ŁŁŁOnline Appendix

In this appendix we provide more details on our computation of the measure of spread that we use in the baseline regressions.

There are several cases. First, consider the case in which the first order for a specific CUSIP by a dealer is a buy order. The buy price is then the price of that first order. As the dealer buys more of the bond at different prices, the buy price changes to an average, weighted by the number of bonds at each price (if some bonds are sold before a new buy order comes in, then the weight on the old price is the number of bonds remaining in the dealer's inventory). We use the same logic to calculate the buy time. The hold time is simply sell time minus the last calculated weighted buy time, as long as the dealer still holds some of the bonds after the sale.

If the first order for a specific CUSIP by a dealer is a sell order, then we compute the weighted sell price and the hold time following the same logic as above. The sell time is calculated in the same way too.

Second, consider the case in which the dealer reaches a balance of 0 shares for a specific CUSIP at some later point. The buy price is then the price of the first order after the 0 balance is reached. As the dealer buys more of the bond at different prices, the buy price changes to an average, weighted by the number of bonds at each price (if bonds are sold before a new buy order, then the weight on the old price is the number of bonds remaining). We use the same logic to calculate the buy time. The hold time is just the sell time minus the last calculated weighted buy time, as long as the dealer still holds some of the bonds after the sale (they don't sell more than they own). Similarly for a sell order.

Lastly, consider the case in which the dealer starts with a negative balance for a specific CUSIP, but with a single order buys more than the negative balance and ends up with a positive holding. The buy price is then the price of the order that shifted the balance from negative to positive. As the dealer buys more of the bond at different prices, the buy price changes to an average, weighted by the number of bonds at each price (if some bonds are sold before a new buy order comes in, then the weight on the old price is the number of bonds still held). We use the same logic to calculate the buy time. The hold time is just the sell time minus the last calculated weighted buy time. We no longer restrict the calculation according to the balance after the transaction. Similarly, if the

dealer starts with a positive balance but in a single order sells more than that amount to end up with a negative balance, we can calculate the (weighted) sell price and sell time. The hold time is just the buy time minus the last calculated weighted sell time.

Table A.0
Additional Summary Statistics

The table reports additional descriptive statistics for the main variables employed in our analysis. In the Panel A, we present the main bond characteristics: the bonds' credit quality, issue size, age and maturity, as provided by a confidential version of TRACE for the period 2005-2011 for the three different samples. The first set report the statistics for the full data sample. The remaining two sets of rows report the summary statistics for the main estimation sample which restricts attention to buy and sell transactions observed within an hour from each other, and for the sample used in the robustness checks in the appendix. Panel B provides summary statistics for these characteristics and for the transactions, such as the profit margins, the volume, the holding period and the seller's centrality measure.

Panel A

Full Sample	Mean	P1	Median	P99	Std Dev
By Bonds					
Rating	BBB+	D	A-	AAA	
Size	$21.0 M	$400	$2.5 M	$798 M	$41.2 M
Age	2.9	0	1.9	78.5	3.3
Maturity	9.6	0.5	7.5	100.2	8.6
By Trade					
Rating	BBB	D	BBB+	AAA	
Size	$93.1 M	$400	$59.9 M	$798 M	$97.3 M
Age	3.9	0	3.1	82.0	3.5
Maturity	11.8	0.5	10	100.2	8.8
Estimation Sample					
By Bonds					
Rating	A-	D	A-	AA+	
Size	$21.8 M	$16,700	$2 M	$200 M	$41.8 M
Age	3.2	0.0	2.1	15.9	3.4
Maturity	10.0	1.0	8.0	31.0	8.7
By Trade					
Rating	BBB+	D	BBB	AAA	
Size	$76 M	$125,300	$49 M	$398 M	$90 M
Age	4.1	0.0	3.2	16.6	3.7
Maturity	11.7	2.0	10.0	31.0	8.2
Appendix Estimation Sample					
By Bonds					
Rating	A-	D	A	AA	
Size	$21 M	$15,600	$1.7 M	$ 199 M	$41 M
Age	3.1	0.0	2.1	15.7	3.4
Maturity	9.8	1.0	7.8	31.0	8.6
By Trade					
Rating	BBB+	D	BBB	AAA	
Size	$90 M	$208,200	$64 M	$398 M	$92 M
Age	4.1	0.0	3.4	16.4	3.6
Maturity	11.2	3.0	10.0	30.5	7.9

