Bid-Ask Spreads and the Pricing of Securitizations: 144a vs. Registered Securitizations

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Securitization Trading: Historically Opaque Markets

- FINRA began to *collect* transaction-level data from broker-dealers on May 16th, 2011:
  - ABS, CDOs (CDO,CBO,CLO), CMBS, CMOs, MBS, TBA.
  - **We study**: ABS, CDOs, CMBS, n-a CMOs.

- Limited public *dissemination* began on October 18th, 2011
  - daily disclosure of price index,
  - aggregation within collateral types and days,
  - plus initial disclosure of five months.

- Earlier transparency initiatives: TRACE (corporate bonds), MSRB (municipal bonds).

Securitization Trading: Focus of Our Study

- **Descriptive facts** about the markets.

- **Transaction costs for customers**: bid-ask spreads, dealer networks architecture, limited increase in transparency, retail/institutional.

- **Dealer Networks**:
  - centralized/peripheral dealers, network analysis,
  - **feedback into spreads:** dealers' search efficiencies.

- **Registered/Rule 144a** securitizations:
  - Exempt QIBs from disclosure requirements,
  - Rule 144a held by sophisticated investors,
  - **Feedback into spreads**: bargaining power, limited market, adverse selection.

Trading Activity: Our Sample

- ## Dealer-to-customer and inter-dealer trades in Registered & Rule 144a securitizations
  - Between May 16th 2011 and February 29, 2012
  - ABS, CDOs, CMBS, non-agency CMOs (incl. R144a)
  - Price, Volume, factors + ratings data (Moody's)
  - Dealer identities are masked

- ## Pre-Release: **May 16th 2011** to **Oct. 17th 2011**
- ## Post-Release: **Oct. 18th 2011** to **Feb. 29th 2012**
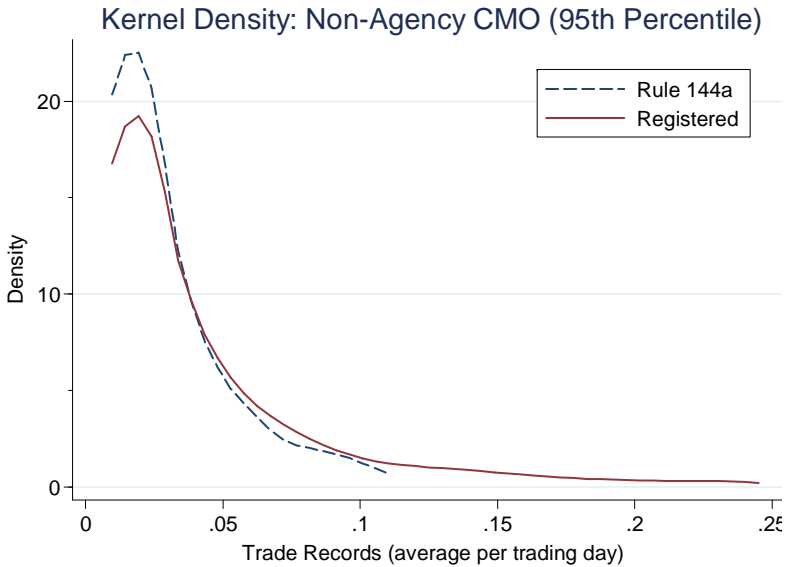
Figure 2b:
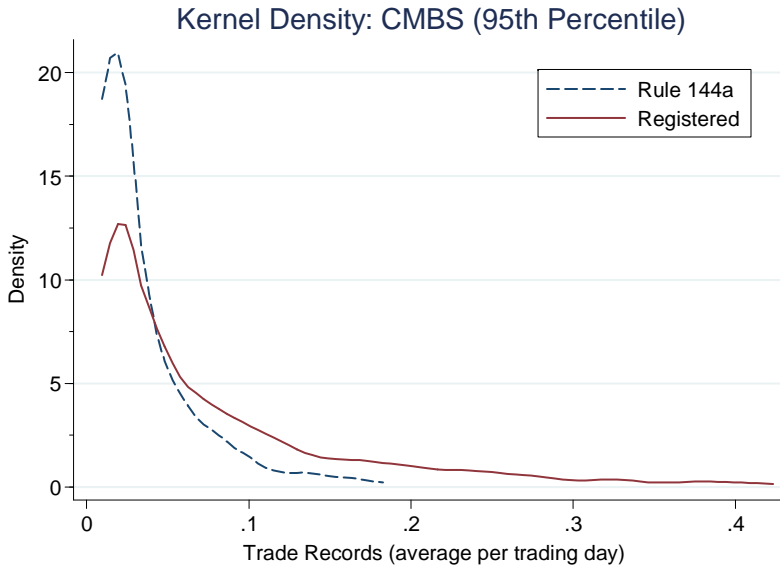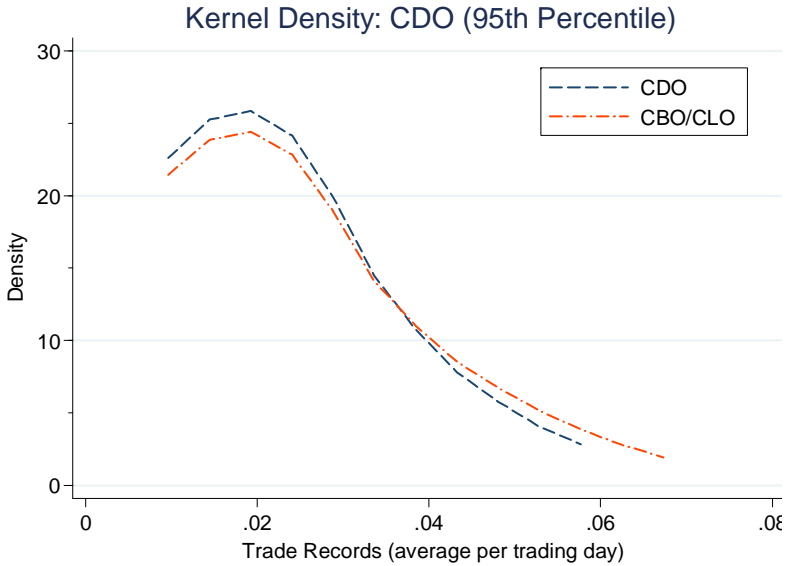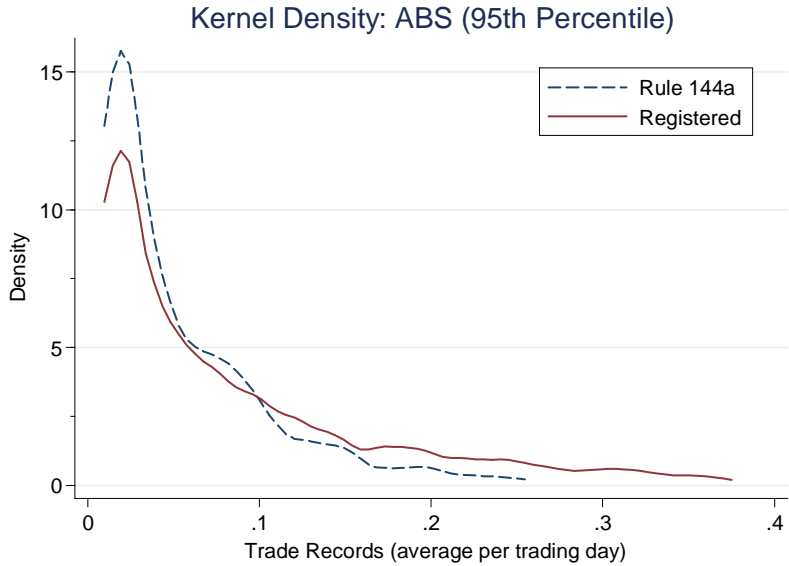

