

## Internet Appendix to : “Does Disagreement Facilitate Informed Trading?”

TABLE IA1

### Informed Trading and Returns

In this table, we report monthly results pertaining to the relationship between activist and short sellers’ trading and future returns. The dependent variable is next month’s returns multiplied by 100. TRADE DUMMY is an indicator variable that equals 100 if there was activist trading for firm  $i$  in month  $m$ , and zero otherwise. SHORT INTEREST SPIKE is 100 if there was at least a 1% daily increase in fraction of shares on loan in month  $m$ , and zero otherwise. Fraction of shares on loan is calculated as the number of shares on loan divided by the number of shares outstanding. Controls include MEDIA PRIOR MONTH, equals 1 if the company had at least one story on Dow Jones News Wire in month  $m$ , VOLATILITY PRIOR MONTH is the standard deviation of returns over the calendar month  $m$ , RETURN PRIOR MONTH is the return over the calendar month  $m$ , and RETURN PRIOR YEAR, is the return from month  $m - 12$  through month  $m - 1$ . Regressions include month fixed effects, where noted. Heteroskedasticity-robust standard errors reported in parenthesis. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	RETURNS (m+1)			
	(1)	(2)	(3)	(4)
TRADE DUMMY	1.4277*** (0.254)	1.5851*** (0.258)		
SHORT INTEREST SPIKE			-0.3272*** (0.069)	-0.2143*** (0.070)
MEDIA PRIOR MONTH		-0.0273 (0.036)		-0.2034*** (0.041)
VOLATILITY PRIOR MONTH		-5.5139*** (0.755)		-3.2706*** (1.000)
RETURN PRIOR MONTH		-0.0282*** (0.001)		-0.0303*** (0.002)
RETURN PRIOR YEAR		0.0023*** (0.000)		0.0012*** (0.000)
Observations	747,018	685,478	448,571	424,348
R-squared	0.000	0.009	0.000	0.009
Month FEs		Yes		Yes

TABLE IA2

**Alternative Liquidity Measures**

In this table we consider alternative measures of liquidity to turnover. Amihud illiquidity measure is based on Amihud (2002), Quote Spread, Effective Spread, Realized Spread, and Price Impact are constructed from high-frequency TAQ data. DISAGREEMENT (z) and NUMBER OF MESSAGES (z) are measured between 4 p.m. on day  $t - 1$  and 4 p.m. on day  $t$ , and are standardized. Controls include turnover on day  $t - 1$ , MEDIA, equals 1 if the company had at least one story on Dow Jones News Wire on day  $t$ ,  $Volatility(t - 5, t - 1)$ , is the standard deviation of returns over days  $t - 5$  to  $t - 1$ , and cumulative abnormal returns over days  $t - 30$  to  $t - 6$  and  $t - 5$  to  $t - 1$ . All regressions include firm and date fixed effects. Heteroskedasticity-robust standard errors are double-clustered at the firm and date levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Amihud (1)	Bid-Ask Spread (2)	Quoted Spread (3)
DISAGREEMENT (z)	-0.0604*** (0.005)	-0.0623*** (0.003)	-0.0516*** (0.010)
NUMBER OF MESSAGES (z)	-0.0317* (0.017)	-0.0390*** (0.012)	-0.0164 (0.028)
Observations	14,994,105	15,377,784	10,094,747
R-squared	0.117	0.515	0.690
DISAGREEMENT effect size	-0.58%	-1.60%	-0.21%
Standard Deviation	10.444	3.901	24.515
Controls	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes
Date FEs	Yes	Yes	Yes

	Effective Spread (4)	Realized Spread (5)	Price Impact (6)
DISAGREEMENT (z)	-0.0118** (0.006)	-0.0994*** (0.005)	0.0679*** (0.004)
NUMBER OF MESSAGES (z) 4	0.0004 (0.016)	-0.0174* (0.010)	0.0150 (0.010)
Observations	10,061,924	10,059,288	10,058,521
R-squared	0.646	0.326	0.174
DISAGREEMENT effect size	-0.07%	-0.55%	0.66%
Standard Deviation	16.788	18.033	10.277
Controls	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes
Date FEs	Yes	Yes	Yes