Panel B

Full Sample	Mean	P1	Median	P99	Std Dev
By Bonds					
Volume of Trade	1,785.5	0.2	90	250,000	7,258.3
Holding Period (days)	59.8	0	37.2	1,454.4	69.8
Average Spread	0.0189	-0.7143	0.0068	99	0.6269
Centrality Measure	44.6	1	39.4	844.9	30.8
Number of Trades	920	1	109	138,271	3,527
Market Concentration	54.3%	0%	54.4%	100%	22.8%
By Trade					
Volume of Trade	401	0.24	25	619,550	1,777
Holding Period (days)	107	0	16.8	3,447	214
Average Profit Margin	0.1056	0	0.0055	2926.928	0.6
Centrality Measure - Rank	41.7	1	21	1,152	64.4
Estimation Sample					
By Bonds					
Volume of Trade	1,565.1	4.3	75.0	26,000.0	8,356.1
Average Spread	0.6	-0.1	0.5	3.1	0.8
Centrality Measure	59.1	3.0	51.7	269.7	50.3
Number of Trades	170.3	1.0	37.0	2,037.0	526.8
Market Concentration	0.6	0.0	0.7	1.0	0.2
By Trade					
Volume of Trade	443.0	0.0	25.0	5,850.0	2,156.2
Average Profit Margin	0.6	-1.2	0.2	4.5	1.4
Centrality Measure - Rank	52.2	1.0	25.0	554.0	94.3
Appendix Estimation Sample					
By Bonds					
Volume of Trade	984.8	4.3	66.7	12,695.0	4,375.3
Average Spread	0.3	-0.3	0.2	1.5	0.4
Centrality Measure	56.5	5.0	49.3	208.7	42.1
Number of Trades	1,142.4	1.0	141.0	16,732.0	4,180.1
Market Concentration	0.6	0.0	0.6	1.0	0.2
By Trade					
Volume of Trade	314.0	0.0	20.0	5,000.0	1,509.3
Average Profit Margin	0.4	-3.6	0.2	5.8	1.3
Centrality Measure	49.0	1.0	20.0	554.0	95.9

