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# **Corporate Bond Market Transparency and Transaction Costs**

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# Formal Disclaimer

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- This speech expresses my views and does not necessarily reflect those of the Commission, the Commissioners, or other members of the staff.

# U.S. Corporate Bond Market Characteristics

- Many securities.
- Infrequently traded.
- Almost no quotes.
- Very little price transparency.
  - Introduced in phases
  - Reporting lags of several minutes

# Important Issues

- What are secondary transaction costs in the U.S. corporate bond market?
  - Estimate average transaction costs for each bond.
  - Allow transaction cost estimates to vary over different trade sizes.

# Important Issues

- What determines these costs?
  - Identify cross-sectional determinants of these costs.
  - Identify how costs change when corporate bond trades become more transparent.

# The TRACE Sample

- Broker-dealers report all U.S. OTC corporate bond trades to the NASD.
  - Trade Reporting And Compliance Engine
  - Price, time, size, dealer, customer side
  - Our one-year sample period:  
January 2003 – December 2003

# TRACE Sample Selection

(from Table 1)

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	Bonds	Trades	Volume (\$ billion)
Records	68,877	8,668,987	9,413
Final sample	16,746	6,649,758	5,079

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*Deleted:*

- *Missing data*
- *Unknown/inactive securities*
- *Pricing errors*
- *Unidentified cost regressions*

# TRACE Bond Characteristics

(from Table 2)

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	Mean	1 <sup>st</sup> pctl	99 <sup>th</sup> pctl
Trades per day	1.9	<0.1	22
Dollar trade size (\$000)			
Minimum	31	0.4	545
Median	584	5.4	6,806
Maximum	12,401	25.9	105,243

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# TRACE Characteristics

(from Table 3)

## Credit Quality

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	Bonds	Trades	Value traded
Superior AA/AAA	9%	8	8
Other inv. quality	63	63	57
Speculative <BBB	23	26	31
Defaulted	3	2	2
Not Rated	3	1	2

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# Corporate Bond Transparency

- Trades for TRACE-transparent bonds were reported with a 45 minute lag during our sample period.
- Bonds have been made TRACE-transparent based on credit quality and original issue size.
- All NYSE ABS bond trades are transparent.

# TRACE-Transparent Bonds

- Throughout 2003: All bonds rated BBB and above with Original Issue Size > \$1B.
- March 1, 2003: All bonds rated A and above with \$100M > OIS > \$1B.
- April 14, 2003: 120 bonds rated BBB selected by independent economists.

# Transparency During 2003

(from Table 3)

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	Bonds	Trades	Value traded
TRACE (any time)	22%	49	53
ABS-listed	3	5	3
ABS and TRACE	1	2	2
Never transparent	76	48	45

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# Transaction Cost Measurement Methods

# Benchmark Methods

- Most transaction cost measures require price benchmarks.
  - Quotes
  - Daily average price: Warga and others
  - Closing or opening prices

# Econometric Approaches

- The Roll Serial covariance spread estimator.
- Regression methods are useful when we know the side trade initiators (customers) are on.
  - Schultz (2001)
  - Bessembinder, Maxwell, Venkataraman (2005)
  - Goldstein, Hotchkiss, and Sirri (2005)

# Summary of Our Econometric Method

# Price and Value

- $\text{Log Price} = \text{Log Value} \pm \text{trade cost}$
- Let  $Q_t$  indicate with values 1, or -1 whether trade  $t$  was initiated by a customer buyer or seller.
- Set  $Q_t$  to 0 for interdealer trades.
- Specify a cost function that allows costs to vary with size.

# Returns

- Look at log price change between trades  $t$  and  $s$  to produce a regression equation. (The trades need not be in order.)
- Model value returns with drift, common, and idiosyncratic components.

# The Regression Model

$$\begin{aligned} r_{ts}^P - Days_{ts} (5\% - CouponRate) = & \\ & c_0 (Q_t - Q_s) + c_1 \left( Q_t \frac{1}{S_t} - Q_s \frac{1}{S_s} \right) + c_2 (Q_t \log S_t - Q_s \log S_s) \\ & + c_3 (Q_t S_t - Q_s S_s) + c_4 (Q_t S_t^2 - Q_s S_s^2) \\ & + \beta_1 AveIndexRet_{ts} + \beta_2 DurationDif_{ts} + \beta_3 CreditDif_{ts} + \eta_{ts} \end{aligned}$$

# Estimation Strategy

- Estimate the model without the indices for each bond.
- Adjust prices to remove trade costs and use repeat sales methods to compute the indices.
- Re-estimate the model with the indices.

