

Internet Appendix

First to “Read” the News: News Analytics and High Frequency Trading

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IA-Table 1: Change in long-run market reaction after RavenPack is live

This table examines whether the 2-minute market reaction to LRH articles and HRL articles changed after RavenPack went live. In regression 1 and 2, the dependent variable is the absolute return from $t-1$ to $t+120$ seconds around the article (in basis points). In regression 3 and 4, the dependent variable is the turnover from $t-1$ to $t+120$ seconds around the article (in basis points) divided by the average daily turnover from $t-20$ to $t-1$ days before the article (in %). In regressions 1 and 3, the sample consists of only LRH articles. In regressions 2 and 4, the sample consists of only HRL articles. Both samples contain articles before and after RavenPack went live. *RavenPack Release* is a dummy variable taking the value of 1 for articles after RavenPack went “live” on April 1, 2009, and zero otherwise. All variables are defined in Appendix 1 in the paper. All standard errors are two-way clustered by stock and date. T-statistics are below the parameter estimates in parenthesis; ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. At the bottom of the table we report standard deviations for comparison.

Dependent Variable:	Absolute Return $t-1, t+120$ (in bp)		Turnover $t-1, t+120$ / Turnover days $t-20, t-1$	
Sample	LRH articles	HRL articles	LRH articles	HRL articles
	(1)	(2)	(3)	(4)
RavenPack Release	-0.4878 (-0.89)	-0.6138 (-1.12)	0.0951 (0.84)	-0.0145 (-0.25)
Number of Observations	24173	19735	24173	19735
Relevance, Category and Hour Fixed Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes

Standard Deviations

Absolute Return $t-1, t+120$: 23.5

Mean of Turnover $t-1, t+120$ / Turnover days $t-20, t-1$: 5.02

IA-Table 2: Underreaction to RavenPack sentiment information

This table contains the results of article-level regressions that examine how well the sentiment direction of an article predicts the two minute return following the first 5 seconds after an article. The dependent variable is the return from 5 seconds after the article to 120 seconds after the article (measured in basis points). Returns are based on mid-quotes. *Sentiment Direction*, which indicates the sentiment of the article derived from RavenPack sentiment indices; it takes the value +1 for positive sentiment, 0 for neutral sentiment and -1 for negative sentiment. The sample contains all HRH articles during the time in which RavenPack was “live” (April 1, 2009 – September 10, 2012). In all regressions we include firm and date fixed effects and the following firm specific control variables: Company size, Return prior month, Volatility prior month, Turnover prior month, Illiquidity prior month. In regressions 2 and 3, we add fixed effects for the article category (e.g. mergers and acquisitions), the relevance score (from 90 to 100) and the hour during the day in which the article was released. In regression 3, we include absolute return, turnover, and volatility each for industry and market from $t-1$ to $t+5$ seconds around the article. All variables are defined in Appendix 1. All standard errors are two-way clustered by stock and date. T-statistics are below the parameter estimates in parenthesis; ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable:	Return $t+5$, $t+120$ (in bp)		
	Main Test - RavenPack is “live”		
	(1)	(2)	(3)
Sentiment Direction	1.198*** (11.46)	1.344*** (11.87)	1.345*** (12.00)
Time since last article		0.181*** (5.97)	0.181*** (5.97)
Number of firms in article		0.011 (0.14)	0.015 (0.19)
Number of Observations	314420	314420	314420
R ²	0.041	0.043	0.043
Relevance, Category and Hour Fixed Effects	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes
Market control variables	No	No	Yes
Firm specific control variables	Yes	Yes	Yes

IA-Table 3: Verify that Past Informativeness predicts Informativeness

This table contains the results of article-level regressions that examine how well the sentiment direction of an article predicts the 120-second return reaction to an article depending on *Past Informativeness*. In Panel A, the dependent variable is the return from 1 second before to 120 seconds after the article (measured in basis points). In Panel B, it is the sign of this return (1 for positive returns, 0 for zero returns, -1 for negative returns) The explanatory variable of interest is an interaction between *Sentiment Direction* and *Past Informativeness*. *Sentiment Direction* is a variable indicating the sentiment of the article derived from RavenPack sentiment indices; it takes the value +1 for positive sentiment, 0 for neutral sentiment and -1 for negative sentiment. *Past Informativeness (3 month)* is the average signed return from t-1 to t+120 seconds around articles over the previous 6 months (3 months). *Stock-Level Past Informativeness* is the average signed return from t-1 to t+120 seconds around articles over the previous 6 month for the specific stock. *Direction-Based Past Informativeness* is the percentage of articles over the past 6 months for which the sentiment direction of the article and the sign of the return from t-1 to t+120 seconds around the article agree (excluding returns and sentiment with value of zero). In all regressions we include firm and date fixed effects and the following firm specific control variables: Company size, Return prior month, Volatility prior month, Turnover prior month, Illiquidity prior month. We also include fixed effects for the article category (e.g. mergers and acquisitions), the relevance score (from 90 to 100) and the hour during the day in which the article was released and absolute return, turnover, and volatility each for industry and market from t-1 to t+120 seconds around the article. All variables are defined in Appendix 1 in the paper. All standard errors are two-way clustered by stock and date. T-statistics are below the parameter estimates in parenthesis; ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Predicting returns

Dependent Variable:	Return t-1, t+120 (in bp)				
	(1)	(2)	(3)	(4)	(5)
Past Informativeness * Sentiment Direction		0.951*** (8.19)			
Direction-Based Past Informativeness * Sentiment Direction			51.843*** (4.21)		
Past Informativeness 3 Month * Sentiment Direction				0.905*** (8.66)	
Stock-Level Past Informativeness * Sentiment Direction					0.056*** (8.42)
Sentiment Direction	1.923*** (24.99)	0.001 (0.01)	-15.474*** (-3.77)	0.110 (0.61)	1.753*** (24.31)
Stock-Level Past Informativeness					-0.012** (-2.29)
Article category identified	0.592 (0.26)	0.818 (0.37)	0.749 (0.34)	0.719 (0.33)	0.655 (0.29)
Time since last article	0.503*** (17.24)	0.503*** (17.19)	0.502*** (17.15)	0.502*** (17.17)	0.459*** (15.96)
Number of firms in article	-0.544*** (-9.70)	-0.555*** (-9.81)	-0.544*** (-9.66)	-0.555*** (-9.80)	-0.518*** (-9.25)
Number of Observations	803725	794611	794611	794611	766416
R ²	0.043	0.043	0.043	0.043	0.042
Relevance, Category and Hour Fixed Effects	Yes	Yes	Yes	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Market control variables	Yes	Yes	Yes	Yes	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes

Panel B: Predicting return sign

Dependent Variable:	Sign(Return t-1, t+120)				
	(1)	(2)	(3)	(4)	(5)
Past Informativeness * Sentiment Direction		0.013*** (5.87)			
Direction-Based Past Informativeness * Sentiment Direction			0.788*** (3.00)		
Past Informativeness 3 Month * Sentiment Direction				0.013*** (6.11)	
Stock-Level Past Informativeness * Sentiment Direction					0.000*** (3.30)
Sentiment Direction	0.040*** (21.54)	0.013*** (2.69)	-0.225** (-2.55)	0.015*** (3.33)	0.039*** (20.62)
Stock-Level Past Informativeness					-0.000 (-1.59)
Article category identified	-0.005 (-0.03)	-0.003 (-0.02)	-0.004 (-0.03)	-0.004 (-0.03)	-0.005 (-0.03)
Time since last article	0.005*** (7.59)	0.005*** (7.51)	0.005*** (7.49)	0.005*** (7.49)	0.004*** (6.91)
Number of firms in article	-0.005*** (-3.14)	-0.005*** (-3.16)	-0.005*** (-3.07)	-0.005*** (-3.16)	-0.006*** (-3.20)
Number of Observations	803725	794611	794611	794611	766416
R ²	0.013	0.013	0.013	0.013	0.013
Relevance, Category and Hour Fixed Effects	Yes	Yes	Yes	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Market control variables	Yes	Yes	Yes	Yes	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes

IA-Table 4: Robustness check to Table 9 in the paper

Panel A of this table contains a robustness check to Table 9 in the paper in which we use *Direction-Based Past Informativeness*, which is defined as the percentage of articles in the past 6 month where the sentiment of the article and the direction of the return from t-1 to t+120 seconds around the article agree (excluding returns and sentiment values of zero). In regressions 1 to 3, we use the time in which RavenPack was “live” (April 1, 2009 – September 10, 2012). In regressions 4 to 6, we run a placebo test for the time period where RavenPack was not yet sold to investors (February 1, 2004 – March 31, 2009). Panel B of this table contains another robustness check, where we use the usual measure of *Past Informativeness* but base it on 3 months instead of 6 months. We also provide a robustness check using *Stock-Level Past Informativeness*, which is computed based on the articles for this stock over the past 6 months. These regressions are run during the time in which RavenPack was “live” (April 1, 2009 – September 10, 2012). In all regressions we include firm and date fixed effects and the following firm specific control variables: Company size, Return prior month, Volatility prior month, Turnover prior month, Illiquidity prior month. In regressions 2, 3, 5 and 6, we add fixed effects for the article category (e.g. mergers and acquisitions), the relevance score (from 90 to 100) and the hour during the day in which the article was released. In regressions 3 and 6, we add additional controls: the absolute return, turnover, and volatility each for industry and market and for the two horizons from t-1 to t+5 seconds around the article. Control variables are defined in Appendix 1. All standard errors are two-way clustered by stock and date. T-statistics are below the parameter estimates in parenthesis; ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Direction-Based Past Informativeness

Dependent Variable:	Signed Return t-1, t+5 (in bp)					
	Main Test - RavenPack is “live”			Placebo Test - Before RavenPack is “live”		
	(1)	(2)	(3)	(4)	(5)	(6)
Direction-Based Past Informativeness * D(HRH)	49.548** (2.48)	46.518** (2.32)	50.076** (2.50)	-29.919 (-0.83)	-29.539 (-0.81)	-27.945 (-0.77)
D(HRH)	-16.450** (-2.43)	-15.464** (-2.28)	-16.673** (-2.46)	10.121 (0.84)	10.081 (0.83)	9.541 (0.79)
Article category identified		1.039* (1.93)	0.730 (1.31)		-0.039 (-0.09)	0.032 (0.07)
Time since last article		0.056*** (3.43)	0.055*** (3.41)		0.251*** (12.39)	0.252*** (12.45)
Number of firms in article		-0.208*** (-4.99)	-0.197*** (-4.76)		-0.170*** (-5.24)	-0.167*** (-5.13)
Number of Observations	198225	198225	198225	310657	310657	310657
R ²	0.085	0.090	0.094	0.073	0.079	0.080
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Market control variables	No	No	Yes	No	No	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Past Informativeness 3 Month and Stock-Level Past Informativeness

Dependent Variable:	Signed Return t-1, t+5 (in bp)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Past Informativeness 3 Month * D(HRH)	0.358*** (3.21)	0.290*** (2.60)	0.308*** (2.73)		
Stock-Level Past Informativeness * D(HRH)				0.046** (2.21)	0.046** (2.16)	0.047** (2.24)
D(HRH)	-0.243 (-1.16)	-0.167 (-0.79)	-0.199 (-0.94)	0.255** (2.12)	0.198 (1.60)	0.189 (1.55)
Stock-Level Past Informativeness				-0.055*** (-2.66)	-0.054*** (-2.60)	-0.056*** (-2.71)
Article category identified		1.041* (1.93)	0.733 (1.31)		1.002* (1.87)	0.669 (1.15)
Time since last article		0.056*** (3.43)	0.055*** (3.41)		0.056*** (3.42)	0.055*** (3.38)
Number of firms in article		-0.208*** (-4.98)	-0.197*** (-4.75)		-0.206*** (-5.17)	-0.194*** (-4.91)
Number of Observations	198225	198225	198225	193473	193473	193473
R ²	0.085	0.090	0.094	0.081	0.086	0.091
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Market control variables	No	No	Yes	No	No	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes	Yes