CDO CBO Rule 144a Inv. Grade
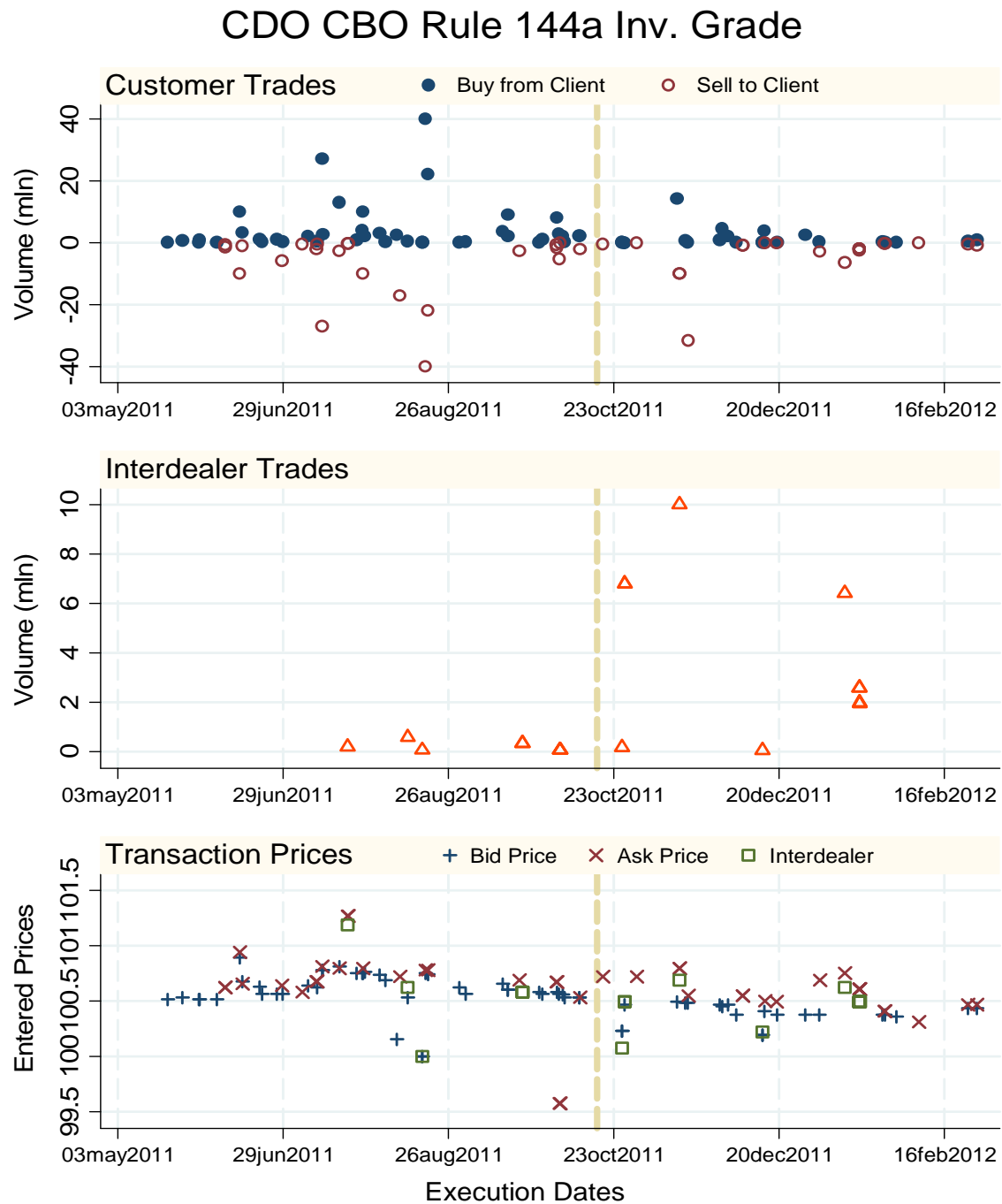
Table 1: Number of Instruments

- *Except for non-agency CMOs Rule 144a instruments dominate,*
- *However Registered instruments are much more likely to trade.*

Category:	ABS Overall	CDOs Overall	CMBS Overall	CMO Overall
Population	12,661	7,543	13,720	78,350
Registered	4,567	55	5,765	61,687
Rule 144a	8,094	7,488	7,955	16,663
Traded Pre-Release	1,994	731	2,096	8,819
Registered	1,425	23	1,488	8,203
Rule 144a	569	708	608	616
Traded Post-Release	1,989	718	2,086	8,461
Registered	1,359	24	1,489	7,815
Rule 144a	630	694	597	646
Traded Overall	2,807	1,251	2,967	13,396
Registered	1,905	29	1,997	12,355
Rule 144a	902	1,222	970	1,041

Figure 1: Trading Records Per Day

Kernel Density: ABS (95th Percentile)

Kernel Density: CDO (95th Percentile)

Kernel Density: CMBS (95th Percentile)

Kernel Density: Non-Agency CMO (95th Percentile)