# Cost Estimates

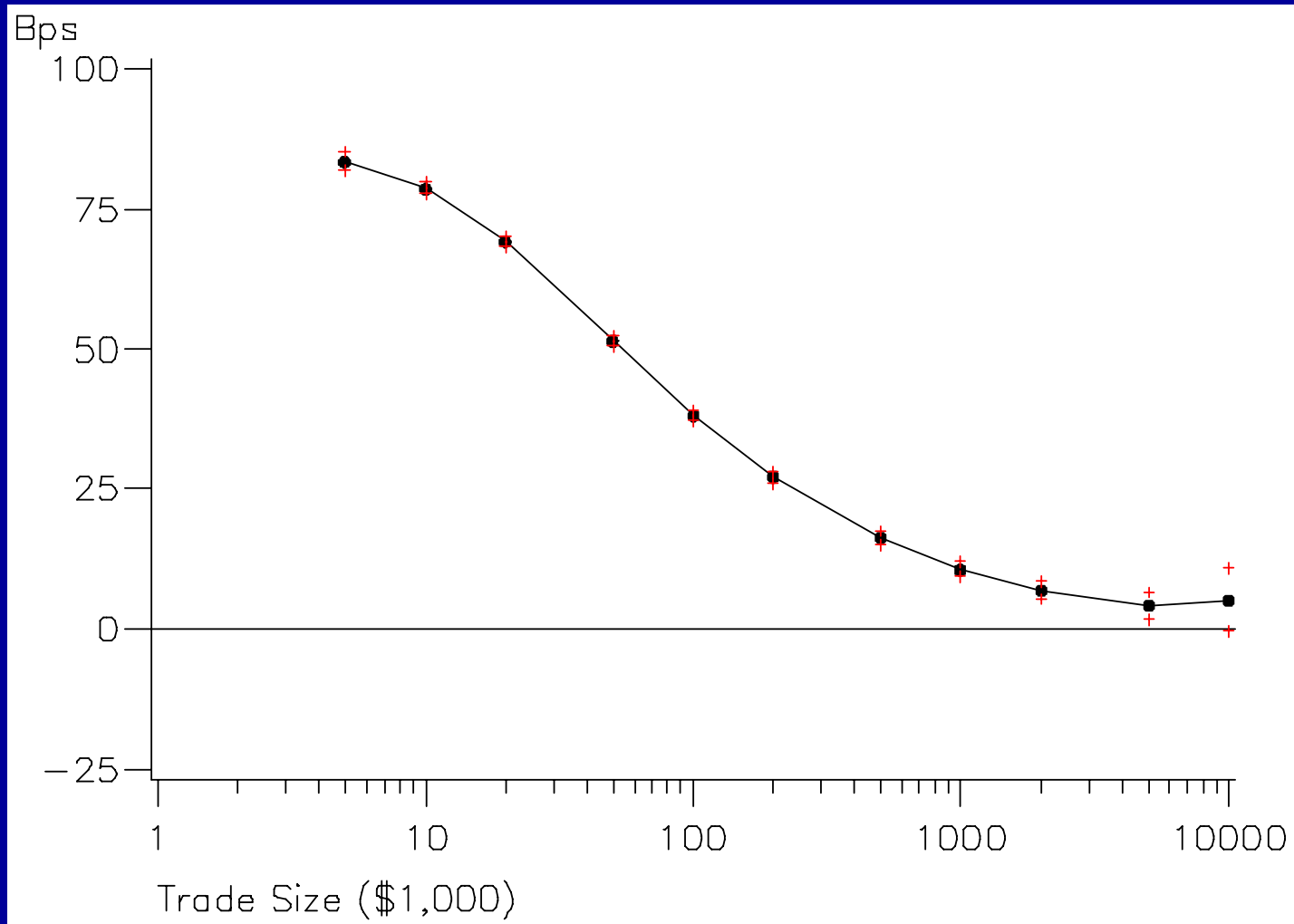
- Estimated cost for a given trade size for a given bond is

$$\hat{c}(S) = \hat{c}_0 + \hat{c}_1 \frac{1}{S} + \hat{c}_2 \log S + \hat{c}_3 S + \hat{c}_4 S^2$$

- Means across bonds are weighted by the inverse of the estimator error variance.

# Results

# Mean Estimated Corporate Transaction Costs (Figure 1)



# Cross-sectional Regressions

- Dependent variable:
  - Average bond transaction cost estimate for a specific representative trade size.
- Regressors:
  - Inverse Price
  - Credit Rating Index
  - Complexity Features
  - Age/Maturity Features
  - Size/Scale Features
  - Transparency
- Estimate the models with WLS.

# **Cross-Sectional Regression Results**

**From Table 5, \$100,000 Trade Size**

# Credit Rating Coefficients

(in bps)

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Regressor	Estimate	t-stat
Rating is BBB	4	7
Rating is B or BB	6	7
Rating is C and below	10	7
Bond is in default	8	2

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# Transparency Coefficients (in bps)

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Regressor	Estimate	t-stat
TRACE-transparent (fraction of trades reported to public during 2003)	-3.8	-4.8
Traded on NYSE ABS	-3.5	-3.4

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# **Time-series Analysis of Transparency**

# Transparency Changes

- All 3,004 bonds rated A and up with \$100M < Original Issue Size < \$1B became TRACE-transparent on March 1, 2003.
- A size-stratified sample of 120 intermediate sized BBB rated bonds became transparent on April 14.
- What happened to costs?

# March 1 Samples (from Table 6)

	Target	Comparison Samples		
		C1	C2	C3
Original issue size	>\$100M &<1B	>\$1B	<\$100M	>\$100M &<1B
Rating	A & up	A & up	A & up	BBB
Transparent	March 1	Always	Never	Never
Bonds	3,004	814	8,952	4,065
Trades (thousands)	952	1,516	1,014	1,219

# Difference of Differences Comparison Method

- On each day, compute difference in costs between the March 1 sample and the three control samples.
- Compare the average cost differences before and after March 1.

# Results for \$100K Trade Size

(from Table 6)

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Comparison	Difference of differences	t-stat
T minus C1	-10	-9
T minus C2	-11	-9
T minus C3	-14	-12
C1 minus C2	-1	-1.5
C2 minus C3	-3	-4

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# More Results

- Similar, but smaller, results for the 120 BBB bonds made transparent on April 14 (Table 7).
  - 5 and -7 bps versus two comparison samples, both statistically significant.

# Conclusions

- Secondary transaction costs in corporate bonds decrease with trade size.
- Price transparency lowers transaction costs.
- Studies such as this one are essential inputs into the regulatory process.

# Recent Developments

- As of February 7, 2005, trades in >29,000 corporate bonds (about 99% of all trades) are available for dissemination within 30 minutes.
- Starting January 31, 2005, all trades in municipal bonds are available with a 15-minute lag.