IA-Table 5: Additional Robustness Checks

This table contains the results of different robustness checks. All regressions are at the article-level. In Panel A, we implement an alternative Placebo test which excludes the financial crisis and only includes the time period from February 1, 2004 to December 31, 2007 before RavenPack was “live”. In Panel B, we implement an alternative Placebo test which excludes the time period before the introduction of Regulation NMS. It includes the time period from July 10, 2008 to April 1, 2009 before RavenPack was “live”. In Panel C, we implement a robustness test in which we include only the time when RavenPack 1 was active, i.e. from April 1, 2009 to July 6, 2011. In Panel D, we implement a robustness test in which we exclude articles with more than 3 firms and add fixed effects for the number of firms mentioned in the article and include the full after RavenPack period (April 1, 2009 – September 10, 2012). In Panel E, we implement a robustness check where we add the following additional controls: D(article in last hour), D(article earlier in the day), D(article during prior trading day), log(number of articles in last week). In all cases, the dependent variable in Regressions 1 and 2 is *Speed of Stock Price Response* (in percent) defined as $\frac{\text{Abs}(\text{Return } t-1, t+5)}{\text{Abs}(\text{Return } t-1, t+5) + \text{Abs}(\text{Return } t+6, t+120)}$. In Regressions 3 and 4, the dependent variable is *Speed of Trade Volume Response* (in percent), defined as the turnover from 1 second before the article to 5 seconds after the article divided by the turnover from 1 second before the article to 120 seconds after the article. In Regressions 1 to 4, the explanatory variable of interest is D(HRH), a dummy variable equal to 1 if an article was consistently released as highly relevant in both RavenPack versions and 0 if it was originally released as having low relevance (HRL). In Regressions 5 and 6, the dependent variable is the return (measured in basis points) from 1 second before to 5 seconds after the article. In Regressions 5 and 6, the explanatory variable of interest is an interaction between *D(HRH)* and *Sentiment Direction*, where *Sentiment Direction* is a variable indicating the sentiment of the article derived from RavenPack sentiment indices. It takes the value +1 for positive sentiment, 0 for neutral sentiment and -1 for negative sentiment. In all regressions we include firm and date fixed effects and the following firm specific control variables: Company size, Return prior month, Volatility prior month, Turnover prior month, Illiquidity prior month. In regressions 2, 4, and 6, we add fixed effects for the article category (e.g. mergers and acquisitions), the relevance score (from 90 to 100) and the hour during the day in which the article was released as well as additional controls: the absolute return, turnover, and volatility each for industry and market from t-1 to t+5 seconds around the article. In regression 2 and 4, we also include those values for t-1 to t+120 seconds around the article. All variables are defined in Appendix 1. All standard errors are two-way clustered by stock and date. T-statistics are below the parameter estimates in parenthesis; ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Alternative Placebo Test – Pre-RavenPack “live”, excluding the Financial Crisis

Dependent Variable:	Speed of Stock Price Response (in %)		Speed of Trade Volume Response (in %)		Return t-1, t+5 (in bp)	
	(1)	(2)	(3)	(4)	(5)	(6)
RavenPack Release * D(HRH)					0.065 (0.62)	0.100 (0.93)
D(HRH)	-0.039 (-0.13)	0.004 (0.01)	0.013 (0.08)	0.028 (0.18)	0.235** (2.18)	0.212* (1.92)
Sentiment Direction					0.383*** (3.83)	0.108 (1.04)
Absolute Composite Sentiment Score		-0.032** (-2.11)		-0.013* (-1.68)		
Neutral Composite Sentiment Score		-0.384*** (-3.50)		-0.050 (-0.83)		
Absolute Event Sentiment Score		0.010 (0.77)		0.011 (1.44)		
Neutral Event Sentiment Score		-1.087** (-2.42)		-0.558** (-2.32)		
Article category identified		-12.772*** (-9.79)		-1.544 (-0.98)		0.514 (1.47)
Time since last article		0.065** (2.26)		0.091*** (5.33)		0.275*** (13.43)
Number of firms in article		-0.065 (-1.03)		-0.120*** (-3.88)		-0.198*** (-7.60)
Number of Observations	317859	317859	332007	332007	386460	386460
R ²	0.030	0.043	0.028	0.037	0.069	0.077
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes	No	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Market control variables	No	Yes	No	Yes	No	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Alternative Placebo Test – Pre-RavenPack “live”, excluding pre Regulation NMS period

Dependent Variable:	Speed of Stock Price Response (in %)		Speed of Trade Volume Response (in %)		Return t-1, t+5 (in bp)	
	(1)	(2)	(3)	(4)	(5)	(6)
RavenPack Release * D(HRH)					0.144 (0.50)	0.164 (0.57)
D(HRH)	0.349 (0.55)	0.047 (0.07)	0.337 (1.33)	0.144 (0.55)	-0.086 (-0.33)	-0.096 (-0.36)
Sentiment Direction					0.502* (1.74)	0.338 (1.18)
Absolute Composite Sentiment Score		-0.048* (-1.95)		-0.030*** (-2.80)		
Neutral Composite Sentiment Score		-0.408** (-2.34)		-0.162* (-1.87)		
Absolute Event Sentiment Score		0.060*** (2.67)		0.055*** (4.85)		
Neutral Event Sentiment Score		-1.976*** (-2.78)		-0.234 (-0.66)		
Article category identified		4.964 (0.45)		-0.696 (-0.26)		-0.628 (-0.51)
Time since last article		0.091* (1.95)		0.082*** (3.31)		0.111*** (4.41)
Number of firms in article		-0.739*** (-6.76)		-0.449*** (-9.83)		-0.201*** (-4.20)
Number of Observations	122751	122751	128009	128009	142729	142729
R ²	0.058	0.092	0.057	0.083	0.080	0.084
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes	No	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Market control variables	No	Yes	No	Yes	No	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Old RavenPack Definition: RavenPack 1.0 versus RavenPack 2.0

Dependent Variable:	Speed of Stock Price Response (in %)		Speed of Trade Volume Response (in %)		Return t-1, t+5 (in bp)	
	(1)	(2)	(3)	(4)	(5)	(6)
RavenPack Release * D(HRH)					0.720*** (3.74)	0.744*** (3.92)
D(HRH)	1.176** (2.17)	1.194** (2.29)	0.728*** (2.70)	0.622** (2.32)	0.114 (0.73)	0.114 (0.71)
Sentiment Direction					0.031 (0.16)	-0.123 (-0.65)
Absolute Composite Sentiment Score		0.046* (1.86)		0.018 (1.46)		
Neutral Composite Sentiment Score		-0.110 (-0.64)		-0.062 (-0.68)		
Absolute Event Sentiment Score		0.094*** (4.58)		0.049*** (4.17)		
Neutral Event Sentiment Score		-0.956 (-1.35)		-1.389*** (-3.31)		
Article category identified		-3.758 (-1.40)		-4.385*** (-3.39)		0.815 (1.47)
Time since last article		0.151*** (3.08)		0.149*** (6.03)		0.092*** (4.74)
Number of firms in article		-0.147 (-1.27)		-0.231*** (-4.33)		-0.175*** (-4.10)
Number of Observations	123368	123368	137379	137379	160228	160228
R ²	0.048	0.094	0.050	0.079	0.086	0.093
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes	No	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Market control variables	No	Yes	No	Yes	No	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes	Yes

Panel D: Number of firms fixed effects (excluding articles with more than 3 firms)

Dependent Variable:	Speed of Stock Price Response (in %)		Speed of Trade Volume Response (in %)		Return t-1, t+5 (in bp)	
	(1)	(2)	(3)	(4)	(5)	(6)
RavenPack Release * D(HRH)					0.346** (2.24)	0.407*** (2.65)
D(HRH)	1.353*** (2.75)	1.191** (2.50)	0.576** (2.32)	0.470* (1.91)	0.266** (2.21)	0.231* (1.84)
Sentiment Direction					0.222 (1.46)	0.066 (0.43)
Absolute Composite Sentiment Score		-0.002 (-0.14)		-0.009 (-1.00)		
Neutral Composite Sentiment Score		-0.200* (-1.72)		-0.197*** (-2.86)		
Absolute Event Sentiment Score		0.088*** (4.69)		0.054*** (5.12)		
Neutral Event Sentiment Score		-1.294** (-2.19)		-1.165*** (-3.32)		
Article category identified		0.257 (0.05)		-4.253*** (-4.47)		1.053* (1.90)
Time since last article		0.094** (2.57)		0.091*** (4.47)		0.039*** (2.99)
Number of Observations	225579	225579	244897	244897	293280	293280
R ²	0.036	0.085	0.030	0.060	0.064	0.071
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes	No	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
"Number of firms mentioned" fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Market control variables	No	Yes	No	Yes	No	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes	Yes

Panel E: Controlling for the information environment

Dependent Variable:	Speed of Stock Price Response (in %)		Speed of Trade Volume Response (in %)		Return t-1, t+5 (in bp)	
	(1)	(2)	(3)	(4)	(5)	(6)
RavenPack Release * D(HRH)					0.405*** (3.04)	0.449*** (3.38)
D(HRH)	1.432*** (3.31)	1.294*** (3.09)	0.628*** (2.93)	0.543** (2.56)	0.165 (1.62)	0.129*** (17.05)
Sentiment Direction					0.122 (0.94)	-0.006 (-0.04)
Absolute Composite Sentiment Score		-0.000 (-0.02)		-0.006 (-0.73)		
Neutral Composite Sentiment Score		-0.120 (-1.07)		-0.166** (-2.55)		
Absolute Event Sentiment Score		0.090*** (4.88)		0.056*** (5.50)		
Neutral Event Sentiment Score		-1.002* (-1.73)		-1.038*** (-3.08)		
Article category identified		1.318 (0.26)		-3.995*** (-3.46)		0.935* (1.95)
Time since last article		0.049 (1.08)		0.094*** (3.50)		0.045*** (2.78)
Number of firms in article		-2.36e+07 (-0.00)		7.15e+06 (0.00)		-6.04e+05 (-0.00)
D(article in last hour)	0.105 (0.68)	-0.081 (-0.46)	-0.157** (-2.33)	0.007 (0.09)	-0.116** (-2.38)	-0.026 (-0.44)
D(article earlier in the day),	-1.010*** (-6.94)	-0.242* (-1.65)	-0.205*** (-3.01)	-0.068 (-0.94)	-0.057 (-1.21)	0.051 (1.00)
D(article during prior trading day)	0.121 (0.75)	0.054 (0.34)	0.078 (1.10)	0.035 (0.51)	0.050 (1.09)	0.039 (0.85)
log(number of articles in last week)	-0.145* (-1.67)	-0.058 (-0.69)	-0.065 (-1.56)	-0.027 (-0.65)	-0.013 (-0.47)	-0.005 (-0.17)
Number of Observations	248835	248835	272005	272005	321749	321749
R ²	0.035	0.084	0.028	0.058	0.061	0.067
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes	No	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Market control variables	No	Yes	No	Yes	No	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes	Yes

IA-Table 6: Alternative Length of Event Window

This table contains the results of robustness check to Tables 4, 5 and 6 using a different lengths for short and long term reactions. We estimate the various specification during the time in which RavenPack was “live” (April 1, 2009 – September 10, 2012). Panel A provides a robustness check to Table 4 and thus the dependent variable is *Speed of Stock Price Response* (in percent). In the main specification, this variable is defined as $\frac{\text{Abs}(\text{Return } t-1, t+5)}{\text{Abs}(\text{Return } t-1, t+5)+\text{Abs}(\text{Return } t+6, t+120)}$. In Regressions 1 and 2 we instead define it as $\frac{\text{Abs}(\text{Return } t-1, t+10)}{\text{Abs}(\text{Return } t-1, t+10)+\text{Abs}(\text{Return } t+11, t+120)}$. In Regressions 3 and 4 as $\frac{\text{Abs}(\text{Return } t-1, t+5)}{\text{Abs}(\text{Return } t-1, t+5)}$ and in Regressions 5 and 6 as $\frac{\text{Abs}(\text{Return } t-1, t+10)}{\text{Abs}(\text{Return } t-1, t+10)+\text{Abs}(\text{Return } t+11, t+300)}$. Panel B provides a robustness check to Table 6 and thus the dependent variable is *Speed of Trade Volume Response* (in percent). In the main specification, this variable is defined as $\frac{\text{Turnover } t-1, t+5}{\text{Turnover } t-1, t+120}$. In Regressions 1 and 2 we instead define it as $\frac{\text{Turnover } t-1, t+10}{\text{Turnover } t-1, t+120}$. In Regressions 3 and 4 as $\frac{\text{Turnover } t-1, t+5}{\text{Turnover } t-1, t+300}$ and in Regressions 5 and 6 as $\frac{\text{Turnover } t-1, t+10}{\text{Turnover } t-1, t+300}$. Panel C provides a robustness check to Table 5. In Table 5, we examine how well the sentiment direction of an article predicts the 5-second return reaction to an article depending on whether the article is covered in RavenPack. In Panel C, we use the 10-second return reaction instead. Whenever market control variables is indicated as “Yes”, we include as additional controls: the absolute return, turnover, and volatility each for industry and market for the respective horizons used as dependent variables. All variables are defined in Appendix 1. All standard errors are two-way clustered by stock and date. T-statistics are below the parameter estimates in parenthesis; ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Speed of Stock Price Response (in percent)

