
	2003	2004	2005	2006	2007	2008
Amihud	1388	2058	3571	3329	2881	2737
Roll	1102	1530	2543	2337	1961	1916
Dispersion	924	1260	2191	1992	1737	1983
I-Amihud	7326	7754	7655	7622	7575	6980
I-Roll	7284	7723	7633	7599	7538	6953
I-Dispersion	7318	7750	7653	7617	7564	6974

Premium in bond spreads for the liquidity level

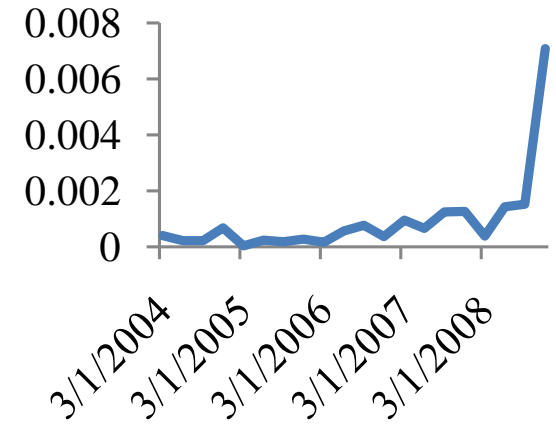
Price of Residual Liquidity



Quantity of Residual Liquidity



Residual Liquidity Premium

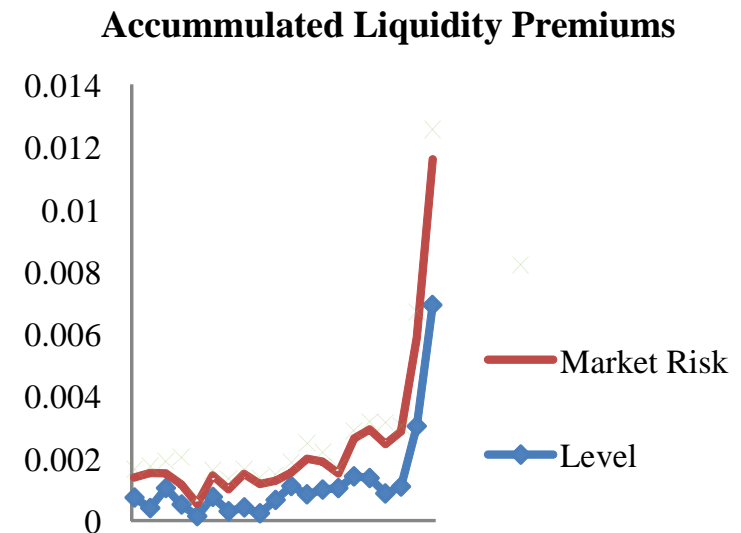
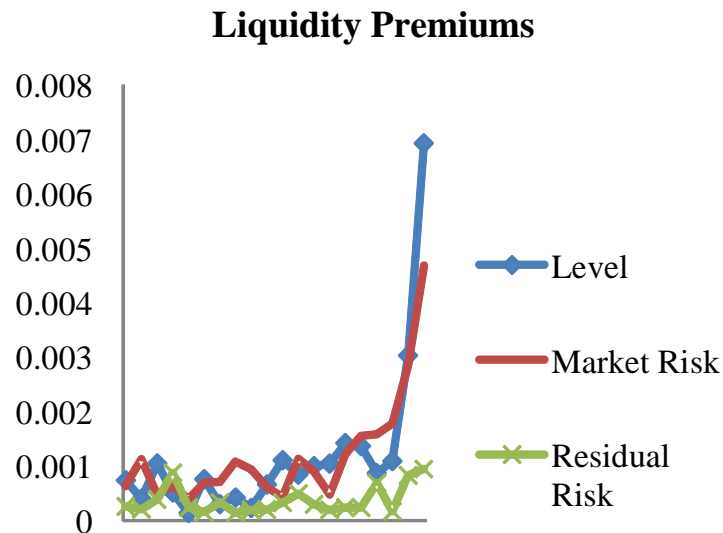