TABLE IA3

**Informed Trading and Short Interest Spike Cutoffs**

In this table, we report results pertaining to the relationship between short interest spikes and disagreement among investors, for different spike cutoffs. DISAGREEMENT ( $z$ ) and NUMBER OF MESSAGES ( $z$ ) are measured between 4 p.m. on day  $t - 1$  and 4 p.m. on day  $t$ , and are standardized. The dependent variable, SHORT INTEREST SPIKE, is 100 if the increase in fraction of shares on loan from day  $t - 1$  to  $t$  was at least 2% in column 1, at least 1% in column 2 and at least 0.5% in column 3. Fraction of shares on loan is calculated as the number of shares on loan divided by the number of shares outstanding. Controls include turnover on day  $t - 1$ , MEDIA, equals 1 if the company had at least one story on Dow Jones News Wire on day  $t$ ,  $Volatility(t - 5, t - 1)$ , is the standard deviation of returns over days  $t - 5$  to  $t - 1$ , and cumulative abnormal returns over days  $t - 30$  to  $t - 6$  and  $t - 5$  to  $t - 1$ . All regressions include firm and date fixed effects. Heteroskedasticity-robust standard errors are double-clustered at firm and date level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable: Cutoff:	SHORT INTEREST SPIKE		
	2% (1)	1% (2)	0.5% (3)
DISAGREEMENT ( $z$ )	0.0060** (0.003)	0.0414*** (0.006)	0.1518*** (0.011)
NUMBER OF MESSAGES ( $z$ )	-0.0112 (0.008)	-0.0330* (0.017)	-0.0467* (0.026)
SHORT INTEREST SPIKE ( $t-1$ )	0.0209*** (0.002)	0.0295*** (0.001)	0.0414*** (0.001)
Observations	8,614,152	8,614,152	8,614,152
R-squared	0.024	0.037	0.059
DISAGREEMENT effect size Mean	3.774% 0.159	6.193% 0.668	6.851% 2.216
Firm FEs	Yes	Yes	Yes
Date FEs	Yes	Yes	Yes