Window Length:	10 sec/120 sec		5 sec/300 sec		10 sec/300 sec	
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH)	1.906*** (3.74)	1.797*** (3.57)	1.281*** (3.99)	1.184*** (3.80)	1.733*** (4.35)	1.671*** (4.28)
Absolute Composite Sentiment Score		-0.018 (-1.00)		-0.008 (-0.68)		-0.022 (-1.50)
Neutral Composite Sentiment Score		-0.201 (-1.51)		-0.112 (-1.34)		-0.207** (-2.03)
Article category identified		-5.306 (-0.88)		-1.583 (-0.33)		-7.591 (-1.59)
Absolute Event Sentiment Score		0.106*** (5.16)		0.083*** (5.72)		0.100*** (5.99)
Neutral Event Sentiment Score		-0.449 (-0.63)		-1.052** (-2.17)		-0.833 (-1.42)
Time since last article		0.123*** (3.09)		0.091*** (3.63)		0.106*** (3.61)
Number of firms in article		0.138 (1.43)		0.031 (0.47)		0.097 (1.24)
Number of Observations	248848	248848	279486	279486	279485	279485
R ²	0.033	0.083	0.036	0.082	0.038	0.087
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes	No	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Market control variables	No	Yes	No	Yes	No	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Speed of Trade Volume Response (in percent)

Window Length:	10 sec/120 sec		5 sec/300 sec		10 sec/300 sec	
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH)	0.754** (2.54)	0.603** (2.05)	0.336*** (3.13)	0.256** (2.37)	0.511*** (3.37)	0.418*** (2.78)
Absolute Composite Sentiment Score		-0.023** (-2.28)		-0.004 (-0.94)		-0.014** (-2.36)
Neutral Composite Sentiment Score		-0.337*** (-3.98)		-0.114*** (-3.12)		-0.232*** (-4.79)
Article category identified		-1.555 (-0.40)		-2.014*** (-3.80)		-0.283 (-0.11)
Absolute Event Sentiment Score		0.073*** (6.04)		0.044*** (6.86)		0.062*** (7.84)
Neutral Event Sentiment Score		-1.047** (-2.46)		-0.606*** (-2.97)		-0.569** (-2.22)
Time since last article		0.133*** (5.15)		0.062*** (5.94)		0.084*** (6.22)
Number of firms in article		-0.153*** (-2.95)		-0.075*** (-3.51)		-0.119*** (-4.29)
Number of Observations	272019	272019	293629	293629	293629	293629
R ²	0.029	0.063	0.032	0.054	0.035	0.060
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes	No	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Market control variables	No	Yes	No	Yes	No	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Directional Stock Price Response to Article Sentiment (in basis points)

Dependent Variable:	Return t-1, t+10		
	(1)	(2)	(3)
D(HRH) * Sentiment Direction	0.418** (2.43)	0.480*** (2.80)	0.487*** (2.84)
D(HRH)	0.333** (2.03)	0.221 (1.34)	0.229 (1.38)
Sentiment Direction	0.297* (1.69)	0.154 (0.87)	0.149 (0.84)
Article category identified		0.949* (1.81)	0.773* (1.72)
Time since last article		0.077*** (4.86)	0.077*** (4.88)
Number of firms in article		-0.208*** (-5.57)	-0.204*** (-5.47)
Number of Observations	321762	321762	321762
R ²	0.064	0.067	0.068
Relevance, Category and Hour Fixed Effects	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes
Market control variables	No	No	Yes
Firm specific control variables	Yes	Yes	Yes

Internet Appendix 1: Intraday Market and Industry Returns

We compute second-by-second value-weighted average returns, trading volume, and value weighted average volatility for the market and for 12 industry indices (as defined by Fama and French).¹ In constructing these indices, we use information from the CRSP daily file, the TAQ National Best Bid and Offer (NBBO) file provided by WRDS for second-by-second quotes and the TAQ trades file. We link TAQ to CRSP using ticker symbols. We include in our sample all stocks that are covered in CRSP and TAQ and have share codes of 10 or 11 in CRSP. We assign stocks to industry indexes using CRSP SIC codes (data item SICCD) with lists obtained from Ken French's website. At the quote and trade level we apply the following filters: We exclude all trades with zero size, negative prices, TAQ Correction Code not equal to 0, and bid-ask quotes where the bid is above the ask. In addition, we exclude all quotes where the bid-ask spread is larger than 30%.

Most stocks do not have quotes available for every second. Some stocks are relatively illiquid and only have valid quotes every few minutes. To be able to compute the first return of the day, we need past quotes. The closing quotes of the prior day are problematic in that (1) they often are not prices at which market makers would actually be willing to trade, and (2) they are informationally "stale" as they do not incorporate information released overnight. Therefore, we use the time from 9:00 to 9:35 as a burn-in period and use the last valid bid-ask midquote of this time period as the initial price to compute the first return. We exclude from the sample for that specific day all stocks that do not have a quote in this time period. We also exclude stocks for which the midpoint of the initial quote is below \$1 and for which this initial quote has a bid ask spread of more than 10%.² This way we insure that our index is not driven by outliers due to large bid-ask spreads.

We compute value-weighted average returns for the market and the 12 Fama French industry indices by computing the second-to-second change in aggregate market capitalization for the respective samples. We compute a company's market capitalization by multiplying the bid-ask midpoint by the shares outstanding from CRSP.³ We use bid-ask midpoints rather than transaction prices to avoid bid-ask bounce. We compute aggregate trading volume per second by summing the individual stock dollar trading volume per second for all stocks in the respective samples. A stock's trading volume is equal to number of shares traded during the second multiplied by the transaction prices of the trades. We compute value-weighted

¹ Thanks to the technical personnel at WRDS, especially Mark Keintz, for making the construction of these indexes possible. The composition of the industry indexes are from Ken French's Website.

² The difference between the cut-off for the initial spread (10%) and the general spread cut-off (30%) is intended. We only want to include stocks for which a typical spread is below 10% and for these stocks we treat any quote with a spread above 30% as an outlier that needs to be removed.

³ Since the index composition changes day to day, we are not able to compute an overnight return. This is no problem as we are only interested in intra-day returns.

average volatility for the market and for the 12 Fama French industries based on squared second-by-second returns. The value weights are based on the firm's market capitalization at the end of the prior day using the closing price and shares outstanding in CRSP. Individual stock returns used to compute value-weighted average volatility are based on the second-by-second change in bid-ask midpoints. If there is no quote for a second, the return is set to 0. If the return is larger than 10%, it is set to 10%. We verify that all our filters affect only a small number of firms or quotes.

Internet Appendix 2: Examples of HRL and LRH articles

Below, we give examples of articles where different RavenPack versions disagree. We report the name of the company that the article is associated with, date and time of the article and the *Relevance*, *Sentiment Direction* and *Category* information both in the Old RavenPack and in New RavenPack. We also report the stock price response in seconds around the article as well as the article's headline and body.

We provide two examples of HRL articles. Example A constitutes an article that was assigned to Associated Bank in both versions, but while New RavenPack assigned the maximum relevance of 100, Old RavenPack only assigned a lower Relevance of 61. This difference comes from the fact that New RavenPack correctly identifies this article as a positive earnings release while Old RavenPack cannot determine its category. However, both versions agree on the article being positive. The stock price reaction to this article is slow. There is no price update in the first 8 seconds after the article and most of the stock price response happens after about 60 seconds.

Example B constitutes a different type of HRL article, where the versions disagree about identifying the company. New RavenPack assigns this article to Internet Capital Group, while Old RavenPack did not realize that this article is about this company. The article is a buyback announcement, which is both relevant and positive news to the company. Accordingly, New RavenPack gives it a high *Relevance* and a positive *Sentiment Direction*. In the stock price reaction we can see that the information is only slowly incorporated into prices and that there is not stock price response until about 30 seconds after the article.

As comparison, we present an HRH article in Example C. This article is a buyback announcement for Genzyme Corporation. In both RavenPack versions it is identified as a relevant and positive article for this company. A large part of the stock price reaction takes place in the first 5 seconds after the article.

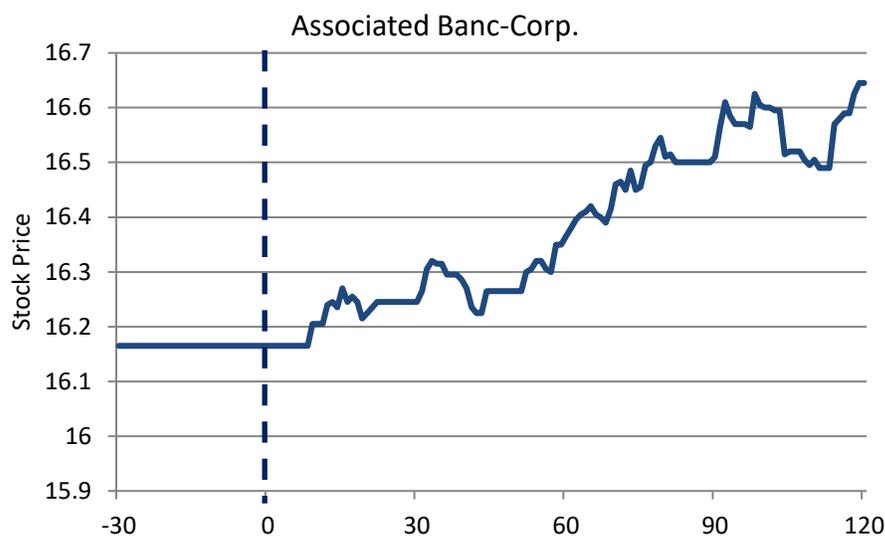
Example D constitutes an LRH article. Both RavenPack versions assign this article to Netsuite. However, they disagree about the relevance. While Old RavenPack assigns it a high *Relevance* of 96, New RavenPack assigns only a 20. Reading the article, we realize that this story is mainly about another company (Suite Cloud) and that this story seems not very relevant to Netsuite. Still, we see an immediate stock price reaction of Netsuite, which is partially corrected after 30 seconds.

A. High-relevance article Released as Low-relevance article (HRL) – Example One

Company: ASSOCIATED BANC-CORP.

Date and Time: 13:18:03 on April 16, 2009

	Relevance Score	Sentiment Direction	Category
Old RavenPack	61	Positive	N/A
New RavenPack	100	Positive	earnings-per-share-positive



Headline: PRESS RELEASE: Associated Reports First Quarter Earnings of \$0.28 Per Common Share, Up from \$0.11 for the Fourth Quarter of 2008

Article body:

GREEN BAY, Wis.--(BUSINESS WIRE)--April 16, 2009--

Associated Banc-Corp (NASDAQ: ASBC):

-- Net income available to common shareholders was \$35.4 million for the first quarter compared to \$13.6 million for the fourth quarter of 2008

-- Net interest income for the quarter was \$189.3 million compared to \$191.8 million for the fourth quarter of 2008

-- Total deposits grew by 4.7% to \$15.9 billion at March 31, 2009 compared to \$15.2 billion at December 31, 2008 and were up 14.3% from \$13.9 billion at March 31, 2008

-- Mortgage loans originated for sale exceeded \$1 billion during the quarter

-- Provision for loan losses of \$105.4 million exceeded net charge offs of \$57.6 million by \$47.8 million, increasing allowance for loan losses to 1.97% of loans at March 31, 2009, up from 1.63% at December 31, 2008

-- Tangible common equity ratio remained stable at 6.10%

-- Quarterly dividend reduced to \$0.05 per common share to preserve capital

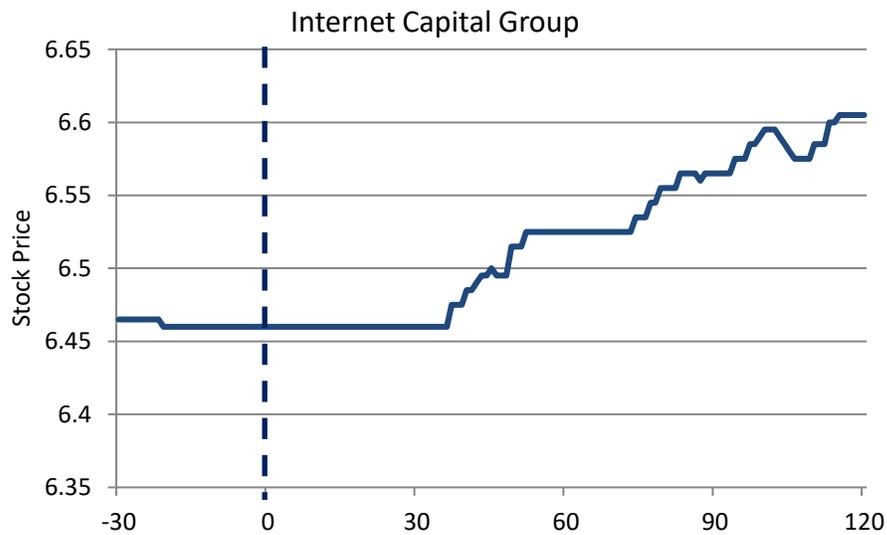
(article continues for several pages and is cut here)

B. High-relevance article Released as Low-relevance article (HRL) – Example Two

Company: INTERNET CAPITAL GROUP INC.