Table A.1
Spreads: Clients vs Dealers

This table reports the coefficient estimates relating the spread (defined as the difference between sell and average buy price by other dealers in the same week for the same bond) with the type of buyer. The sample includes bond transactions for the period 2005-2011 as reported in an enhanced version of TRACE. "Client Buyer" is a dummy equal to one if the buyer is a client. "Log(Transaction Volume)" is the size of the transaction. "Rating" captures the numerical equivalent of the bond rating, with higher number capturing riskier bonds. "Market Share" is the fraction of bond i held in inventory by seller s in the previous quarter normalized by the bond outstanding. Columns (6) and (7) divide the sample between investment grade and non-investment grade bonds, whereas Columns (8) and (9) differentiate between sellers in the core or in the periphery. Column (5) shows the most conservative specification in which we control for week, bond, seller and industry×month fixed effects. Robust standard errors double clustered at both the CUSIP and the week level are reported in parenthesis. Asterisks denote significance levels (***=1%, **=5%, *=10%).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			All Bonds			*Investment Grade Bonds*	*Non-Investment Grade Bonds*	*Core Dealers*	*Periphery Dealers*
Client Buyer	0.936***	1.005***	0.988***	1.044***	1.045***	0.942***	1.133***	0.894***	1.147***
	(0.0279)	(0.0285)	(0.0268)	(0.0283)	(0.0283)	(0.0317)	(0.0414)	(0.0281)	(0.0317)
Log(Transaction Volume)		-0.0751***	-0.0431***	-0.0303***	-0.0304***	-0.0356***	-0.0643***	-0.0645***	-0.00315
		(0.00414)	(0.00452)	(0.00345)	(0.00346)	(0.00451)	(0.0107)	(0.00499)	(0.00529)
Rating			0.00506	0.00621*	0.00605*	0.0180***	0.00535	0.00822*	0.00437
			(0.00339)	(0.00341)	(0.00347)	(0.00633)	(0.00592)	(0.00429)	(0.00407)
Market Share			0.286***	0.518***	0.516***	0.243***	0.466*	0.370***	-0.104
			(0.0933)	(0.0841)	(0.0843)	(0.0934)	(0.263)	(0.130)	(0.119)
Week Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CUSIP Fixed Effects			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Seller Fixed Effects				Yes	Yes				
Industry × Month Fixed Effects					Yes				
Observations	5,296,107	4,674,197	4,674,110	4,673,924	4,673,924	3,538,560	1,135,540	2,714,184	1,959,725
R-squared	0.119	0.139	0.185	0.212	0.215	0.229	0.128	0.195	0.203

Table A.2
Spreads and Network Structure

This table reports the coefficient estimates relating the spreads (defined as the difference between sell and average buy price by other dealers in the same week for the same bond) with the type of counterparty. The sample includes bond transactions for the period 2005-2011 as reported in an enhanced version of TRACE. "Core-Periphery" is a dummy equal to one if the seller is a core dealer and the buyer is a peripheral dealer, while "Periphery-Periphery" identifies transactions between dealers in the periphery, and "Periphery-Core" is a dummy equal to one for transactions where the seller is in the periphery and the buyer is in the core. The comparison group are interdealer transactions between core dealers. Controls include: "Log(Transaction Volume)" which is the size of the transaction, "Rating" which captures the numerical equivalent of the bond rating, and "Market Share" which is the fraction of bond i held in inventory by seller s in the previous quarter normalized by the bond outstanding. Column (4) shows the most conservative specification in which we control for week, bond, and industry×month fixed effects. Columns (5) and (6) divide the sample between investment grade and non-investment grade bonds. Columns (7)-(9) perform a similar analysis but controlling for the interaction between the type of transaction (i.e. Core-Periphery, Periphery-Periphery and Periphery-Core) with the volatility index VIX as provided by CBOE. In these columns we also control for the the log of the transaction size, the bond rating and the market share interacted with the VIX. Robust standard errors double clustered at both the CUSIP and the week level are reported in parenthesis. Asterisks denote significance levels (***=1%, **=5%, *=10%).

	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(3)	(4)
		All Bonds			*Investment Grade Bonds*	*Non-Investment Grade Bonds*	*All Bonds*	*Investment Grade Bonds*	*Non-Investment Grade Bonds*
Core-Periphery	0.110***	0.0884***	0.0883***	0.0893***	0.0973***	0.0513***	0.247***	0.0834***	0.0587***
	(0.00950)	(0.00794)	(0.00810)	(0.00809)	(0.00868)	(0.0151)	(0.0140)	(0.00641)	(0.0177)
Periphery-Periphery	0.00233	-0.0173**	-0.0440***	-0.0435***	-0.0369***	-0.0792***	0.0802***	-0.211***	-0.305***
	(0.00750)	(0.00775)	(0.00815)	(0.00808)	(0.00864)	(0.0186)	(0.0152)	(0.0104)	(0.0233)
Periphery-Core	-0.172***	-0.193***	-0.212***	-0.213***	-0.206***	-0.248***	0.143***	-0.0393***	-0.0978***
	(0.0120)	(0.0119)	(0.0126)	(0.0126)	(0.0125)	(0.0230)	(0.0143)	(0.00834)	(0.0188)
Core-Periphery × VIX							0.0441***	0.0490***	0.0220
							(0.00891)	(0.00828)	(0.0296)
Periphery-Core × VIX							-0.160***	-0.142***	-0.253***
							(0.0136)	(0.0143)	(0.0251)
Periphery-Periphery × VIX							-0.0218**	0.00478	-0.126***
							(0.0105)	(0.0103)	(0.0220)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls×VIX							Yes	Yes	Yes
Week Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CUSIP Fixed Effects			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Month Fixed Effects				Yes			Yes	Yes	Yes
Observations	3,613,400	3,172,063	3,171,960	3,171,960	2,401,439	770,508	3,171,700	2,401,220	770,467
R-squared	0.009	0.012	0.022	0.026	0.027	0.019	0.027	0.033	0.027