TABLE IA4

**Different Utilization Cutoffs**

In this table, we report results pertaining to the relationship between returns and disagreement for high- and low-utilization samples for different definitions of high vs. low utilization. Returns, is calculated as the close-to-close return obtained from CRSP, multiplied by 100. DISAGREEMENT ( $z$ ) and NUMBER OF MESSAGES ( $z$ ) are measured between 4 p.m. on day  $t - 1$  and 4 p.m. on day  $t$ , and are standardized. We split the sample into high and low utilization subsamples. The utilization measure on day  $t$  is obtained from Markit data set and HIGH UTILIZATION is defined as the average utilization over days  $t - 5$  to  $t - 1$  being greater or equal to 50% in columns 1 and 4, 60% in columns 2 and 5, and 70% in columns 3 and 6. Controls include disagreement and number of messages on day  $t - 1$ , turnover on day  $t - 1$ , MEDIA, equals 1 if the company had at least one story on Dow Jones News Wire on day  $t$ , VOLATILITY ( $t - 5, t - 1$ ), is the standard deviation of returns over days  $t - 5$  to  $t - 1$ , and cumulative abnormal returns over days  $t - 30$  to  $t - 6$  and  $t - 5$  to  $t - 1$ . All regressions include firm and date fixed effects. Heteroskedasticity-robust standard errors are double-clustered at the firm and date levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable: Sub-sample: Cutoffs:	RETURNS					
	HIGH UTILIZATION			LOW UTILIZATION		
	50%	60%	70%	50%	60%	70%
	(1)	(2)	(3)	(4)	(5)	(6)
DISAGREEMENT ( $z$ )	0.1348*** (0.009)	0.1398*** (0.010)	0.1457*** (0.012)	0.0859*** (0.005)	0.0869*** (0.005)	0.0881*** (0.004)
NUMBER OF MESSAGES ( $z$ )	0.2092*** (0.046)	0.2138*** (0.041)	0.2444*** (0.042)	0.1251** (0.059)	0.1292** (0.057)	0.1297** (0.052)
DISAGREEMENT ( $t-1$ ) ( $z$ )	-0.0480*** (0.005)	-0.0545*** (0.006)	-0.0644*** (0.007)	-0.0086*** (0.002)	-0.0092*** (0.002)	-0.0100*** (0.002)
NUMBER OF MESSAGES ( $t-1$ ) ( $z$ )	-0.1422*** (0.033)	-0.1429*** (0.029)	-0.1636*** (0.028)	-0.0944** (0.041)	-0.0981** (0.039)	-0.0977*** (0.036)
TURNOVER ( $t-1$ )	-0.0308*** (0.004)	-0.0319*** (0.004)	-0.0339*** (0.005)	-0.0041 (0.003)	-0.0068** (0.003)	-0.0085*** (0.003)
MEDIA	-0.0309 (0.028)	-0.0324 (0.036)	-0.0296 (0.047)	0.0507*** (0.007)	0.0487*** (0.007)	0.0473*** (0.007)
VOLATILITY ( $t-1, t-5$ )	0.0849 (0.357)	0.1914 (0.390)	0.4895 (0.455)	0.8376*** (0.257)	0.7466*** (0.254)	0.6478*** (0.249)
CAR( $t-1, t-5$ )	-1.0812*** (0.127)	-1.1139*** (0.134)	-1.1862*** (0.146)	-1.9631*** (0.118)	-1.8856*** (0.116)	-1.8171*** (0.115)
CAR( $t-30, t-6$ )	-0.2333*** (0.039)	-0.2433*** (0.042)	-0.2412*** (0.046)	-0.1660*** (0.030)	-0.1593*** (0.030)	-0.1623*** (0.030)
Observations	883,286	680,010	508,510	8,074,291	8,277,558	8,449,063
R-squared	0.103	0.097	0.092	0.143	0.142	0.140
DISAGREEMENT effect size	3.45%	5.10%	3.63%	3.31%	3.31%	3.31%
Standard Deviation	3.903	2.742	4.014	2.598	2.629	2.660
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Date FEs	Yes	Yes	Yes	Yes	Yes	Yes

TABLE IA5

**Informed Trading and Overnight Investor Disagreement**

In this table, we report results pertaining to the relationship between informed trading and disagreement among investors between market close on day  $t - 1$  and market open on day  $t$ . DISAGREEMENT - NIGHT ( $z$ ) and NUMBER OF MESSAGES - NIGHT ( $z$ ) are measured between 4 p.m. on day  $t - 1$  and 9 a.m. on day  $t$ , and are standardized. In column 1 the dependent variable is an indicator variable that equals 100 if there was activist trading for firm  $i$  on day  $t$ , and zero otherwise. The sample covers the 60-day period prior to Schedule 13D filings during 2010-2018. In column 2 the dependent variable is 100 if there was at least a 1% increase in fraction of shares on loan from day  $t - 1$  to  $t$ , and zero otherwise. Fraction of shares on loan is calculated as the number of shares on loan divided by the number of shares outstanding. Controls include turnover on day  $t - 1$ , MEDIA, equals 1 if the company had at least one story on Dow Jones News Wire on day  $t$ , VOLATILITY ( $t - 5, t - 1$ ), is the standard deviation of returns over days  $t - 5$  to  $t - 1$ , and cumulative abnormal returns over days  $t - 30$  to  $t - 6$  and  $t - 5$  to  $t - 1$ . All regressions include firm and date fixed effects. Heteroskedasticity-robust standard errors are double-clustered at firm and date level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Activist Trade Dummy (1)	Short Increase Spike (2)
DISAGREEMENT - NIGHT ( $z$ )	0.9113*** (0.207)	0.0211*** (0.006)
NUMBER OF MESSAGES - NIGHT ( $z$ )	2.1353*** (0.639)	-0.0286** (0.014)
ACTIVIST TRADE DUMMY ( $t-1$ )	0.4607*** (0.008)	
SHORT INTEREST SPIKE ( $t-1$ )		0.0295*** (0.001)
Observations	55,029	8,614,152
R-squared	0.413	0.037
DISAGREEMENT effect size	2.444%	3.156%
Mean	37.282	0.668
Controls	Yes	Yes
Firm FEs	Yes	Yes
Date FEs	Yes	Yes