Date and Time: 14:22:29 on January 7, 2010

	Relevance Score	Sentiment Direction	Category
Old RavenPack	N/A	N/A	N/A
New RavenPack	100	Positive	buybacks



Headline: *DJ Internet Cap Grp Repurchased 400,000 Shrs In Qtr Ended Dec 31

Article body:

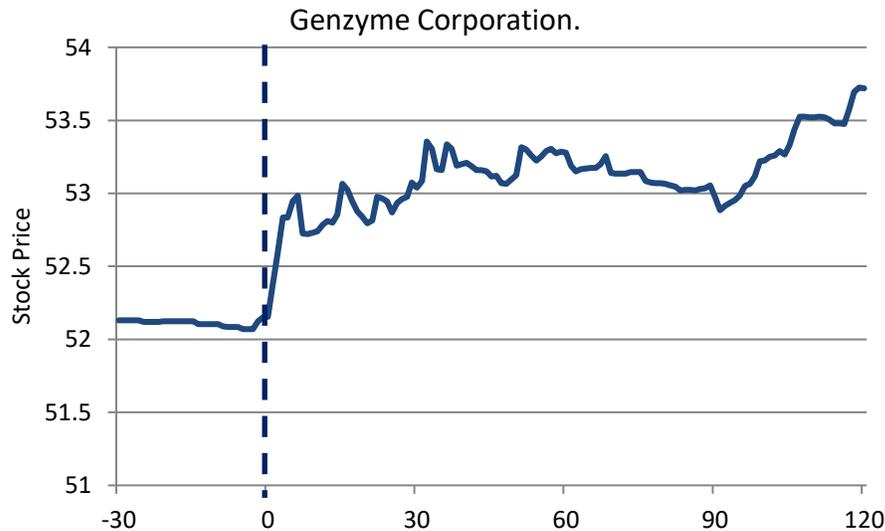
(MORE TO FOLLOW) Dow Jones Newswires (212-416-2400)

C. High-relevance article Released as High-relevance article (HRH)

Company: GENZYME CORPORATION

Date and Time: 13:15:02 on May 6, 2010

	Relevance Score	Sentiment Direction	Category
Old RavenPack	100	Positive	buybacks
New RavenPack	100	Positive	buybacks



Headline: * PRESS RELEASE: Genzyme Announces \$2 Billion Stock Repurchase

Article body:

Company Will Explore Strategic Alternatives for Three Businesses

New Initiatives Part of Plan for Growth Through 2015

CAMBRIDGE, Mass.--(BUSINESS WIRE)--May 06, 2010--

Genzyme Corp. (NASDAQ: GENZ) today announced that its Board of Directors has voted to pursue several actions to increase shareholder value. The company will initiate a \$2 billion stock buyback, under which \$1 billion of stock will be repurchased in the near term and financed with debt. The additional \$1 billion of stock will be repurchased during the next 12 months.

The company also plans to pursue strategic alternatives for its Genetic testing, Diagnostic products and Pharmaceutical intermediates businesses. Options could include divestiture, spin-out, or management buy-out.

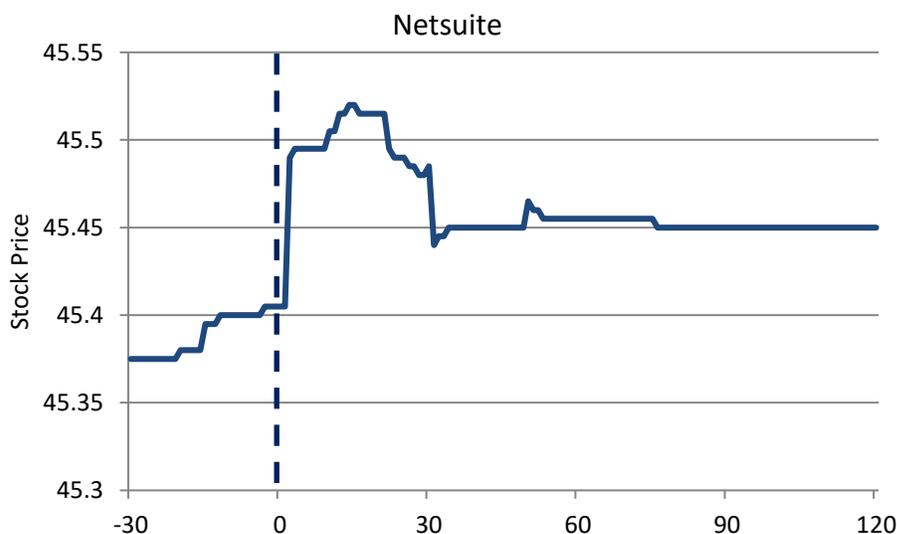
(article continues for several pages and is cut here)

D. Low-relevance article Released as High-relevance article (LRH)

Company: NETSUITE INC.

Date and Time: 10:28:15 on May 23, 2012

	Relevance Score	Sentiment Direction	Category
Old RavenPack	96	Positive	N/A
New RavenPack	20	Positive	N/A



Headline: PRESS RELEASE: SPS Commerce Named SuiteCloud Developer Network Partner of the Year by NetSuite

Article body:

MINNEAPOLIS, May 23, 2012 (GLOBE NEWSWIRE) -- SPS Commerce (Nasdaq:SPSC), a leading provider of on-demand supply chain management solutions, today announced that it has been named NetSuite's SuiteCloud Developer Network Partner for 2012. This award was given to SPS Commerce at SuiteWorld 2012 in San Francisco.

"We are honored to be recognized with this distinguished honor by NetSuite," said Archie Black, CEO of SPS Commerce. "Our companies have worked together since 2007 to bring cloud-based solutions to companies across the globe. Our joint customers are leveraging integrated solutions to advance their e-commerce, retail and logistics operations. We would like to congratulate our partners, Celigo, Retail Anywhere and Forward Hindsight, which also received awards from NetSuite at SuiteWorld."

Pre-wired to integrate directly with NetSuite, SPS Commerce's cloud-based supply chain services improve the way suppliers, retailers, distributors and 3PLs build their trading partner relationships and manage and fulfill orders with pre-built integrations using 3,000 order management models across 1,500 retailers, grocers and distributors. SPS' Retail Universe, a social network for the supply chain, is designed to help the community's 40,000 members form new business partnerships based on product or integration requirements.

Internet Appendix 3: Extended versions of tables in the paper

The following pages contain extended versions of the tables in the paper. Tables are numbered so that their numbers correspond to the ones in the paper. All variables are defined in Appendix 1 in the paper.

Paper Table 3: Overreaction to News Analytics (LRH articles)

This table contains the extended version of Table 3 in the paper (all control variables are reported).

Dependent Variable:	Return t-1, t+5 (in bp)			Return t+6, t+120 (in bp)		
	(1)	(2)	(3)	(4)	(5)	(6)
RavenPack Release * Sentiment Direction	0.465** (2.29)	0.533** (2.46)	0.563*** (2.60)	-0.602 (-1.00)	-0.666 (-1.09)	-0.660 (-1.10)
RavenPack Release	-0.252 (-1.48)	-0.258 (-1.43)	-0.309 (-1.60)	-1.739*** (-3.88)	-1.659*** (-3.67)	-1.643*** (-3.36)
Sentiment Direction	0.258** (2.31)	0.098 (0.82)	0.099 (0.83)	1.532*** (4.96)	1.517*** (4.41)	1.538*** (4.49)
Company size	-0.313** (-2.33)	-0.291** (-2.23)	-0.273** (-2.07)	-1.486*** (-4.37)	-1.284*** (-3.85)	-1.233*** (-3.68)
Return prior month	16.657 (0.91)	17.202 (0.94)	26.384 (1.42)	-65.596 (-1.21)	-73.395 (-1.37)	-78.320 (-1.43)
Volatility prior month	0.005 (0.93)	0.005 (0.97)	-0.005 (-0.76)	0.009 (0.38)	0.011 (0.45)	0.010 (0.40)
Turnover prior month	-0.049 (-0.51)	-0.053 (-0.55)	-0.068 (-0.71)	0.086 (0.39)	0.105 (0.46)	0.018 (0.08)
Illiquidity prior month	-0.010 (-1.18)	-0.010 (-1.26)	-0.008 (-0.92)	-0.061*** (-2.88)	-0.063*** (-2.93)	-0.060*** (-2.73)
Article category identified		-1.177*** (-3.14)	-1.217*** (-3.05)		0.043 (0.04)	-0.316 (-0.26)
Time since last article		0.112** (2.41)	0.107** (2.31)		0.373*** (2.97)	0.357*** (2.83)
Number of firms in article		-0.179** (-2.15)	-0.171** (-2.08)		-0.397* (-1.68)	-0.415* (-1.78)
Absolute market return t-1, t+5			-0.004 (-0.02)			-1.495** (-2.37)
Absolute industry return t-1, t+5			-0.278 (-1.14)			1.153** (2.08)
Market turnover t-1, t+5			-1.547 (-0.10)			91.797 (1.47)
Industry turnover t-1, t+5			10.289 (1.04)			23.893 (0.92)
Market volatility t-1, t+5			-0.263 (-1.54)			0.294 (0.61)
Industry volatility t-1, t+5			0.471** (2.14)			-0.565 (-1.61)
Absolute market return t-1, t+120						-0.342*** (-3.35)
Absolute industry return t-1, t+120						0.250*** (3.18)
Market turnover t-1, t+120						-7.960** (-2.30)
Industry turnover t-1, t+120						3.069 (1.31)
Market volatility t-1, t+120						0.275 (0.51)
Industry volatility t-1, t+120						0.128 (0.35)
Number of Observations	20588	20586	20586	20588	20586	20586
R ²	0.003	0.008	0.014	0.007	0.013	0.018
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes

Paper Table 4: Speed of Stock Price Response to News Articles

This table contains the extended version of Table 4 in the paper (all control variables are reported). In Panel A, we based Speed of Stock Price Response on raw returns (as in the paper). In Panel B, Speed of Stock Price Response is based on market adjusted returns. In Panel C, it is based on industry adjusted returns.