Figure 3: Distribution of Moody's Ratings

- *Both AAA and C rated instruments are present in our sample,*
- *Ratings were remarkably stable during our sample period.*
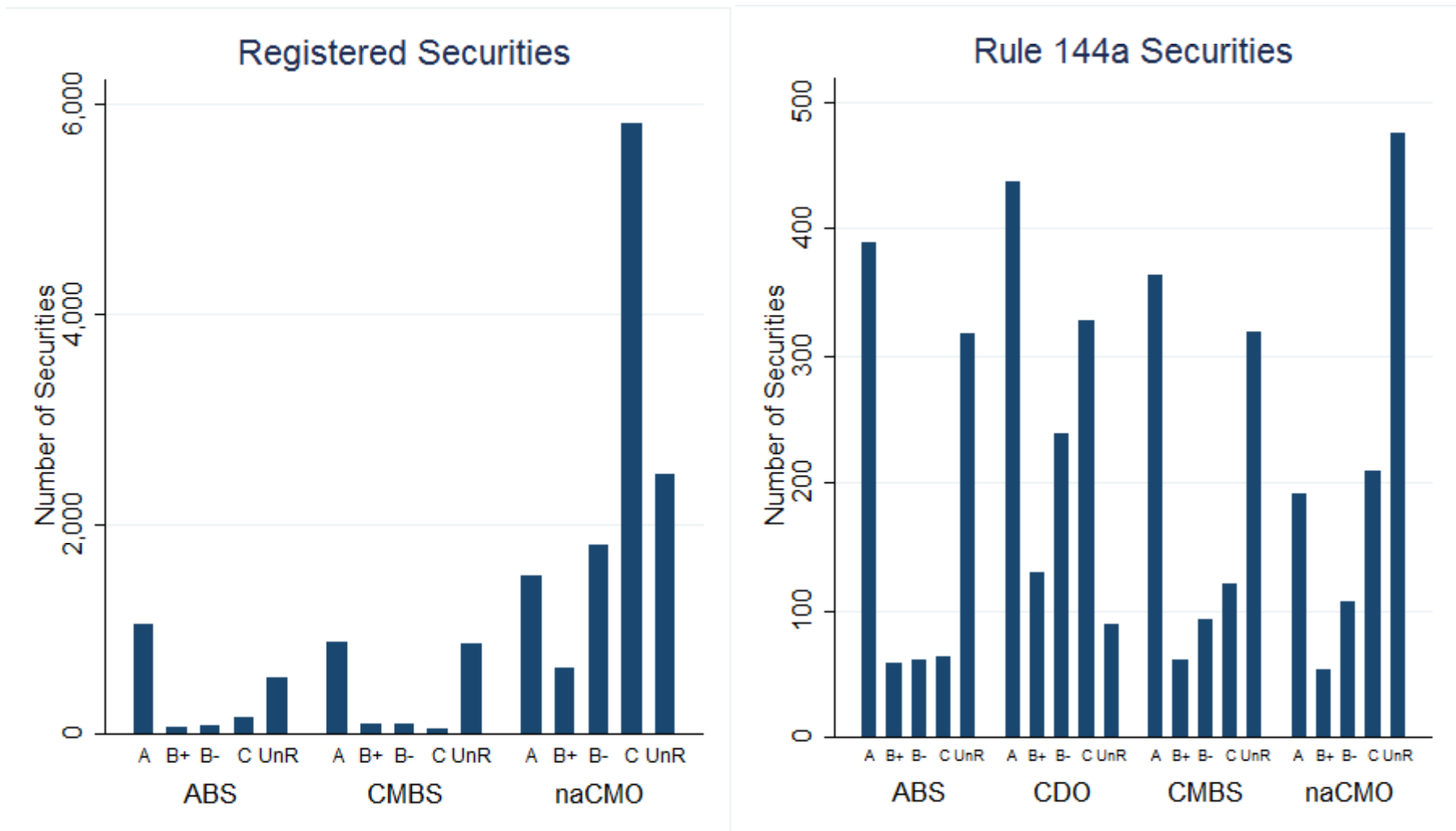
Securitization Trading: Descriptive Facts

- **Population of Securitizations:**
  - Except for non-agency CMOs Rule 144a instruments dominate,
  - Around 20% of instruments have customer trades in our sample.

- **Trading Frequencies:**
  - On average ABS instruments have 0.097 trades per day (0.117 Registered and 0.074 Rule 144a),
  - The cross-sectional distribution of trades is highly skewed,
    => conceptual difficulty in estimating bid-ask spreads.

- **Trade Sizes:**
  - Retail activity constitutes smallest fraction of trades (and very rare in Rule 144a, stands for order splitting). Most retail trades are observed in CMOs.
  - There is sufficient variation in trade sizes for our bid-ask spread analysis.

- **Number of Active Dealers:**
  - On average more dealers are active in trading Registered instruments than Rule 144a instruments.

How Large are Bid-Ask Spreads

- How often do the instruments trade?
- Do the spreads vary with instrument type?
  - Collateral type
  - Credit quality
  - Registration status
- Retail vs. institutional?
- How does dealers' position in the interdealer network influence customer spreads?
- How might transparency modify the spreads?

Figure 5: Non-Retail Client Bid-Ask Spreads
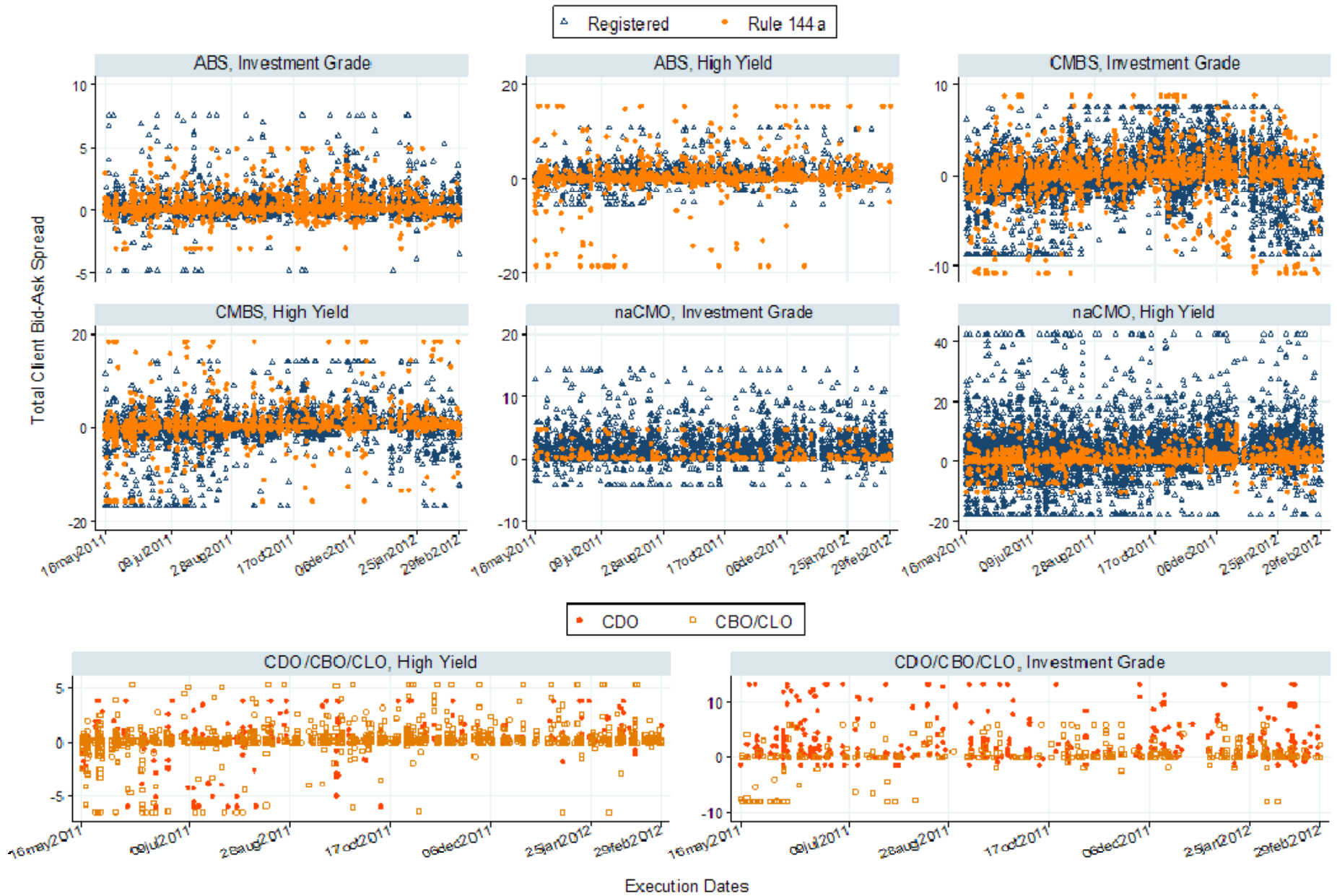
Table 5: Mean Spreads by Size (Reg. and Rule 144a)