TABLE IA6

**Informed Trading and Technical Overnight Investor Disagreement**

In this table, we report results pertaining to the relationship between informed trading and disagreement among investors who classify themselves as having a technical approach between market close on day  $t - 1$  and market open on day  $t$ . TECHNICAL DISAGREEMENT Night ( $z$ ) and TECHNICAL NUM MESSAGES NIGHT ( $z$ ) are measured between 4 p.m. on day  $t - 1$  and 9 a.m. on day  $t$  for investors who self-classify themselves as having a “Technical” approach, and are standardized. In column 1 the dependent variable is an indicator variable that equals 100 if there was activist trading for firm  $i$  on day  $t$ , and zero otherwise. The sample covers the 60-day period prior to Schedule 13D filings during 2010-2018. In column 2 the dependent variable is 100 if there was at least a 1% increase in fraction of shares on loan from day  $t - 1$  to  $t$ , and zero otherwise. Fraction of shares on loan is calculated as the number of shares on loan divided by the number of shares outstanding. Controls include turnover on day  $t - 1$ , MEDIA, equals 1 if the company had at least one story on Dow Jones News Wire on day  $t$ , VOLATILITY ( $t - 5, t - 1$ ), is the standard deviation of returns over days  $t - 5$  to  $t - 1$ , and cumulative abnormal returns over days  $t - 30$  to  $t - 6$  and  $t - 5$  to  $t - 1$ . All regressions include firm and date fixed effects. Heteroskedasticity-robust standard errors are double-clustered at firm and date level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Activist Trade Dummy (1)	Short Increase Spike (2)
TECHNICAL DISAGREEMENT NIGHT ( $z$ )	0.4770* (0.250)	0.0107* (0.006)
TECHNICAL NUM MESSAGES NIGHT ( $z$ )	2.0706*** (0.473)	-0.0197* (0.012)
ACTIVIST TRADE DUMMY ( $t-1$ )	0.4606*** (0.008)	
SHORT INTEREST SPIKE ( $t-1$ )		0.0295*** (0.001)
Observations	55,029	8,614,152
R-squared	0.413	0.037
DISAGREEMENT effect size Mean	1.279% 37.282	1.601% 0.668
Controls	Yes	Yes
Firm FEs	Yes	Yes
Date FEs	Yes	Yes