Panel A: Raw Returns (as in the paper)

Dependent Variable:	Speed of Stock Price Response (in %)					
	Main Test - RavenPack is "live"			Placebo Test - Before RavenPack is "live"		
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH)	1.469*** (3.39)	1.333*** (3.06)	1.321*** (3.17)	-0.048 (-0.17)	-0.058 (-0.20)	-0.012 (-0.04)
Company size	1.490*** (5.27)	1.541*** (5.37)	1.633*** (5.75)	1.049*** (6.64)	1.097*** (6.96)	1.137*** (7.23)
Return prior month	-4.146 (-0.37)	-1.561 (-0.14)	1.608 (0.15)	-12.231* (-1.71)	-10.153 (-1.43)	-9.517 (-1.33)
Volatility prior month	0.000 (0.02)	-0.000 (-0.08)	-0.003 (-0.64)	0.000 (0.14)	0.001 (0.18)	-0.002 (-0.56)
Turnover prior month	0.351*** (3.04)	0.378*** (3.21)	0.401*** (3.50)	0.206*** (3.11)	0.214*** (3.25)	0.202*** (3.07)
Illiquidity prior month	0.010 (1.00)	0.013 (1.20)	0.013 (1.28)	-0.030*** (-3.84)	-0.029*** (-3.64)	-0.027*** (-3.56)
Absolute Composite Sentiment Score		-0.004 (-0.23)	-0.002 (-0.12)		-0.032** (-2.35)	-0.032** (-2.38)
Neutral Composite Sentiment Score		-0.107 (-0.91)	-0.115 (-1.02)		-0.338*** (-3.44)	-0.357*** (-3.67)
Article category identified		0.522 (0.10)	1.394 (0.28)		-3.575 (-0.57)	-4.142 (-0.71)
Absolute Event Sentiment Score		0.098*** (5.20)	0.089*** (4.86)		0.021* (1.73)	0.022* (1.88)
Neutral Event Sentiment Score		-0.818 (-1.35)	-0.958* (-1.65)		-1.202*** (-2.99)	-1.150*** (-2.89)
Time since last article		0.099*** (2.78)	0.086** (2.46)		0.069*** (2.67)	0.062** (2.40)
Number of firms in article		-0.061 (-0.67)	-0.058 (-0.67)		-0.149*** (-2.59)	-0.170*** (-2.99)
Absolute market return t-1, t+120			-0.141*** (-6.42)			-0.054*** (-3.03)
Absolute market return t-1, t+5			1.116*** (4.50)			0.562*** (4.16)
Absolute industry return t-1, t+120			-0.257*** (-10.89)			-0.194*** (-11.24)
Absolute industry return t-1, t+5			1.915*** (9.09)			1.053*** (7.30)
Market turnover t-1, t+120			-3.920*** (-4.67)			-5.436*** (-7.81)
Market turnover t-1, t+5			110.015*** (8.56)			138.785*** (15.03)
Industry turnover t-1, t+120			-1.525*** (-2.94)			-0.195 (-0.52)
Industry turnover t-1, t+5			38.208*** (3.98)			23.464*** (5.62)
Market volatility t-1, t+120			0.204 (1.34)			0.126* (1.83)
Market volatility t-1, t+5			-0.555*** (-4.45)			-0.221*** (-3.85)
Industry volatility t-1, t+120			-0.394*** (-3.67)			-0.301*** (-6.28)
Industry volatility t-1, t+5			0.749*** (7.72)			0.545*** (11.46)
Number of Observations	248849	248849	248849	400158	400158	400158
R ²	0.034	0.038	0.084	0.032	0.033	0.048
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Market Adjusted Returns

Dependent Variable:	Speed of Stock Price Response – Market Adjusted (in %)					
	Main Test - RavenPack is “live”			Placebo Test - Before RavenPack is “live”		
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH)	0.972** (2.44)	0.769** (1.98)	0.755** (2.00)	0.114 (0.42)	0.002 (0.01)	0.042 (0.15)
Company size	1.590*** (6.12)	1.660*** (6.31)	1.772*** (6.91)	1.148*** (8.00)	1.174*** (8.19)	1.221*** (8.62)
Return prior month	3.740 (0.36)	6.080 (0.58)	7.638 (0.75)	6.115 (0.89)	6.187 (0.91)	4.999 (0.74)
Volatility prior month	-0.004 (-0.83)	-0.004 (-0.78)	-0.006 (-1.17)	-0.009*** (-2.76)	-0.008*** (-2.63)	-0.008** (-2.49)
Turnover prior month	0.202** (2.05)	0.232** (2.31)	0.272*** (2.80)	0.022 (0.36)	0.035 (0.57)	0.028 (0.45)
Illiquidity prior month	0.006 (0.59)	0.007 (0.77)	0.008 (0.89)	-0.027*** (-4.03)	-0.026*** (-3.88)	-0.024*** (-3.59)
Absolute Composite Sentiment Score		-0.008 (-0.55)	-0.007 (-0.46)		-0.032** (-2.50)	-0.032** (-2.56)
Neutral Composite Sentiment Score		-0.046 (-0.39)	-0.052 (-0.47)		-0.200** (-2.11)	-0.223** (-2.38)
Article category identified		-5.275 (-1.18)	-4.500 (-0.91)		-8.814** (-2.42)	-9.180*** (-2.61)
Absolute Event Sentiment Score		0.074*** (4.14)	0.066*** (3.77)		0.002 (0.17)	0.005 (0.42)
Neutral Event Sentiment Score		-0.045 (-0.08)	-0.240 (-0.44)		-1.051*** (-2.83)	-0.948** (-2.57)
Time since last article		0.192*** (5.89)	0.176*** (5.57)		0.103*** (4.26)	0.090*** (3.78)
Number of firms in article		-0.260*** (-3.10)	-0.269*** (-3.35)		-0.172*** (-3.08)	-0.196*** (-3.61)
Absolute market return t-1, t+120			-0.180*** (-7.99)			-0.096*** (-5.28)
Absolute market return t-1, t+5			4.256*** (13.81)			2.951*** (13.78)
Absolute industry return t-1, t+120			-0.070*** (-3.31)			-0.071*** (-4.37)
Absolute industry return t-1, t+5			-0.149 (-0.92)			0.026 (0.25)
Market turnover t-1, t+120			-2.509*** (-2.78)			-5.546*** (-6.64)
Market turnover t-1, t+5			131.423*** (8.71)			176.666*** (14.50)
Industry turnover t-1, t+120			-2.946*** (-5.79)			-0.908** (-2.53)
Industry turnover t-1, t+5			39.897*** (4.25)			17.510*** (4.16)
Market volatility t-1, t+120			0.130 (0.74)			0.113* (1.68)
Market volatility t-1, t+5			-1.408*** (-8.76)			-0.522*** (-7.58)
Industry volatility t-1, t+120			-0.291*** (-2.94)			-0.363*** (-7.89)
Industry volatility t-1, t+5			0.855*** (9.59)			0.493*** (11.63)
Number of Observations	248849	248849	248849	400158	400158	400158
R ²	0.039	0.043	0.099	0.037	0.038	0.064
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Industry Adjusted Returns

Dependent Variable:	Speed of Stock Price Response – Industry Adjusted (in %)					
	Main Test - RavenPack is “live”			Placebo Test - Before RavenPack is “live”		
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH)	0.961** (2.28)	0.779* (1.88)	0.802** (2.01)	0.280 (1.01)	0.166 (0.60)	0.205 (0.74)
Company size	1.685*** (6.13)	1.750*** (6.26)	1.854*** (6.81)	1.237*** (9.02)	1.261*** (9.21)	1.263*** (9.41)
Return prior month	-9.784 (-0.93)	-7.866 (-0.75)	-1.918 (-0.19)	-1.421 (-0.21)	-1.630 (-0.24)	0.738 (0.11)
Volatility prior month	-0.001 (-0.22)	-0.001 (-0.13)	-0.005 (-1.01)	-0.002 (-0.65)	-0.002 (-0.50)	-0.005* (-1.68)
Turnover prior month	0.238** (2.28)	0.267** (2.51)	0.296*** (2.84)	0.010 (0.16)	0.024 (0.40)	0.004 (0.06)
Illiquidity prior month	0.014 (1.43)	0.016 (1.60)	0.016* (1.67)	-0.024*** (-3.54)	-0.023*** (-3.42)	-0.022*** (-3.43)
Absolute Composite Sentiment Score		-0.006 (-0.36)	-0.002 (-0.13)		-0.036*** (-2.79)	-0.037*** (-2.96)
Neutral Composite Sentiment Score		0.045 (0.40)	0.053 (0.48)		-0.218** (-2.27)	-0.240** (-2.53)
Article category identified		2.941 (0.45)	3.755 (0.56)		-9.904*** (-3.24)	-11.754*** (-3.17)
Absolute Event Sentiment Score		0.073*** (4.06)	0.064*** (3.64)		0.005 (0.46)	0.006 (0.57)
Neutral Event Sentiment Score		0.332 (0.55)	0.225 (0.39)		-0.745** (-1.97)	-0.742** (-1.98)
Time since last article		0.188*** (5.95)	0.170*** (5.63)		0.107*** (4.48)	0.098*** (4.15)
Number of firms in article		-0.287*** (-3.42)	-0.291*** (-3.63)		-0.117** (-2.21)	-0.149*** (-2.89)
Absolute market return t-1, t+120			-0.082*** (-3.78)			0.046*** (3.08)
Absolute market return t-1, t+5			0.075 (0.31)			-0.579*** (-4.45)
Absolute industry return t-1, t+120			-0.137*** (-6.48)			-0.207*** (-15.21)
Absolute industry return t-1, t+5			3.615*** (18.34)			3.134*** (16.50)
Market turnover t-1, t+120			-2.759*** (-3.27)			-5.515*** (-7.44)
Market turnover t-1, t+5			120.690*** (9.70)			152.538*** (14.42)
Industry turnover t-1, t+120			-3.304*** (-5.77)			-0.412 (-1.13)
Industry turnover t-1, t+5			49.634*** (4.91)			22.421*** (5.41)
Market volatility t-1, t+120			0.363** (2.32)			0.201*** (3.07)
Market volatility t-1, t+5			-1.065*** (-7.80)			-0.435*** (-7.42)
Industry volatility t-1, t+120			-0.454*** (-4.37)			-0.508*** (-11.02)
Industry volatility t-1, t+5			0.526*** (6.12)			0.458*** (9.61)
Number of Observations	248849	248849	248849	400158	400158	400158
R ²	0.040	0.043	0.098	0.037	0.038	0.066
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Paper Table 5: Directional Stock Price Response to Article Sentiment

This table contains the extended version of Table 5 in the paper (all control variables are reported). In Panel A, the dependent variable is raw return (as in the paper). In Panel B, it is market adjusted return. In Panel C, it is industry adjusted return.

Panel A: Raw Returns (as in the paper)

Dependent Variable:	Return t-1, t+5 (in bp)					
	Main Test - RavenPack is "live"			Placebo Test - Before RavenPack is "live"		
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH) * Sentiment Direction	0.407*** (3.06)	0.452*** (3.40)	0.452*** (3.41)	0.081 (0.79)	0.116 (1.10)	0.114 (1.09)
D(HRH)	0.187* (1.86)	0.125 (1.19)	0.125 (1.19)	0.137 (1.29)	0.103 (0.95)	0.102 (0.94)
Sentiment Direction	0.118 (0.91)	-0.010 (-0.08)	-0.009 (-0.07)	0.421*** (4.25)	0.184* (1.82)	0.187* (1.85)
Company size	-0.475*** (-4.42)	-0.507*** (-4.73)	-0.510*** (-4.74)	-0.343*** (-3.82)	-0.311*** (-3.48)	-0.296*** (-3.32)
Return prior month	-9.042* (-1.78)	-9.023* (-1.78)	-9.064* (-1.78)	-11.558** (-2.48)	-12.895*** (-2.78)	-11.893** (-2.55)
Volatility prior month	0.005 (1.59)	0.005 (1.61)	0.003 (1.03)	0.003 (1.13)	0.004* (1.65)	0.002 (0.81)
Turnover prior month	-0.026 (-0.58)	-0.024 (-0.53)	-0.033 (-0.73)	-0.019 (-0.46)	-0.003 (-0.07)	-0.010 (-0.24)
Illiquidity prior month	-0.005* (-1.78)	-0.005 (-1.54)	-0.005* (-1.77)	-0.004 (-1.19)	-0.004 (-1.17)	-0.005 (-1.35)
Article category identified		1.152** (2.06)	0.933* (1.96)		0.304 (0.81)	0.370 (0.97)
Time since last article		0.043*** (3.44)	0.043*** (3.47)		0.237*** (13.19)	0.239*** (13.26)
Number of firms in article		-0.150*** (-4.96)	-0.145*** (-4.80)		-0.221*** (-9.24)	-0.220*** (-9.18)
Absolute market return t-1, t+5			0.298*** (3.73)			0.193*** (2.82)
Absolute industry return t-1, t+5			-0.430*** (-4.89)			-0.243*** (-5.04)
Market turnover t-1, t+5			-8.558 (-1.42)			-3.021 (-0.70)
Industry turnover t-1, t+5			2.734 (0.89)			1.423 (0.95)
Market volatility t-1, t+5			-0.416*** (-6.24)			-0.197*** (-5.62)
Industry volatility t-1, t+5			0.592*** (7.02)			0.298*** (8.84)
Number of Observations	321762	321762	321762	481852	481852	481852
R ²	0.060	0.063	0.067	0.056	0.062	0.063
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Market Adjusted Returns