Category:	Investment Grade				High-Yield			
	ABS	**CDOs**	**CMBS**	**CMOs**	**ABS**	**CDOs**	**CMBS**	**CMOs**
Overall	**0.378**	**0.397**	**0.271**	**2.871**	**0.846**	**1.512**	**0.746**	**3.463**
	(0.009)	(0.036)	(0.012)	(0.027)	(0.029)	(0.128)	(0.028)	(0.018)
Retail	1.400	1.197	1.023	3.828	2.066	3.711	2.868	4.333
	(0.056)	(0.614)	(0.049)	(0.034)	(0.075)	(1.482)	(0.113)	(0.021)
	1763	11	1651	6896	901	15	1099	33432
Non-Retail	0.233	0.390	0.163	1.566	0.546	1.472	0.389	2.180
	(0.006)	(0.036)	(0.011)	(0.036)	(0.029)	(0.127)	(0.023)	(0.029)
	12475	1278	11446	5052	3660	814	6532	22667
Difference	F = 433	F=2	F=294	F=2121	F=361	F=2.4	F=459	F=3541
	(p=0.000)	(p=0.169)	(p=0.000)	(p=0.000)	(p=0.000)	(p=0.120)	(p=0.000)	(p=0.000)

– *Bid-Ask spreads on retail-sized trades are significantly larger,*
– *Spreads on High-yield instruments are significantly larger.*
– *Spread distributions are skewed to the right (medians are lower)*

Customer Bid-Ask Spreads

- **Low Trading Frequencies:**
  - => we rely on multistep matching method

- **Registration status:**
  - Rule 144a instruments tend to have tighter bid-ask spreads,
  - Smaller pool of potential owners, more sophisticated players.

- **Credit Quality:**
  - For the majority of instrument types, high-yield instruments have larger bid-ask spreads on average.