TABLE IA7

**Informed Trading and Self-classified Disagreement**

In this table, we report results pertaining to the relationship between informed trading and disagreement among investors based on messages where investors self-classified the sentiment of the message. SELF-CLASSIFIED DISAGREEMENT ( $z$ ) and SELF-CLASSIFIED NUM. MESSAGES ( $z$ ) are measured between 4 p.m. on day  $t - 1$  and 4 p.m. on day  $t$  and we only consider messages where the author of the tweet either classified it as “Bearish” or “Bullish.” Both measures are standardized. In column 1 the dependent variable is an indicator variable that equals 100 if there was activist trading for firm  $i$  on day  $t$ , and zero otherwise. The sample covers the 60-day period prior to Schedule 13D filings during 2010-2018. In column 2 the dependent variable is 100 if there was at least a 1% increase in fraction of shares on loan from day  $t - 1$  to  $t$ , and zero otherwise. Fraction of shares on loan is calculated as the number of shares on loan divided by the number of shares outstanding. Controls include turnover on day  $t - 1$ , MEDIA, equals 1 if the company had at least one story on Dow Jones News Wire on day  $t$ , VOLATILITY ( $t - 5, t - 1$ ), is the standard deviation of returns over days  $t - 5$  to  $t - 1$ , and cumulative abnormal returns over days  $t - 30$  to  $t - 6$  and  $t - 5$  to  $t - 1$ . All regressions include firm and date fixed effects. Heteroskedasticity-robust standard errors are double-clustered at firm and date level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Activist Trade Dummy (1)	Short Increase Spike (2)
SELF-CLASSIFIED DISAGREEMENT ( $z$ )	0.7940*** (0.259)	0.0295*** (0.008)
SELF-CLASSIFIED NUM. MESSAGES ( $z$ )	1.0766*** (0.398)	-0.0521*** (0.019)
ACTIVIST TRADE DUMMY ( $t-1$ )	0.4604*** (0.008)	
SHORT INTEREST SPIKE ( $t-1$ )		0.0295*** (0.001)
Observations	55,029	8,614,152
R-squared	0.412	0.037
DISAGREEMENT effect size Mean	2.130% 37.282	4.413% 0.668
Controls	Yes	Yes
Firm FEs	Yes	Yes
Date FEs	Yes	Yes

TABLE IA8

**Days with at least Two Messages**

In this table, we report results pertaining to the relationship between informed trading and disagreement among investors on days with at least two messages on StockTwits about the firm. DISAGREEMENT ( $z$ ) and NUMBER OF MESSAGES ( $z$ ) are measured between 4 p.m. on day  $t - 1$  and 4 p.m. on day  $t$ , and are standardized. In column 1 the dependent variable is an indicator variable that equals 100 if there was activist trading for firm  $i$  on day  $t$ , and zero otherwise. The sample covers the 60-day period prior to Schedule 13D filings during 2010-2018. In column 2 the dependent variable is 100 if there was at least a 1% increase in fraction of shares on loan from day  $t - 1$  to  $t$ , and zero otherwise. Fraction of shares on loan is calculated as the number of shares on loan divided by the number of shares outstanding. Controls include turnover on day  $t - 1$ , MEDIA, equals 1 if the company had at least one story on Dow Jones News Wire on day  $t$ , VOLATILITY ( $t - 5, t - 1$ ), is the standard deviation of returns over days  $t - 5$  to  $t - 1$ , and cumulative abnormal returns over days  $t - 30$  to  $t - 6$  and  $t - 5$  to  $t - 1$ . All regressions include firm and date fixed effects where indicated. Heteroskedasticity-robust standard errors are double-clustered at the firm and date levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Activist Trade Dummy (1)	Short Increase Spike (2)
DISAGREEMENT ( $z$ )	0.3459* (0.185)	0.0247*** (0.006)
NUMBER OF MESSAGES ( $z$ )	2.1464*** (0.421)	0.0034 (0.010)
ACTIVIST TRADE DUMMY ( $t-1$ )	0.3728*** (0.019)	
SHORT INTEREST SPIKE ( $t-1$ )		0.0394*** (0.003)
Observations	5,514	1,108,120
R-squared	0.605	0.051
DISAGREEMENT effect size Mean	0.844% 41	1.880% 1.314
Controls	Yes	Yes
Firm FEs	Yes	Yes
Date FEs	Yes	Yes