Dependent Variable:	Market adjusted return t-1, t+5 (in bp)					
	Main Test - RavenPack is "live"			Placebo Test - Before RavenPack is "live"		
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH) * Sentiment Direction	0.422*** (3.18)	0.465*** (3.50)	0.464*** (3.50)	0.092 (0.90)	0.128 (1.22)	0.127 (1.22)
D(HRH)	0.177* (1.75)	0.121 (1.15)	0.122 (1.16)	0.123 (1.17)	0.091 (0.84)	0.090 (0.83)
Sentiment Direction	0.101 (0.78)	-0.028 (-0.21)	-0.026 (-0.20)	0.405*** (4.11)	0.168* (1.67)	0.171* (1.70)
Company size	-0.470*** (-4.39)	-0.501*** (-4.69)	-0.504*** (-4.69)	-0.340*** (-3.79)	-0.309*** (-3.46)	-0.294*** (-3.30)
Return prior month	-9.275* (-1.83)	-9.282* (-1.84)	-9.293* (-1.84)	-11.967** (-2.55)	-13.280*** (-2.83)	-12.245*** (-2.60)
Volatility prior month	0.005 (1.63)	0.005* (1.65)	0.003 (1.07)	0.003 (1.29)	0.005* (1.80)	0.002 (0.95)
Turnover prior month	-0.022 (-0.49)	-0.020 (-0.45)	-0.029 (-0.65)	-0.026 (-0.62)	-0.010 (-0.23)	-0.017 (-0.40)
Illiquidity prior month	-0.005* (-1.77)	-0.005 (-1.54)	-0.005* (-1.76)	-0.004 (-1.18)	-0.004 (-1.16)	-0.005 (-1.35)
Article category identified		1.264** (2.32)	1.059** (2.25)		0.333 (0.91)	0.402 (1.05)
Time since last article		0.041*** (3.31)	0.041*** (3.33)		0.237*** (13.20)	0.239*** (13.29)
Number of firms in article		-0.144*** (-4.83)	-0.139*** (-4.68)		-0.220*** (-9.20)	-0.218*** (-9.11)
Absolute market return t-1, t+5			0.292*** (3.83)			0.143** (2.40)
Absolute industry return t-1, t+5			-0.403*** (-4.83)			-0.237*** (-5.10)
Market turnover t-1, t+5			-6.431 (-1.39)			-6.117 (-1.64)
Industry turnover t-1, t+5			2.715 (0.86)			1.208 (0.83)
Market volatility t-1, t+5			-0.429*** (-6.50)			-0.198*** (-5.88)
Industry volatility t-1, t+5			0.586*** (6.98)			0.300*** (8.92)
Number of Observations	321762	321762	321762	481852	481852	481852
R ²	0.061	0.064	0.067	0.057	0.062	0.063
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Industry Adjusted Returns

Dependent Variable:	Industry adjusted return t-1, t+5 (in bp)					
	Main Test - RavenPack is "live"			Placebo Test - Before RavenPack is "live"		
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH) * Sentiment Direction	0.416*** (3.11)	0.458*** (3.43)	0.457*** (3.44)	0.100 (0.97)	0.135 (1.29)	0.134 (1.28)
D(HRH)	0.170* (1.67)	0.115 (1.08)	0.115 (1.08)	0.123 (1.17)	0.093 (0.86)	0.092 (0.85)
Sentiment Direction	0.104 (0.80)	-0.025 (-0.19)	-0.023 (-0.18)	0.396*** (4.02)	0.158 (1.58)	0.162 (1.61)
Company size	-0.477*** (-4.45)	-0.508*** (-4.74)	-0.510*** (-4.75)	-0.350*** (-3.92)	-0.319*** (-3.58)	-0.304*** (-3.43)
Return prior month	-9.121* (-1.81)	-9.127* (-1.82)	-9.143* (-1.81)	-11.578** (-2.46)	-12.880*** (-2.74)	-11.879** (-2.51)
Volatility prior month	0.004 (1.58)	0.005 (1.61)	0.003 (1.04)	0.003 (1.26)	0.005* (1.78)	0.002 (0.94)
Turnover prior month	-0.021 (-0.46)	-0.019 (-0.42)	-0.027 (-0.60)	-0.026 (-0.63)	-0.010 (-0.24)	-0.017 (-0.40)
Illiquidity prior month	-0.005* (-1.78)	-0.005 (-1.54)	-0.005* (-1.77)	-0.004 (-1.25)	-0.004 (-1.25)	-0.005 (-1.43)
Article category identified		1.347*** (2.83)	1.150*** (2.62)		0.493 (1.13)	0.570 (1.20)
Time since last article		0.041*** (3.35)	0.041*** (3.37)		0.237*** (13.20)	0.239*** (13.30)
Number of firms in article		-0.143*** (-4.83)	-0.139*** (-4.68)		-0.218*** (-9.11)	-0.216*** (-9.01)
Absolute market return t-1, t+5			0.305*** (4.08)			0.172*** (2.91)
Absolute industry return t-1, t+5			-0.407*** (-4.88)			-0.252*** (-5.12)
Market turnover t-1, t+5			-5.203 (-1.07)			-6.773* (-1.85)
Industry turnover t-1, t+5			1.526 (0.45)			0.525 (0.36)
Market volatility t-1, t+5			-0.428*** (-6.56)			-0.201*** (-6.13)
Industry volatility t-1, t+5			0.582*** (6.95)			0.301*** (8.99)
Number of Observations	321762	321762	321762	481852	481852	481852
R ²	0.061	0.064	0.067	0.057	0.062	0.063
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Paper Table 6: Speed of Trade Volume Response to News Articles

This table contains the extended version of Table 6 in the paper (all control variables are reported).

Panel A: Trade Volume

Dependent Variable:	Speed of Trade Volume Response (in %)					
	Main Test - RavenPack is "live"			Placebo Test - Before RavenPack is "live"		
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH)	0.656*** (3.06)	0.516** (2.36)	0.533** (2.49)	0.033 (0.24)	-0.002 (-0.02)	0.022 (0.16)
Company size	-0.104 (-0.84)	-0.115 (-0.93)	-0.073 (-0.59)	-0.359*** (-4.41)	-0.339*** (-4.18)	-0.328*** (-4.03)
Return prior month	-10.867** (-1.97)	-8.299 (-1.50)	-7.897 (-1.44)	-4.589 (-1.17)	-4.117 (-1.05)	-4.504 (-1.15)
Volatility prior month	0.002 (0.91)	0.002 (0.62)	0.001 (0.29)	0.002 (1.19)	0.002 (1.34)	0.002 (1.28)
Turnover prior month	-0.033 (-0.78)	-0.023 (-0.52)	-0.008 (-0.19)	-0.137*** (-4.49)	-0.128*** (-4.23)	-0.131*** (-4.35)
Illiquidity prior month	-0.000 (-0.02)	0.001 (0.18)	0.001 (0.23)	-0.016*** (-3.91)	-0.015*** (-3.46)	-0.014*** (-3.23)
Absolute Composite Sentiment Score		-0.008 (-0.97)	-0.006 (-0.77)		-0.018*** (-2.66)	-0.017** (-2.54)
Neutral Composite Sentiment Score		-0.171** (-2.57)	-0.164** (-2.52)		-0.085 (-1.62)	-0.089* (-1.69)
Article category identified		-4.034*** (-3.02)	-3.973*** (-3.47)		-0.716 (-0.47)	-0.691 (-0.45)
Absolute Event Sentiment Score		0.059*** (5.82)	0.056*** (5.50)		0.023*** (3.55)	0.024*** (3.68)
Neutral Event Sentiment Score		-0.973*** (-2.82)	-1.018*** (-3.02)		-0.394* (-1.86)	-0.368* (-1.74)
Time since last article		0.109*** (5.58)	0.101*** (5.21)		0.091*** (5.98)	0.087*** (5.82)
Number of firms in article		-0.107** (-2.55)	-0.112*** (-2.70)		-0.168*** (-6.04)	-0.173*** (-6.25)
Absolute market return t-1, t+120			-0.008 (-0.74)			-0.009 (-1.28)
Absolute market return t-1, t+5			0.361*** (3.13)			0.175*** (3.43)
Absolute industry return t-1, t+120			-0.011 (-1.15)			-0.007 (-1.19)
Absolute industry return t-1, t+5			0.303*** (4.53)			0.063 (1.53)
Market turnover t-1, t+120			-4.993*** (-9.97)			-4.235*** (-9.67)
Market turnover t-1, t+5			76.175*** (9.32)			73.516*** (11.26)
Industry turnover t-1, t+120			-2.853*** (-7.93)			-2.764*** (-8.96)
Industry turnover t-1, t+5			50.799*** (8.11)			58.085*** (11.54)
Market volatility t-1, t+120			0.002 (0.02)			0.058 (1.64)
Market volatility t-1, t+5			-0.254*** (-4.53)			-0.133*** (-5.16)
Industry volatility t-1, t+120			-0.205*** (-3.45)			-0.129*** (-5.58)
Industry volatility t-1, t+5			0.295*** (7.07)			0.146*** (7.51)
Number of Observations	272019	272019	272019	418029	418029	418029
R ²	0.028	0.031	0.058	0.025	0.026	0.037
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Trade volume in direction of article

Dependent Variable:	Speed of Directional Trade Volume Response (in %)					
	Main Test - RavenPack is "live"			Placebo Test - Before RavenPack is "live"		
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH)	0.472*** (2.67)	0.376** (2.12)	0.385** (2.20)	0.080 (0.60)	0.085 (0.64)	0.082 (0.61)
Company size	-0.021 (-0.20)	-0.028 (-0.26)	-0.007 (-0.07)	-0.295*** (-3.95)	-0.282*** (-3.79)	-0.280*** (-3.76)
Return prior month	-1.343 (-0.27)	-0.898 (-0.18)	-0.274 (-0.05)	-3.380 (-0.94)	-2.451 (-0.68)	-2.697 (-0.75)
Volatility prior month	0.002 (0.81)	0.001 (0.62)	0.001 (0.23)	0.002 (1.03)	0.002 (1.18)	0.002 (1.12)
Turnover prior month	-0.022 (-0.66)	-0.015 (-0.45)	-0.004 (-0.12)	-0.128*** (-4.41)	-0.120*** (-4.14)	-0.121*** (-4.18)
Illiquidity prior month	-0.007 (-1.31)	-0.007 (-1.25)	-0.006 (-1.13)	-0.008** (-2.09)	-0.008* (-1.95)	-0.008* (-1.91)
Absolute Composite Sentiment Score		-0.001 (-0.12)	0.000 (0.01)		-0.018*** (-3.56)	-0.017*** (-3.48)
Neutral Composite Sentiment Score		-0.286*** (-3.58)	-0.270*** (-3.41)		-0.160*** (-2.72)	-0.164*** (-2.81)
Article category identified		0.000 (.)	0.000 (0.00)		-0.728 (-0.93)	-0.725 (-0.90)
Absolute Event Sentiment Score		0.030*** (4.47)	0.029*** (4.25)		0.024*** (4.99)	0.024*** (5.07)
Neutral Event Sentiment Score		1.954*** (5.51)	1.910*** (7.42)		0.000 (.)	0.000 (.)
Time since last article		0.091*** (5.92)	0.088*** (5.77)		0.055*** (4.25)	0.053*** (4.11)
Number of firms in article		-0.009 (-0.23)	-0.011 (-0.29)		-0.085*** (-3.27)	-0.087*** (-3.33)
Absolute market return t-1, t+120			-0.015 (-1.56)			-0.001 (-0.20)
Absolute market return t-1, t+5			0.183** (2.37)			0.148*** (3.39)
Absolute industry return t-1, t+120			0.006 (0.65)			-0.005 (-1.02)
Absolute industry return t-1, t+5			0.174*** (3.14)			0.025 (0.66)
Market turnover t-1, t+120			-2.340*** (-5.61)			-2.128*** (-5.92)
Market turnover t-1, t+5			35.751*** (6.03)			37.249*** (8.28)
Industry turnover t-1, t+120			-1.477*** (-5.98)			-1.341*** (-6.10)
Industry turnover t-1, t+5			22.449*** (5.44)			24.379*** (7.97)
Market volatility t-1, t+120			-0.048 (-0.77)			0.058* (1.90)
Market volatility t-1, t+5			-0.070 (-1.64)			-0.114*** (-5.26)
Industry volatility t-1, t+120			-0.028 (-0.64)			-0.067*** (-3.26)
Industry volatility t-1, t+5			0.074** (2.26)			0.094*** (5.95)
Number of Observations	168278	168278	168278	272477	272477	272477
R ²	0.046	0.051	0.063	0.039	0.040	0.045
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Paper Table 7: Press Releases vs. Non-Press Releases

This table contains the extended version of Table 7 in the paper (all control variables are reported).