Residual Liquidity is computed by orthogonalizing on: (1) current quarter 5-year CDS spread, (2) recovery rate, (3) term structure level, (4) curvature, (5) slope factors, (6) industry, (7) ratings and (8) bonds fixed effects

Impact of liquidity risks on bond spreads

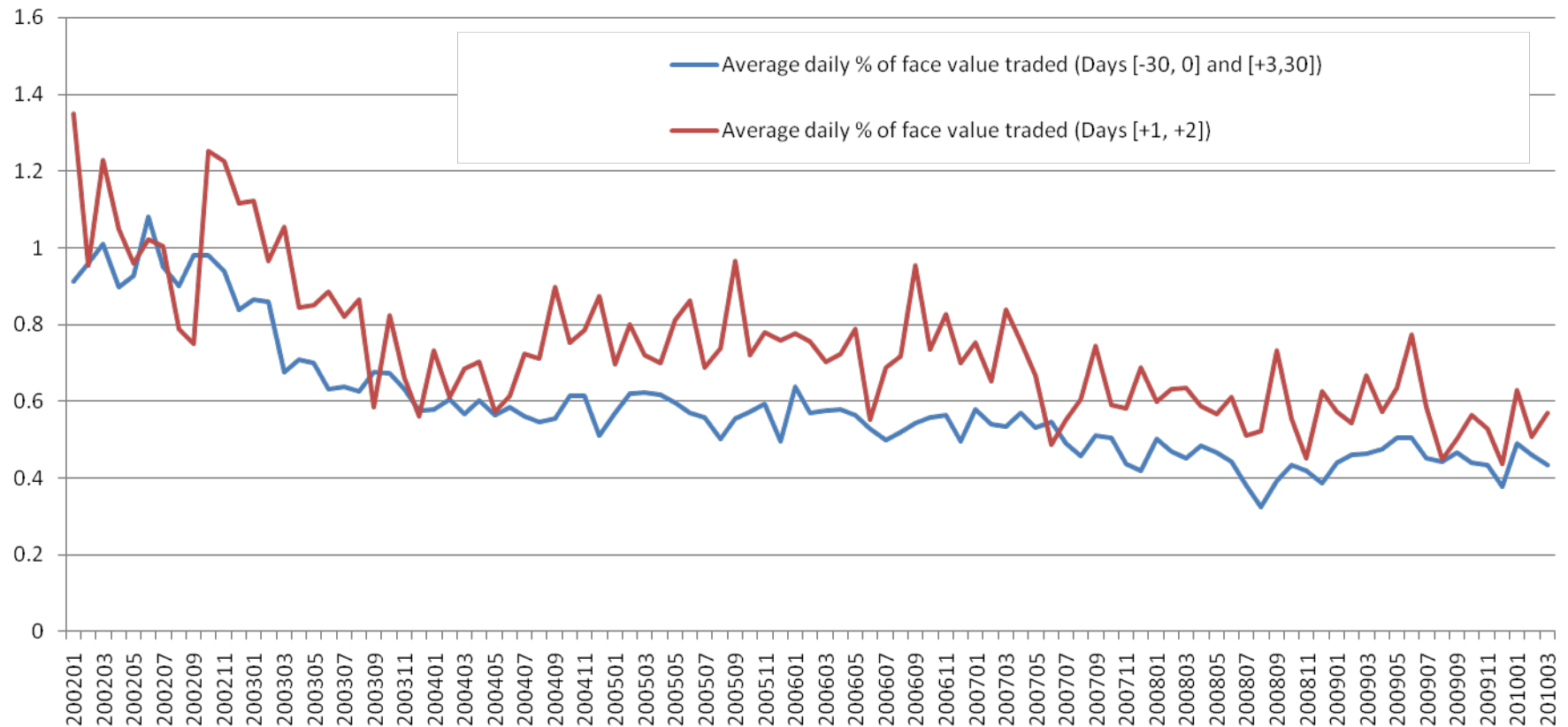
- **Liquidity risks:**
 - covariance between changes in individual bond liquidity levels and changes in bond market liquidity scaled by variance of bond market returns.
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Time series plot of liquidity premiums