- **Comparison to Corporate Bonds:**
  - Except CMOs, spreads are comparable to spreads on corporate bonds after the introduction of TRACE (Goldstein, Hotchkiss, and Sirri (2007)).
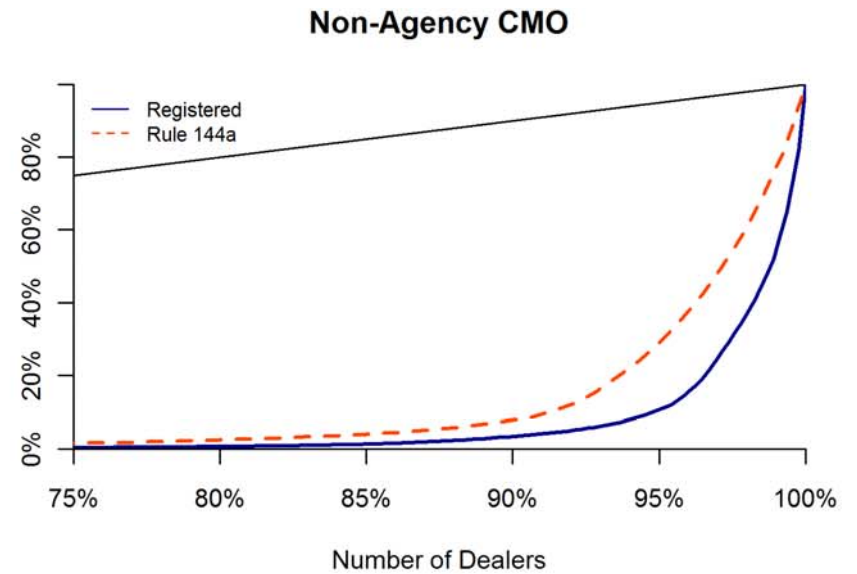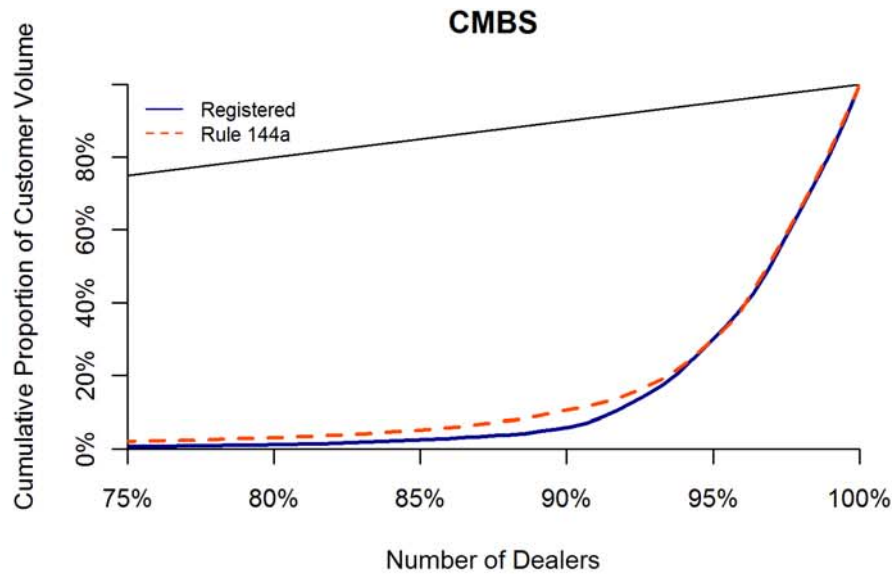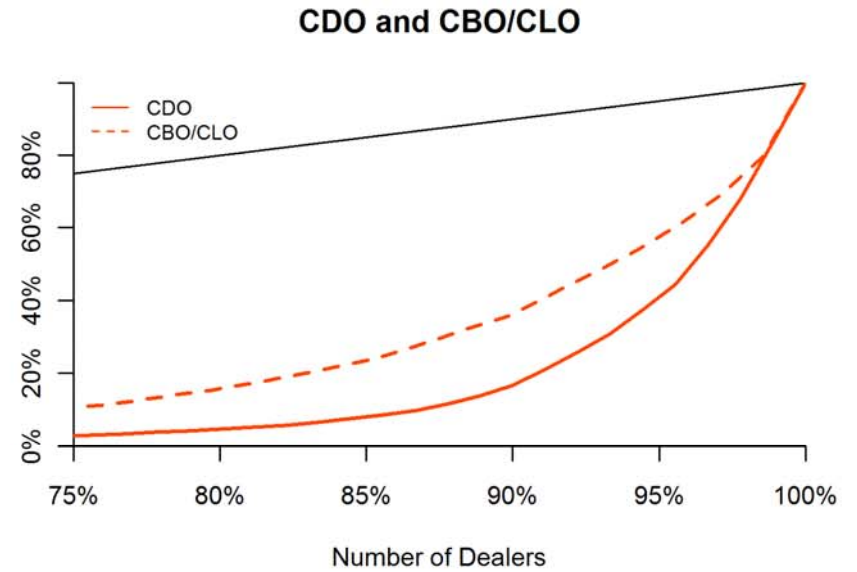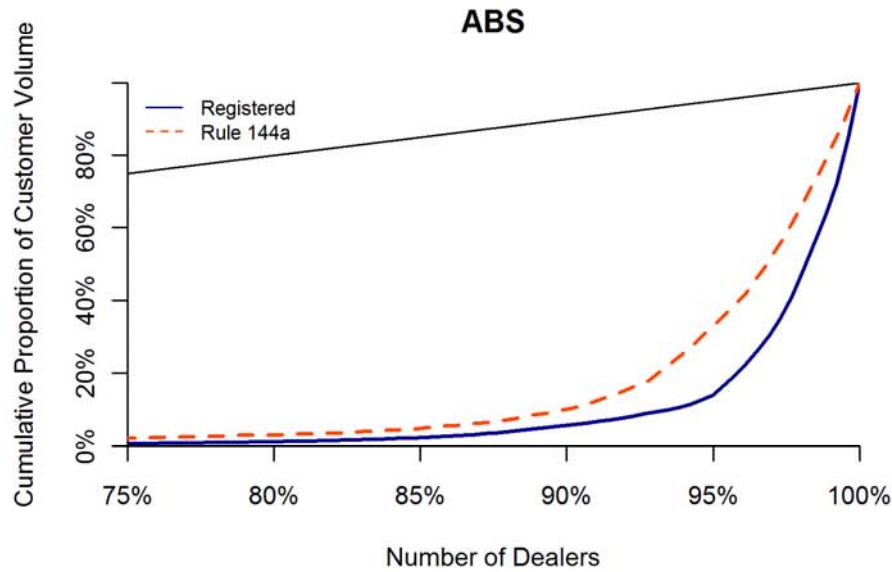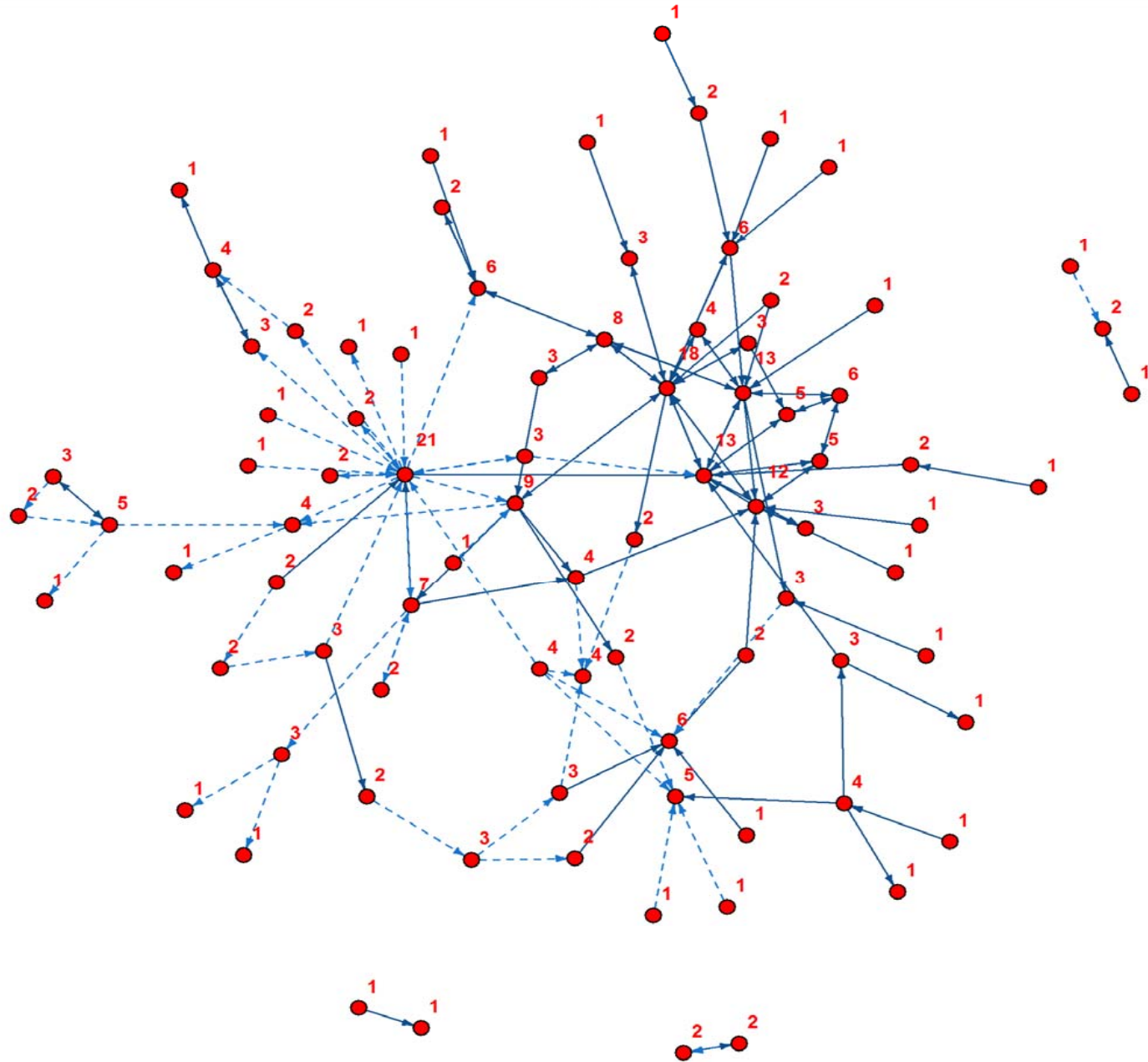
Figure 6: Lorenz Curves by Market

Figure 8: The Topology of the Interdealer Market

Securitization Trading: Dealer Networks

- **Dealer Network Topology:**
  - We document core-peripheral structure (similar to Li and Schürhoff 2012)
  - Median dealer: 10 trades, $5MM; 75th%-dealer: 57 trades, $102MM

- **Dealer's Centrality and Spreads:**
  - Positive relationship in municipal bonds market (Li and Schürhoff 2012)
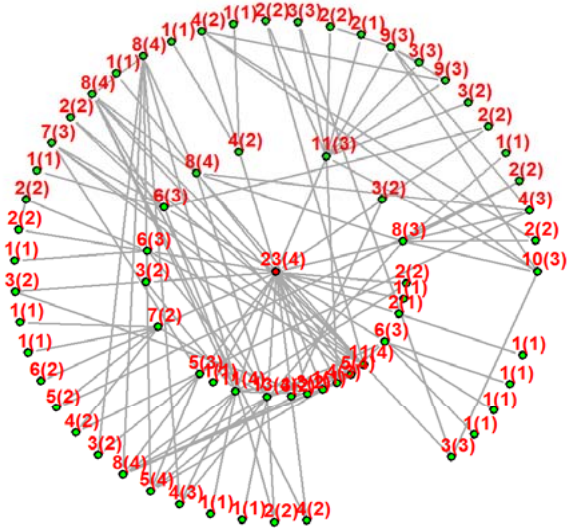 - We document negative relationship for ABS, CMBS and Rule 144a CMOs