Panel A: Main Test

Dependent Variable:	Speed of Stock Price Response (in %)		Speed of Trade Volume Response (in %)		Signed Return t-1, t+5 (in bp)	
	(1)	(2)	(3)	(4)	(5)	(6)
D(Press Release) * D(HRH)	1.686** (2.05)	1.813** (2.25)	1.044*** (2.85)	1.195*** (3.32)	1.038*** (3.15)	0.992*** (2.97)
D(HRH)	1.003* (1.96)	0.791 (1.63)	0.348 (1.50)	0.181 (0.78)	0.184 (1.07)	0.053 (0.30)
D(Press Release)	-0.885 (-1.09)	-1.487* (-1.87)	-0.760** (-2.11)	-1.019*** (-2.90)	-0.160 (-0.49)	-0.484 (-1.41)
Sentiment Direction					0.276*** (8.93)	0.231*** (7.10)
Company size		1.630*** (5.73)		-0.074 (-0.60)		-0.587*** (-3.94)
Return prior month		1.679 (0.15)		-7.827 (-1.42)		-1.355 (-0.18)
Volatility prior month		-0.003 (-0.64)		0.001 (0.29)		0.007* (1.69)
Turnover prior month		0.401*** (3.50)		-0.008 (-0.18)		0.003 (0.05)
Illiquidity prior month		0.013 (1.26)		0.001 (0.22)		-0.008** (-2.02)
Absolute Composite Sentiment Score		-0.001 (-0.06)		-0.006 (-0.72)		
Neutral Composite Sentiment Score		-0.116 (-1.03)		-0.165** (-2.54)		
Absolute Event Sentiment Score		0.090*** (4.90)		0.056*** (5.53)		
Neutral Event Sentiment Score		-1.108* (-1.90)		-1.095*** (-3.21)		
Article category identified		1.167 (0.23)		-4.090*** (-3.55)		0.932 (1.61)
Time since last article		0.079** (2.25)		0.097*** (4.95)		0.041** (2.51)
Number of firms in article		-0.061 (-0.70)		-0.113*** (-2.73)		-0.222*** (-5.29)
Absolute market return t-1, t+5		1.117*** (4.51)		0.361*** (3.13)		0.268** (2.33)
Absolute industry return t-1, t+5		1.915*** (9.09)		0.303*** (4.53)		-0.526*** (-4.71)
Market turnover t-1, t+5		110.016*** (8.56)		76.169*** (9.32)		-0.695 (-0.08)
Industry turnover t-1, t+5		38.218*** (3.98)		50.810*** (8.11)		-3.395 (-0.86)
Market volatility t-1, t+5		-0.557*** (-4.45)		-0.254*** (-4.54)		-0.501*** (-5.29)
Industry volatility t-1, t+5		0.749*** (7.71)		0.295*** (7.06)		0.748*** (6.67)
Absolute market return t-1, t+120		-0.141*** (-6.43)		-0.008 (-0.75)		
Absolute industry return t-1, t+120		-0.257*** (-10.88)		-0.011 (-1.14)		
Market turnover t-1, t+120		-3.928*** (-4.68)		-4.997*** (-9.97)		
Industry turnover t-1, t+120		-1.531*** (-2.95)		-2.856*** (-7.94)		
Market volatility t-1, t+120		0.205 (1.34)		0.002 (0.02)		
Industry volatility t-1, t+120		-0.394*** (-3.67)		-0.205*** (-3.45)		
Number of Observations	248888	248849	272058	272019	198263	198225
R ²	0.034	0.084	0.028	0.058	0.086	0.095
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes	No	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Placebo Test

Dependent Variable:	Speed of Stock Price Response (in %)		Speed of Trade Volume Response (in %)		Signed Return t-1, t+5 (in bp)	
	(1)	(2)	(3)	(4)	(5)	(6)
D(Press Release) * D(HRH)	0.265 (0.48)	0.344 (0.63)	0.038 (0.13)	0.059 (0.20)	0.396 (1.07)	0.363 (0.98)
D(HRH)	-0.140 (-0.43)	-0.095 (-0.30)	0.034 (0.22)	0.008 (0.06)	0.177 (1.06)	0.107 (0.65)
D(Press Release)	0.112 (0.20)	0.076 (0.14)	0.222 (0.76)	0.089 (0.30)	1.283*** (3.59)	0.938*** (2.68)
Sentiment Direction					0.276*** (11.76)	0.214*** (8.56)
Company size		1.131*** (7.21)		-0.329*** (-4.05)		-0.477*** (-4.21)
Return prior month		-9.473 (-1.32)		-4.486 (-1.15)		-22.883*** (-3.73)
Volatility prior month		-0.002 (-0.55)		0.002 (1.29)		0.001 (0.42)
Turnover prior month		0.203*** (3.08)		-0.131*** (-4.34)		-0.065 (-1.24)
Illiquidity prior month		-0.028 (-3.58)		-0.014** (-3.23)		-0.001 (-0.33)
Absolute Composite Sentiment Score		-0.030** (-2.21)		-0.016** (-2.41)		
Neutral Composite Sentiment Score		-0.355*** (-3.64)		-0.088* (-1.67)		
Absolute Event Sentiment Score		0.024** (2.00)		0.025*** (3.76)		
Neutral Event Sentiment Score		-1.302*** (-3.25)		-0.419** (-1.97)		
Article category identified		-4.294 (-0.73)		-0.738 (-0.49)		0.441 (1.05)
Time since last article		0.045* (1.72)		0.081*** (5.39)		0.193*** (10.43)
Number of firms in article		-0.165*** (-2.90)		-0.171*** (-6.18)		-0.206*** (-6.08)
Absolute market return t-1, t+5		0.563*** (4.16)		0.175*** (3.44)		0.066 (1.00)
Absolute industry return t-1, t+5		1.053*** (7.30)		0.063 (1.53)		-0.215*** (-4.10)
Market turnover t-1, t+5		138.671*** (15.03)		73.473*** (11.26)		-0.533 (-0.11)
Industry turnover t-1, t+5		23.464*** (5.62)		58.088*** (11.55)		2.348 (1.33)
Market volatility t-1, t+5		-0.221*** (-3.85)		-0.133*** (-5.16)		-0.127*** (-3.65)
Industry volatility t-1, t+5		0.545*** (11.45)		0.146*** (7.51)		0.260*** (6.89)
Absolute market return t-1, t+120		-0.054*** (-3.03)		-0.009 (-1.28)		
Absolute industry return t-1, t+120		-0.194*** (-11.24)		-0.007 (-1.19)		
Market turnover t-1, t+120		-5.443*** (-7.82)		-4.237*** (-9.67)		
Industry turnover t-1, t+120		-0.191 (-0.51)		-2.763*** (-8.96)		
Market volatility t-1, t+120		0.126* (1.83)		0.058 (1.64)		
Industry volatility t-1, t+120		-0.301*** (-6.29)		-0.130*** (-5.59)		
Number of Observations	400304	400158	418187	418029	316945	316783
R ²	0.031	0.048	0.025	0.037	0.076	0.081
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes	No	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Paper Table 9: Directional Stock Price Response conditional on Past Informativeness of RavenPack

This table contains the extended version of Table 9 in the paper (all control variables are reported). In Panel A the dependent variable is raw return (as in the paper). In Panel B, it is market adjusted return. In Panel C, it is industry adjusted return.

Panel A: Main Test – Raw Returns

Dependent Variable:	Return t-1, t+5					
	Main Test - RavenPack is "live"			Placebo Test - Before RavenPack is "live"		
	(1)	(2)	(3)	(4)	(5)	(6)
Past Informativeness 6 month 12FF * D(HRH)						
* Sentiment Direction	0.221*** (2.96)	0.213*** (2.84)	0.225*** (2.94)	-0.178* (-1.76)	-0.165 (-1.65)	-0.168* (-1.68)
Past Informativeness 6 month 12FF *						
Sentiment Direction	-0.025 (-0.35)	-0.034 (-0.46)	-0.049 (-0.66)	0.354*** (3.63)	0.311*** (3.21)	0.310*** (3.21)
Past Informativeness 6 month 12FF * D(HRH)	0.044 (0.77)	0.026 (0.45)	0.037 (0.64)	0.050 (0.58)	0.049 (0.56)	0.051 (0.59)
D(HRH) * Sentiment Direction	0.020 (0.12)	0.075 (0.43)	0.056 (0.32)	0.497*** (2.60)	0.507*** (2.60)	0.512*** (2.64)
Past Informativeness 3 month 12FF	-0.078 (-1.26)	-0.055 (-0.89)	-0.145** (-2.24)	-0.043 (-0.49)	-0.031 (-0.35)	-0.098 (-1.11)
D(HRH)	0.112 (0.84)	0.083 (0.61)	0.064 (0.47)	0.002 (0.01)	-0.030 (-0.17)	-0.037 (-0.21)
Sentiment Direction	0.155 (0.89)	0.048 (0.28)	0.075 (0.42)	-0.393** (-2.13)	-0.531*** (-2.82)	-0.525*** (-2.80)
Company size	-0.482*** (-4.47)	-0.512*** (-4.76)	-0.513*** (-4.75)	-0.353*** (-3.87)	-0.321*** (-3.54)	-0.307*** (-3.40)
Return prior month	-9.384* (-1.85)	-9.335* (-1.84)	-9.426* (-1.85)	-11.317** (-2.39)	-12.798*** (-2.71)	-11.875*** (-2.50)
Volatility prior month	0.004 (1.54)	0.004 (1.57)	0.003 (1.05)	0.003 (1.02)	0.004 (1.53)	0.002 (0.77)
Turnover prior month	-0.026 (-0.57)	-0.024 (-0.53)	-0.030 (-0.67)	-0.021 (-0.48)	-0.005 (-0.11)	-0.010 (-0.24)
Illiquidity prior month	-0.005* (-1.73)	-0.004 (-1.50)	-0.005* (-1.76)	-0.004 (-1.06)	-0.004 (-1.07)	-0.005 (-1.27)
Article category identified		1.262** (2.23)	1.044** (2.17)		0.336 (0.87)	0.422 (1.08)
Time since last article		0.043*** (3.45)	0.044*** (3.50)		0.239*** (13.10)	0.240*** (13.17)
Number of firms in article		-0.152*** (-5.01)	-0.146*** (-4.85)		-0.222*** (-9.21)	-0.220*** (-9.13)
Absolute market return t-1, t+5			0.301*** (3.75)			0.192*** (2.81)
Absolute industry return t-1, t+5			-0.430*** (-4.88)			-0.245*** (-5.06)
Market turnover t-1, t+5			-8.829 (-1.47)			-2.874 (-0.66)
Industry turnover t-1, t+5			2.927 (0.95)			1.408 (0.92)
Market volatility t-1, t+5			-0.420*** (-6.28)			-0.197*** (-5.58)
Industry volatility t-1, t+5			0.594*** (7.03)			0.298*** (8.77)
Number of Observations	321762	321762	321762	472736	472736	472736
R ²	0.061	0.064	0.067	0.057	0.062	0.063
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Market Adjusted Returns

Dependent Variable:	Market adjusted return t-1, t+5					
	Main Test - RavenPack is "live"			Placebo Test - Before RavenPack is "live"		
	(1)	(2)	(3)	(4)	(5)	(6)
Past Informativeness 6 month 12FF * D(HRH)						
* Sentiment Direction	0.238*** (3.27)	0.231*** (3.15)	0.242*** (3.23)	-0.174* (-1.73)	-0.162 (-1.62)	-0.164* (-1.65)
Past Informativeness 6 month 12FF *						
Sentiment Direction	-0.047 (-0.68)	-0.056 (-0.80)	-0.071 (-0.98)	0.351*** (3.62)	0.308*** (3.20)	0.306*** (3.20)
Past Informativeness 6 month 12FF * D(HRH)	0.022 (0.40)	0.006 (0.10)	0.016 (0.28)	0.051 (0.59)	0.050 (0.58)	0.053 (0.61)
D(HRH) * Sentiment Direction	0.005 (0.03)	0.055 (0.33)	0.037 (0.21)	0.500*** (2.60)	0.511*** (2.61)	0.517*** (2.65)
Past Informativeness 3 month 12FF	-0.055 (-0.92)	-0.034 (-0.55)	-0.123* (-1.96)	-0.045 (-0.51)	-0.033 (-0.38)	-0.101 (-1.15)
D(HRH)	0.142 (1.05)	0.118 (0.86)	0.100 (0.72)	-0.013 (-0.08)	-0.044 (-0.25)	-0.052 (-0.29)
Sentiment Direction	0.179 (1.07)	0.072 (0.43)	0.098 (0.58)	-0.402** (-2.18)	-0.542*** (-2.88)	-0.535*** (-2.86)
Company size	-0.477*** (-4.43)	-0.506*** (-4.71)	-0.507*** (-4.70)	-0.350*** (-3.84)	-0.318*** (-3.52)	-0.305*** (-3.38)
Return prior month	-9.613* (-1.90)	-9.589* (-1.91)	-9.652* (-1.91)	-11.738** (-2.46)	-13.194*** (-2.77)	-12.239** (-2.55)
Volatility prior month	0.004 (1.59)	0.005 (1.61)	0.003 (1.09)	0.003 (1.18)	0.004* (1.69)	0.002 (0.91)
Turnover prior month	-0.022 (-0.48)	-0.020 (-0.44)	-0.026 (-0.58)	-0.028 (-0.65)	-0.011 (-0.26)	-0.017 (-0.40)
Illiquidity prior month	-0.005* (-1.73)	-0.004 (-1.50)	-0.005* (-1.76)	-0.004 (-1.03)	-0.004 (-1.05)	-0.004 (-1.27)
Article category identified		1.371** (2.48)	1.167** (2.42)		0.366 (0.96)	0.455 (1.14)
Time since last article		0.041*** (3.32)	0.041*** (3.37)		0.239*** (13.11)	0.240*** (13.20)
Number of firms in article		-0.146*** (-4.88)	-0.140*** (-4.72)		-0.221*** (-9.16)	-0.219*** (-9.06)
Absolute market return t-1, t+5			0.294*** (3.85)			0.142** (2.38)
Absolute industry return t-1, t+5			-0.403*** (-4.82)			-0.238*** (-5.11)
Market turnover t-1, t+5			-6.696 (-1.45)			-5.977 (-1.59)
Industry turnover t-1, t+5			2.906 (0.92)			1.193 (0.80)
Market volatility t-1, t+5			-0.432*** (-6.54)			-0.197*** (-5.84)
Industry volatility t-1, t+5			0.588*** (6.99)			0.300*** (8.85)
Number of Observations	321762	321762	321762	472736	472736	472736
R ²	0.061	0.064	0.067	0.058	0.063	0.064
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Industry Adjusted Returns