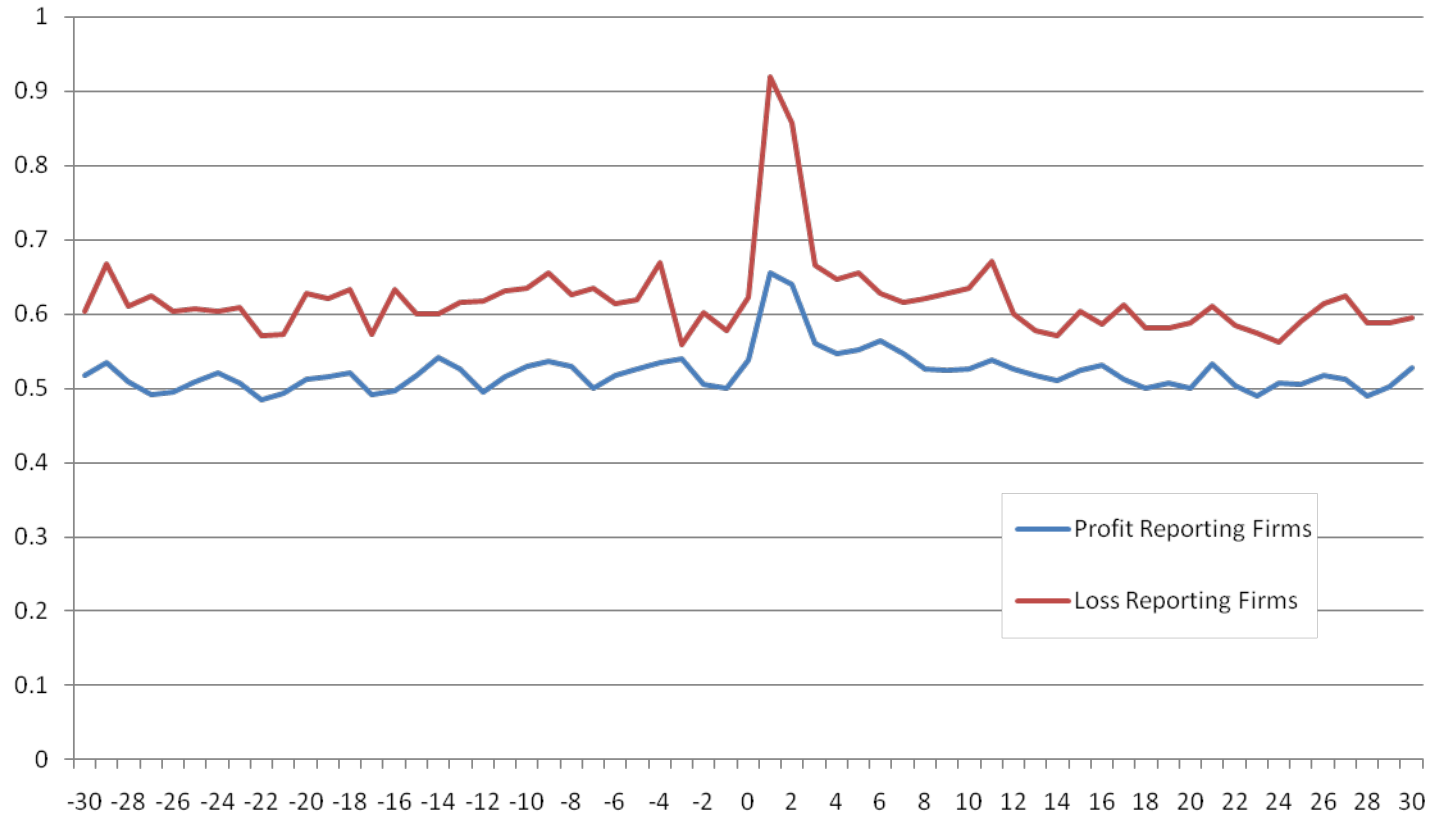


Liquidity risk seems to be as important as liquidity level in explaining the quarterly bond spreads.

The Impact of Accounting Information Releases on Bond Liquidity



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Replication of Easton Monahan and Vasvari (2009)