Table A.3
Spreads and Bilateral Relationships

This table reports the coefficient estimates relating the spreads (defined as the difference between sell and average buy price by other dealers in the same week for the same bond) with the existing of bilateral relationships between seller and buyer and to their network centrality. The sample includes bond transactions for the period 2005-2011 as reported in an enhanced version of TRACE. "Fraction Selling to Counterparty" is the fraction of sales of this seller to this buyer computed in the previous quarter. Similarly for the "Fraction Buying from Counterparty". "Log(Transaction Volume)" is the size of the transaction. "Rating" captures the numerical equivalent of the bond rating, with higher number capturing riskier bonds. "Market Share" is the fraction of bond i held in inventory by seller s in the previous quarter normalized by the bond outstanding. The centrality measures are computed using the eigenvector centrality measure in the previous quarter. VIX is the volatility index as provided by CBOE. We also control for the bond rating, the market share and the log of the transaction size interacted with the VIX. Robust standard errors double clustered at both the CUSIP and the week level are reported in parenthesis. Asterisks denote significance levels (***=1%, **=5%, *=10%).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fraction Selling to Counterparty	-0.650***	-0.674***	-0.676***	-0.367***	-0.371***	-0.396***	-0.397***	-0.398***
	(0.0286)	(0.0294)	(0.0295)	(0.0164)	(0.0167)	(0.0173)	(0.0177)	(0.0178)
Fraction Buying from Counterparty	0.595***	0.626***	0.629***	0.332***	0.359***	0.337***	0.364***	0.366***
	(0.0231)	(0.0244)	(0.0242)	(0.0162)	(0.0166)	(0.0156)	(0.0160)	(0.0159)
Fraction Selling to Counterparty × VIX						-0.126***	-0.130***	-0.130***
						(0.0244)	(0.0246)	(0.0247)
Fraction Buying from Counterparty × VIX						-0.0273*	-0.0327**	-0.0319**
						(0.0160)	(0.0157)	(0.0158)
Seller Network Centrality × VIX						1.149***	1.210***	1.237***
						(0.139)	(0.140)	(0.140)
Buyer Network Centrality × VIX						-0.959***	-0.987***	-0.986***
						(0.121)	(0.120)	(0.121)
Seller Network Centrality				1.983***	2.239***	2.011***	2.282***	2.298***
				(0.149)	(0.156)	(0.118)	(0.124)	(0.124)
Buyer Network Centrality				-1.295***	-1.273***	-1.242***	-1.209***	-1.213***
				(0.0995)	(0.105)	(0.0820)	(0.0846)	(0.0847)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls×VIX					Yes	Yes	Yes	Yes
Week Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CUSIP Fixed Effects		Yes	Yes		Yes	Yes	Yes	Yes
Industry × Month FE			Yes					Yes
Seller × Month FE								
Buyer × Month FE								
Observations	2,970,946	2,970,842	2,970,842	2,820,028	2,819,921	2,819,779	2,819,672	2,819,672
R-squared	0.015	0.025	0.028	0.020	0.031	0.025	0.037	0.040