  Theoretical Arguments:
  - Competition among centralized dealers and market segmentation,
  - Lower bargaining power of central dealers,
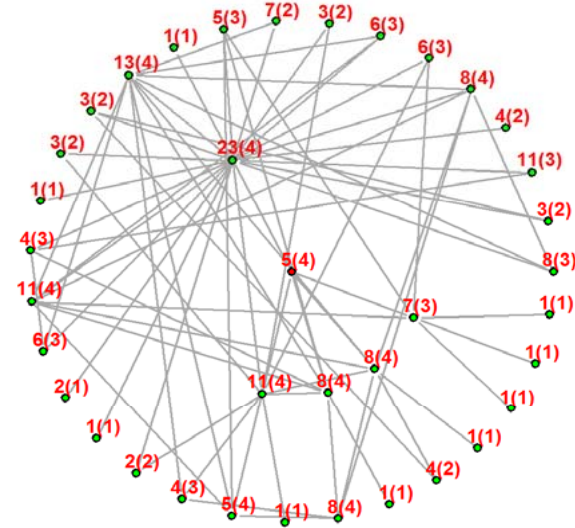 - Search efficiency and customer shopping activity (Neklyudov 2012)

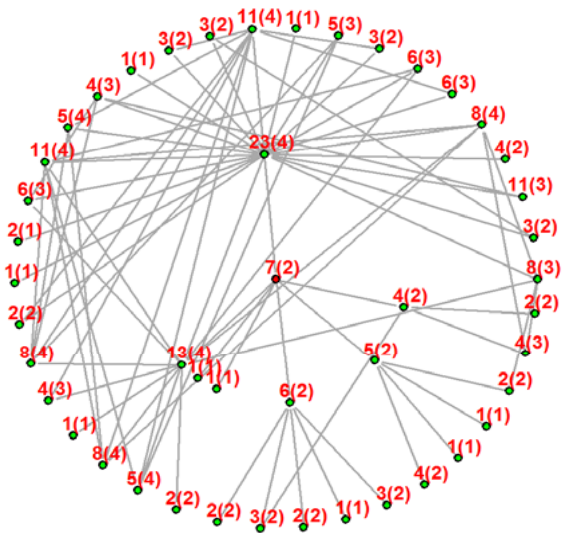# Figure 9: Dealers' Coreness and Degree Centrality