TABLE IA9

**Controlling for Investor Sentiment**

In this table we report results pertaining to the relationship between informed trading and disagreement among investors while controlling for investor sentiment. DISAGREEMENT ( $z$ ) and NUMBER OF MESSAGES ( $z$ ) are measured between 4 p.m. on day  $t - 1$  and 4 p.m. on day  $t$ , and are standardized. In column 1 the dependent variable is an indicator variable that equals 100 if there was activist trading for firm  $i$  on day  $t$ , and zero otherwise. The sample covers the 60-day period prior to Schedule 13D filings during 2010-2018. In column 2 the dependent variable is 100 if there was at least a 1% increase in fraction of shares on loan from day  $t - 1$  to  $t$ , and zero otherwise. Fraction of shares on loan is calculated as the number of shares on loan divided by the number of shares outstanding. Controls include turnover on day  $t - 1$ , MEDIA, equals 1 if the company had at least one story on Dow Jones News Wire on day  $t$ , VOLATILITY ( $t - 5, t - 1$ ), is the standard deviation of returns over days  $t - 5$  to  $t - 1$ , and cumulative abnormal returns over days  $t - 30$  to  $t - 6$  and  $t - 5$  to  $t - 1$ . AVG. SENTIMENT is the average sentiment of messages posted about firm  $i$  on day  $t$ . All regressions include firm and date fixed effects where indicated. Heteroskedasticity-robust standard errors are double-clustered at the firm and date levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Activist Trade Dummy (1)	Short Increase Spike (2)
DISAGREEMENT ( $z$ )	0.8401*** (0.203)	0.0423*** (0.006)
NUMBER OF MESSAGES ( $z$ )	2.3722*** (0.445)	-0.0336** (0.017)
ACTIVIST TRADE DUMMY (t-1)	0.4605*** (0.008)	
SHORT INTEREST SPIKE (t-1)		0.0295*** (0.001)
AVG. SENTIMENT	-0.189 (0.454)	0.0506*** (0.009)
Observations	55,029	8,614,152
R-squared	0.413	0.037
DISAGREEMENT effect size	2.253%	6.328%
Mean	37.281	0.668
Controls	Yes	Yes
Firm FEs	Yes	Yes
Date FEs	Yes	Yes

TABLE IA10

**Controlling for Retail Order Imbalance**

In this table we report results pertaining to the relationship between informed trading and disagreement among investors while controlling for retail order imbalance. DISAGREEMENT (z) and NUMBER OF MESSAGES (z) are measured between 4 p.m. on day  $t - 1$  and 4 p.m. on day  $t$ , and are standardized. In column 1 the dependent variable is an indicator variable that equals 100 if there was activist trading for firm  $i$  on day  $t$ , and zero otherwise. The sample covers the 60-day period prior to Schedule 13D filings during 2010-2018. In column 2 the dependent variable is 100 if there was at least a 1% increase in fraction of shares on loan from day  $t - 1$  to  $t$ , and zero otherwise. Fraction of shares on loan is calculated as the number of shares on loan divided by the number of shares outstanding. Controls include turnover on day  $t - 1$ , MEDIA, equals 1 if the company had at least one story on Dow Jones News Wire on day  $t$ , VOLATILITY ( $t - 5, t - 1$ ), is the standard deviation of returns over days  $t - 5$  to  $t - 1$ , and cumulative abnormal returns over days  $t - 30$  to  $t - 6$  and  $t - 5$  to  $t - 1$ . RETAIL ORDER IMBALANCE is calculated as the difference between retail buying and selling volume, divided by the total retail trading volume. All regressions include firm and date fixed effects where indicated. Heteroskedasticity-robust standard errors are double-clustered at the firm and date levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Activist Trade Dummy (1)	Short Increase Spike (2)
DISAGREEMENT (z)	0.7525*** (0.204)	0.0421*** (0.006)
NUMBER OF MESSAGES (z)	2.6466*** (0.471)	-0.0296* (0.017)
ACTIVIST TRADE DUMMY (t-1)	0.4685*** (0.008)	
SHORT INTEREST SPIKE (t-1)		0.0285*** (0.001)
RETAIL ORDER IMBALANCE	-0.7184* (0.383)	0.0133* (0.007)
Observations	51,275	7,983,559
R-squared	0.419	0.037
DISAGREEMENT effect size	2.018%	6.298%
Mean	37.281	0.668
Controls	Yes	Yes
Firm FEs	Yes	Yes
Date FEs	Yes	Yes