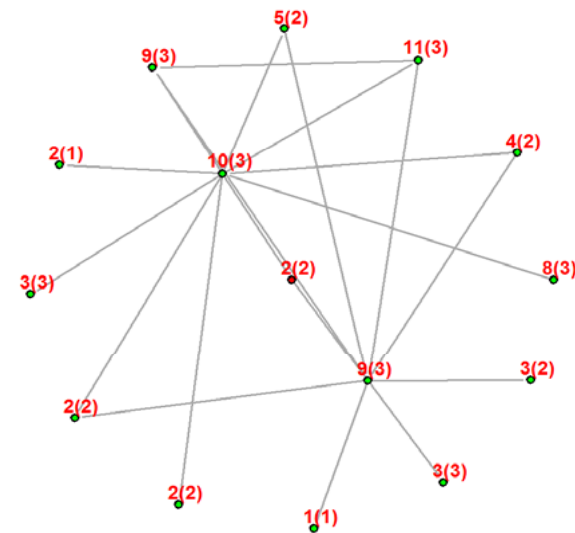# Figure 12a: Dealer Bid-Ask Spreads and Degree-Coreness
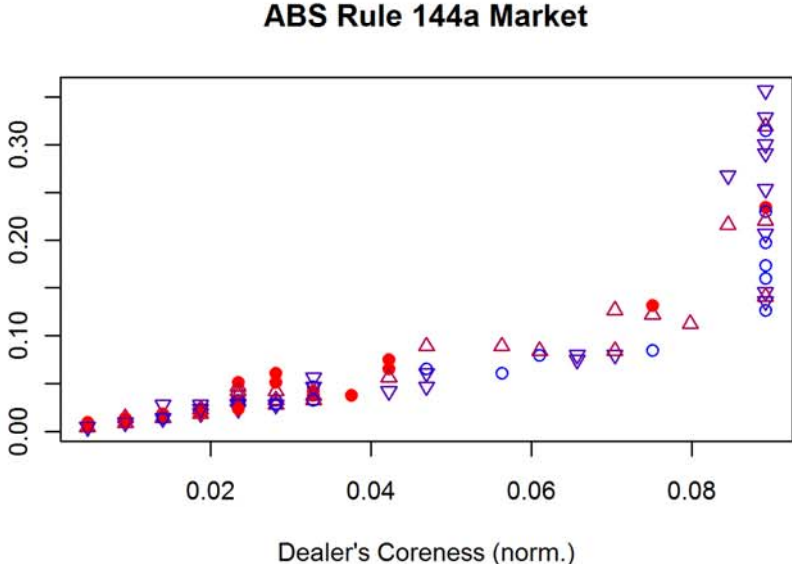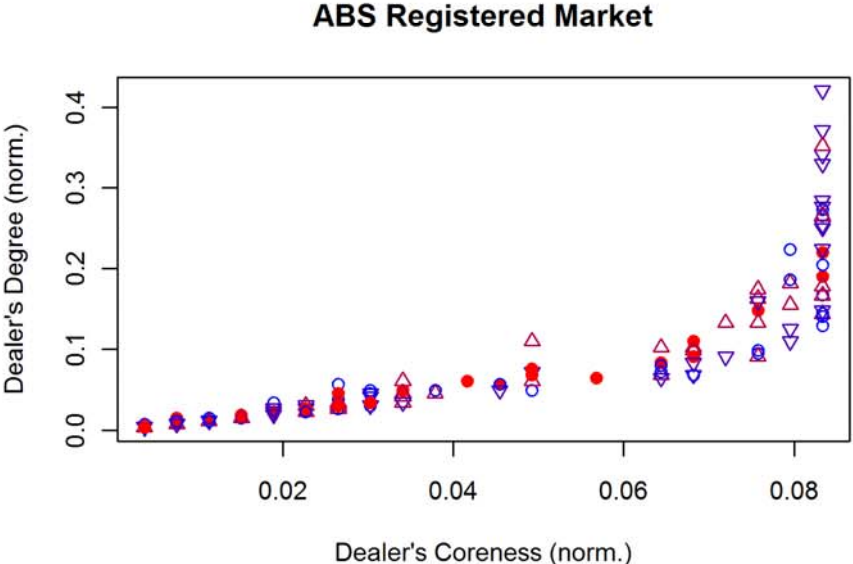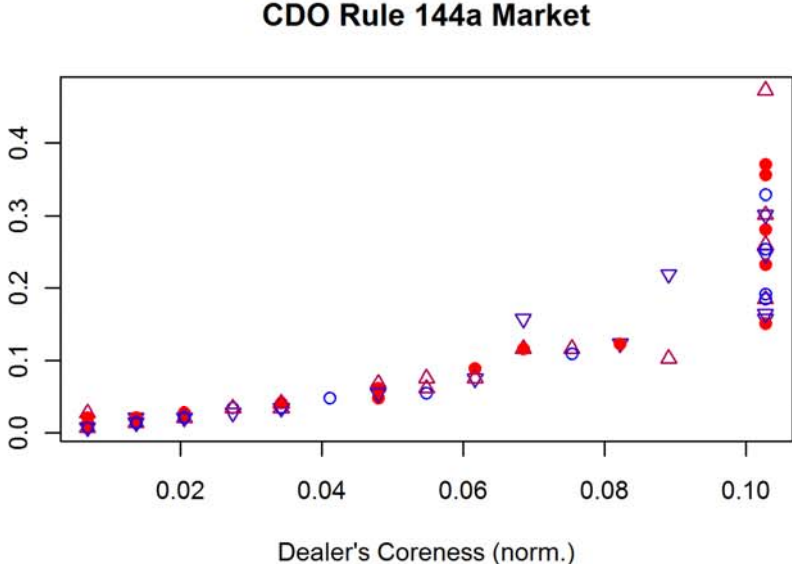
Figure 12b: Dealer Bid-Ask Spreads and Degree-Coreness
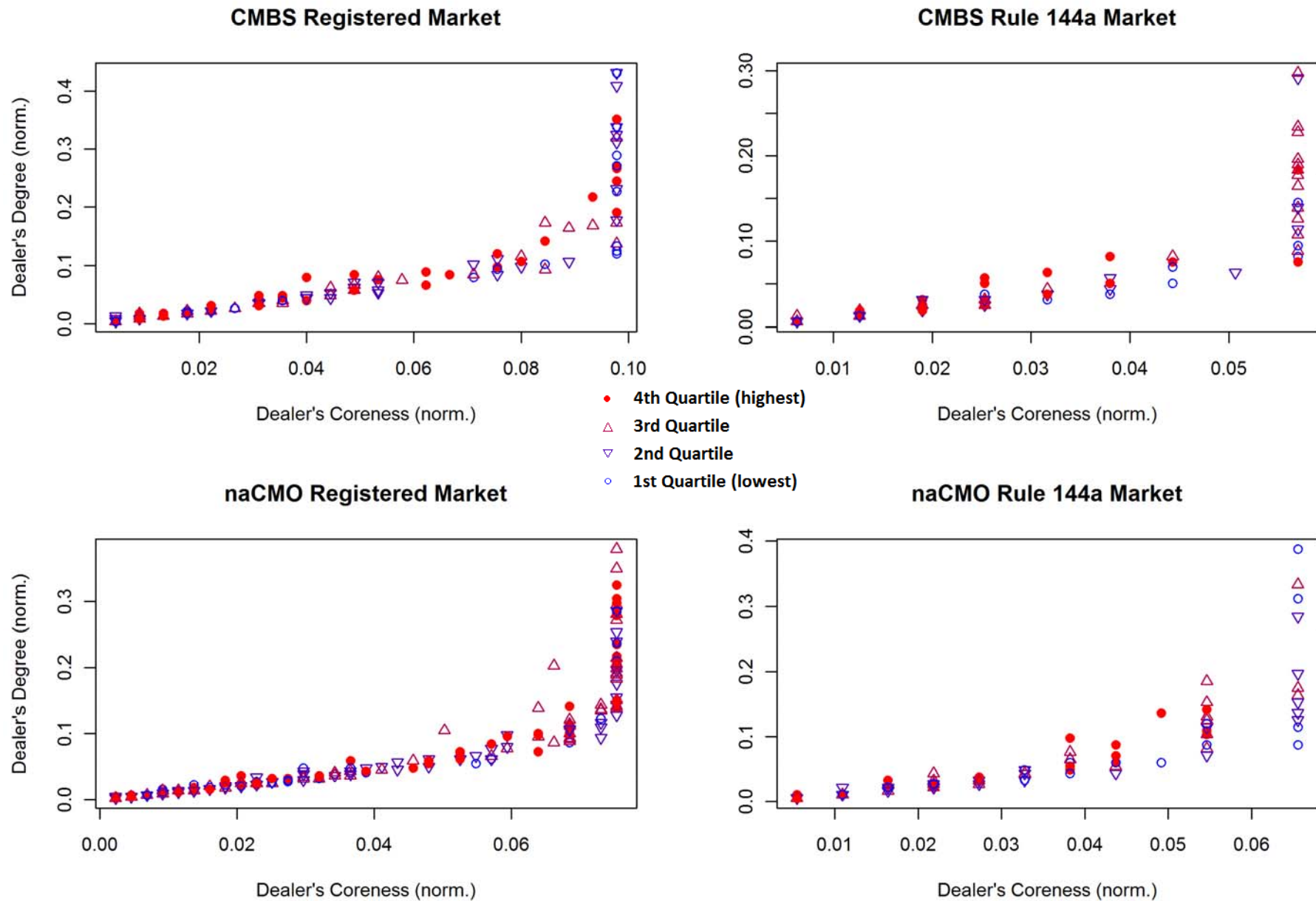
Table 10a: Regression for Non-Retail Total Client Spreads

Categories:	ABS				CDOs	
Variables:	**Overall**	*Reg.*	*R144a*	*Slopes Eq.*	**CDO**	**CBO/CLO**
Security Specific Match Volume	**-0.138** (0.022)	-0.132 (0.022)	-0.191 (0.046)	F = 1.31 p = 0.252	-0.472 (0.179)	-0.103 (0.067)
Deviation of Particular Match	**-0.052** (0.009)	-0.052 (0.009)	-0.059 (0.019)	F = 0.13 p = 0.722	0.004 (0.234)	0.007 (0.088)
Number of Trades in Sample	**-0.077** (0.018)	-0.038 (0.016)	-0.135 (0.046)	F = 3.88 p = 0.049	-0.379 (0.276)	-0.113 (0.084)
Gap in Execution Time	**0.002** (0.002)	0.002 (0.002)	-0.002 (0.005)	F = 0.71 p = 0.398	-0.007 (0.057)	-0.041 (0.025)
Number of Dealers	**0.003** (0.002)	-0.004 (0.002)	0.014 (0.009)	F = 4.19 p = 0.041	0.019 (0.080)	0.025 (0.043)
Proportion of Interdealer Trades	**0.131** (0.070)	0.163 (0.091)	0.079 (0.144)	F = 0.24 p = 0.621	-0.483 (0.979)	-0.181 (0.403)
Dealers Importance Dummy	**-0.275** (0.040)	-0.214 (0.038)	-0.399 (0.105)	F = 2.72 p = 0.099	0.216 (0.352)	-0.731 (0.173)
Number of Rounds in the Deal	**0.163** (0.016)	0.174 (0.019)	0.150 (0.028)	F = 0.48 p = 0.491	0.931 (0.358)	0.087 (0.192)

Table 10b: Regression for Non-Retail Total Client Spreads

Categories:	CMBS				Non-Agency CMO			
Variables:	**Overall**	*Reg.*	*R144a*	*Slopes Eq.*	**Overall**	*Reg.*	*R144a*	*Slopes Eq.*
Security Specific	**-0.055**	-0.039	0.058	F = 0.96	**-0.477**	-0.833	-0.074	F = 73.83
Match Volume	(0.037)	(0.029)	(0.095)	p = 0.327	(0.035)	(0.044)	(0.076)	p = 0.000
Deviation of	**-0.109**	-0.117	-0.048	F = 2.15	**-0.354**	-0.474	-0.442	F = 0.06
Particular Match	(0.014)	(0.014)	(0.045)	p = 0.143	(0.050)	(0.056)	(0.113)	p = 0.804
Number of	**-0.137**	-0.092	-0.207	F = 2.13	**0.119**	0.012	-0.032	F = 0.42
Trades in Sample	(0.027)	(0.022)	(0.076)	p = 0.144	(0.026)	(0.028)	(0.062)	p = 0.516
Gap in	**-0.010**	-0.009	-0.006	F = 0.07	**0.075**	0.082	0.015	F = 8.04
Execution Time	(0.003)	(0.003)	(0.012)	p = 0.797	(0.012)	(0.013)	(0.020)	p = 0.005
Number of	**-0.002**	-0.004	0.003	F = 0.16	**-0.092**	-0.087	-0.022	F = 17.00
Dealers	(0.005)	(0.004)	(0.016)	p = 0.686	(0.007)	(0.008)	(0.014)	p = 0.000
Proportion of	**-0.161**	-0.377	1.392	F = 7.57	**0.853**	0.554	0.492	F = 0.02
Interdealer Trades	(0.097)	(0.080)	(0.638)	p = 0.006	(0.216)	(0.228)	(0.360)	p = 0.884
Dealers Average	**-0.506**	-0.431	-0.616	F = 0.78	**-0.114**	0.035	-0.481	F = 12.61
Importance	(0.063)	(0.047)	(0.203)	p = 0.376	(0.061)	(0.065)	(0.130)	p = 0.000
Number of Rounds	**0.071**	0.056	0.418	F = 9.66	**1.264**	1.262	0.670	F = 25.64
in the Deal	(0.015)	(0.014)	(0.116)	p = 0.002	(0.059)	(0.063)	(0.099)	p = 0.000

– Similar to other fixed-income markets: **volume discount** (municipal bonds: Green, Hollifield, and Schürhoff 2007, Harris and Piwowar 2006; corporate bonds: Bessembinder, Maxwell, and Venkataraman (2006), Edwards, Harris, and Piwowar (2007), and Goldstein, Hotchkiss, and Sirri (2007)

Table 12a: Regression for Non-Retail Dealer Spreads

Categories:	ABS				CDOs	
Variables:	**Overall**	*Reg.*	*R144a*	*Slopes Eq.*	**CDO**	**CBO/CLO**
Security Specific Match Volume	**-0.115** (0.015)	-0.119 (0.014)	-0.134 (0.034)	F = 0.17 p = 0.679	-0.353 (0.149)	-0.118 (0.046)
Deviation of Particular Match	**-0.037** (0.006)	-0.044 (0.006)	-0.017 (0.015)	F = 2.88 p = 0.089	0.164 (0.213)	0.062 (0.066)
Number of Trades in Sample	**-0.065** (0.012)	-0.023 (0.011)	-0.152 (0.031)	F = 15.00 p = 0.000	-0.728 (0.233)	-0.125 (0.056)
Gap in Execution Time	**0.006** (0.002)	0.004 (0.002)	0.012 (0.005)	F = 1.95 p = 0.162	0.042 (0.063)	0.009 (0.016)
Number of Dealers	**0.002** (0.002)	-0.005 (0.002)	0.016 (0.005)	F = 14.53 p = 0.000	0.066 (0.068)	-0.009 (0.023)
Proportion of Interdealer Trades	**0.145** (0.043)	-0.009 (0.047)	0.348 (0.100)	F = 10.41 p = 0.001	1.683 (1.009)	0.243 (0.205)
Dealers Coreness	**-0.052** (0.011)	-0.040 (0.011)	-0.075 (0.029)	F = 1.28 p = 0.258	0.278 (0.137)	-0.117 (0.050)
Dealers Degree Residual	**-0.034** (0.007)	-0.028 (0.007)	-0.045 (0.019)	F = 0.68 p = 0.410	-0.488 (0.141)	-0.041 (0.035)

Table 12b: Regression for Non-Retail Dealer Spreads

Categories:	CMBS				Non-Agency CMO			
Variables:	**Overall**	*Reg.*	*R144a*	*Slopes Eq.*	**Overall**	*Reg.*	*R144a*	*Slopes Eq.*
Security Specific	**-0.004**	0.020	0.024	F = 0.00	**-0.333**	-0.533	-0.069	F = 44.85
Match Volume	(0.026)	(0.019)	(0.070)	p = 0.951	(0.020)	(0.024)	(0.065)	p = 0.000
Deviation of	**-0.103**	-0.098	-0.097	F = 0.00	**-0.356**	-0.438	-0.280	F = 3.69
Particular Match	(0.011)	(0.010)	(0.042)	p = 0.979	(0.027)	(0.029)	(0.077)	p = 0.055
Number of	**-0.129**	-0.096	-0.169	F = 1.17	**0.150**	0.085	-0.102	F = 10.55
Trades in Sample	(0.020)	(0.016)	(0.066)	p = 0.280	(0.014)	(0.015)	(0.056)	p = 0.001
Gap in	**-0.004**	-0.004	-0.001	F = 0.08	**0.106**	0.113	0.067	F = 4.68
Execution Time	(0.003)	(0.003)	(0.010)	p = 0.782	(0.008)	(0.009)	(0.020)	p = 0.031
Number of	**-0.002**	-0.001	-0.006	F = 0.12	**-0.062**	-0.058	-0.007	F = 12.88
Dealers	(0.004)	(0.003)	(0.013)	p = 0.730	(0.003)	(0.003)	(0.014)	p = 0.000
Proportion of	**0.143**	-0.052	1.355	F = 12.32	**0.653**	0.504	0.404	F = 0.12
Interdealer Trades	(0.056)	(0.047)	(0.398)	p = 0.000	(0.080)	(0.084)	(0.273)	p = 0.726
Dealers	**-0.052**	-0.027	-0.102	F = 2.25	**0.146**	0.150	0.063	F = 2.36
Coreness	(0.015)	(0.010)	(0.049)	p = 0.134	(0.021)	(0.022)	(0.052)	p = 0.125
Dealers Degree	**-0.004**	-0.021	0.057	F = 3.08	**-0.004**	0.039	-0.332	F = 50.69
Residual	(0.011)	(0.009)	(0.043)	p = 0.079	(0.021)	(0.023)	(0.047)	p = 0.000

– *Coreness and degree residual have different relative importance for ABS, CMBS and non-agency CMOs.*

Concluding Remarks

- **Securitization Trading:**
  - Fragmented and highly illiquid in particular instruments,
  - Wide bid-ask spreads in general, especially on retail trades,
  - Volume discount similar to other fixed-income markets.

- **Dealer Networks:**
  - Highly heterogeneous dealers, fragmented interdealer market,
  - Spreads tend to tighten when trading with a more central dealer

- **Transparency Problems:**
  - Index-level transparency is not associated with tighter spreads,
  - Selection effects are important, aggregation of information is difficult.