Dependent Variable:	Industry Adjusted return t-1, t+5					
	Main Test - RavenPack is "live"			Placebo Test - Before RavenPack is "live"		
	(1)	(2)	(3)	(4)	(5)	(6)
Past Informativeness 6 month 12FF * D(HRH)						
* Sentiment Direction	0.245*** (3.35)	0.239*** (3.24)	0.250*** (3.31)	-0.178* (-1.79)	-0.167* (-1.68)	-0.169* (-1.71)
Past Informativeness 6 month 12FF *						
Sentiment Direction	-0.055 (-0.78)	-0.064 (-0.91)	-0.079 (-1.08)	0.353*** (3.69)	0.311*** (3.27)	0.309*** (3.26)
Past Informativeness 6 month 12FF * D(HRH)	0.022 (0.40)	0.006 (0.10)	0.015 (0.27)	0.050 (0.59)	0.049 (0.58)	0.051 (0.61)
D(HRH) * Sentiment Direction	-0.016 (-0.10)	0.034 (0.21)	0.016 (0.09)	0.518*** (2.75)	0.530*** (2.75)	0.535*** (2.79)
Past Informativeness 3 month 12FF	-0.053 (-0.88)	-0.031 (-0.51)	-0.117* (-1.89)	-0.043 (-0.51)	-0.031 (-0.37)	-0.098 (-1.15)
D(HRH)	0.135 (1.00)	0.112 (0.81)	0.095 (0.69)	-0.012 (-0.07)	-0.040 (-0.23)	-0.048 (-0.28)
Sentiment Direction	0.197 (1.19)	0.090 (0.55)	0.115 (0.69)	-0.416** (-2.30)	-0.556*** (-3.01)	-0.550*** (-2.99)
Company size	-0.484*** (-4.49)	-0.513*** (-4.77)	-0.513*** (-4.76)	-0.360*** (-3.97)	-0.329*** (-3.65)	-0.316*** (-3.51)
Return prior month	-9.455* (-1.88)	-9.430* (-1.88)	-9.496* (-1.88)	-11.352** (-2.37)	-12.796*** (-2.67)	-11.874*** (-2.47)
Volatility prior month	0.004 (1.54)	0.004 (1.57)	0.003 (1.05)	0.003 (1.15)	0.004* (1.66)	0.002 (0.89)
Turnover prior month	-0.020 (-0.45)	-0.018 (-0.41)	-0.024 (-0.54)	-0.028 (-0.66)	-0.012 (-0.27)	-0.017 (-0.40)
Illiquidity prior month	-0.005* (-1.73)	-0.004 (-1.50)	-0.005* (-1.76)	-0.004 (-1.11)	-0.004 (-1.13)	-0.005 (-1.34)
Article category identified		1.454*** (3.00)	1.257*** (2.81)		0.523 (1.14)	0.619 (1.24)
Time since last article		0.041*** (3.37)	0.042*** (3.40)		0.239*** (13.12)	0.241*** (13.21)
Number of firms in article		-0.145*** (-4.88)	-0.140*** (-4.72)		-0.219*** (-9.07)	-0.216*** (-8.96)
Absolute market return t-1, t+5			0.307*** (4.10)			0.171*** (2.88)
Absolute industry return t-1, t+5			-0.408*** (-4.87)			-0.254*** (-5.13)
Market turnover t-1, t+5			-5.456 (-1.12)			-6.622* (-1.79)
Industry turnover t-1, t+5			1.705 (0.51)			0.486 (0.33)
Market volatility t-1, t+5			-0.432*** (-6.60)			-0.200*** (-6.08)
Industry volatility t-1, t+5			0.584*** (6.95)			0.301*** (8.92)
Number of Observations	321762	321762	321762	472736	472736	472736
R ²	0.061	0.064	0.067	0.058	0.063	0.064
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Paper Table 10: HFT Trading Response to News Articles

This table contains the extended version of Table 10 in the paper (all control variables are reported).

Dependent Variable:	HFT Trading Fraction Response (in %)					
	All Articles		Press Releases		Non-Press Releases	
	(1)	(2)	(3)	(4)	(5)	(6)
RavenPack Release	1.735*** (3.10)	1.784*** (3.20)	3.538** (2.54)	3.880** (2.50)	1.258* (1.91)	1.343* (1.92)
Company size	2.092*** (3.02)	1.930*** (7.63)	3.195* (1.85)	3.603*** (3.46)	1.758** (2.38)	1.451** (2.02)
Return prior month	-64.573 (-1.38)	-58.170 (-1.31)	-128.222 (-1.08)	-128.471 (-1.03)	-49.385 (-1.02)	-37.243 (-0.81)
Volatility prior month	0.035* (1.82)	0.033* (1.72)	0.040 (1.12)	0.043 (1.18)	0.031 (1.43)	0.028 (1.35)
Turnover prior month	0.683*** (2.96)	0.710** (2.57)	1.178 (0.98)	1.258 (1.02)	0.629** (2.52)	0.647*** (2.64)
Illiquidity prior month	0.046 (1.01)	0.034 (0.44)	0.116 (0.91)	0.097 (0.52)	0.023 (0.50)	0.006 (0.13)
Article category identified		-0.031 (-0.39)		-0.248 (-1.40)		0.007 (0.09)
Neutral Composite Sentiment Score		-0.070 (-0.12)		-2.758* (-1.88)		0.437 (0.65)
Article category identified		-8.47e+05 (-0.00)		-8.84e+04 (-0.00)		0.000 (.)
Absolute Event Sentiment Score		0.148** (2.06)		0.397** (2.40)		0.099 (1.12)
Neutral Event Sentiment Score		1.064 (0.35)		1.755 (0.27)		-0.431 (-0.10)
Time since last article		-0.126 (-0.42)		0.687 (0.97)		-0.422 (-1.26)
Number of firms in article		-0.681* (-1.78)		1.323 (1.13)		-0.706* (-1.82)
Number of Observations	5163	5162	1014	1012	4149	4147
R ²	0.010	0.019	0.016	0.044	0.009	0.022
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes	No	Yes
Firm specific control variables	Yes	Yes	Yes	Yes	Yes	Yes

Paper Table 11: HFT Trading Response to News Articles

This table contains the extended version of Table 11 in the paper (all control variables are reported).

Panel A: Split by liquidity demanding (active) and liquidity supplying (passive) trades

Dependent Variable:	Active HFT Trading Fraction Response (in %)		Passive HFT Trading Fraction Response (in %)	
	(1)	(2)	(3)	(4)
RavenPack Release	2.394** (2.54)	2.345** (2.60)	1.054 (1.21)	0.935 (1.06)
Company size	0.045 (0.05)	0.093 (0.31)	4.187*** (4.57)	4.000*** (4.10)
Return prior month	-54.745 (-0.69)	-51.643 (-0.67)	-121.891** (-2.08)	-107.978* (-1.82)
Volatility prior month	0.056 (1.61)	0.055* (1.76)	0.000 (0.01)	-0.006 (-0.22)
Turnover prior month	2.044*** (3.91)	2.084*** (4.22)	1.182*** (2.64)	1.290*** (2.79)
Illiquidity prior month	-0.032 (-0.44)	-0.035 (-0.45)	0.134** (2.15)	0.120* (1.85)
Absolute Composite Sentiment Score		0.136 (1.53)		-0.070 (-0.67)
Neutral Composite Sentiment Score		1.090 (1.34)		0.245 (0.28)
Article category identified		-4.15e+06 (-0.00)		25834.284 (0.00)
Absolute Event Sentiment Score		0.297*** (2.78)		0.094 (0.94)
Neutral Event Sentiment Score		4.500 (0.96)		0.694 (0.18)
Time since last article		0.085 (0.22)		-0.597* (-1.93)
Number of firms in article		-0.361 (-0.66)		-0.721 (-1.35)
Number of Observations	5116	5115	5088	5087
R ²	0.009	0.023	0.015	0.025
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes

Panel B: Split by whether HFTs trade with the news sentiment or against the news sentiment

Dependent Variable:	With News HFT Trading Fraction Response (in %)		Against News HFT Trading Fraction Response (in %)	
	(1)	(2)	(3)	(4)
RavenPack Release	2.084 [*] (1.96)	1.881 [*] (1.84)	0.496 (0.44)	0.601 (0.56)
Company size	2.271 ^{**} (2.37)	2.283 ^{***} (12.38)	3.553 ^{***} (3.32)	3.215 ^{***} (13.77)
Return prior month	-198.885 ^{**} (-2.45)	-178.782 ^{**} (-2.19)	30.283 (0.38)	39.508 (0.51)
Volatility prior month	0.026 (0.65)	0.022 (0.53)	0.040 (1.66)	0.039 [*] (1.69)
Turnover prior month	0.912 (1.33)	0.934 (1.34)	2.135 ^{***} (5.85)	2.253 ^{***} (5.82)
Illiquidity prior month	0.064 (0.94)	0.059 (0.76)	0.129 [*] (1.74)	0.106 (1.46)
Absolute Composite Sentiment Score		0.061 (0.53)		-0.027 (-0.22)
Neutral Composite Sentiment Score		0.450 (0.27)		2.209 (1.17)
Article category identified		0.000 (0.00)		0.000 (0.00)
Absolute Event Sentiment Score		0.172 [*] (1.76)		0.141 (1.28)
Neutral Event Sentiment Score		67155.489 (0.00)		1.14e+06 (0.00)
Time since last article		-0.427 (-0.97)		-0.072 (-0.18)
Number of firms in article		-0.228 (-0.43)		-0.968 (-1.59)
Number of Observations	3302	3301	3309	3308
R ²	0.007	0.021	0.011	0.026
Relevance, Category and Hour Fixed Effects	No	Yes	No	Yes

Paper Table 12: The Effect of News Articles on Liquidity

This table contains the extended version of Table 12 in the paper (all control variables are reported).

Panel A: Main Specification – RavenPack is “live”

Dependent Variable:	Change in Effective Spread (in %)			Change in Amihud Illiquidity (in %)		
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH)	0.883* (1.96)	1.268*** (2.84)	1.281*** (2.85)	1.633** (2.35)	1.408** (2.03)	1.357** (1.99)
Company size	2.944*** (10.68)	2.889*** (10.59)	2.962*** (10.94)	3.014*** (3.89)	3.038*** (3.91)	3.206*** (4.10)
Return prior month	-39.496*** (-3.30)	-38.489*** (-3.23)	-41.052*** (-3.46)	21.387 (0.91)	26.795 (1.14)	26.442 (1.14)
Volatility prior month	0.010** (2.06)	0.008 (1.59)	0.009* (1.65)	-0.006 (-0.59)	-0.006 (-0.52)	-0.016 (-1.63)
Turnover prior month	1.627*** (15.82)	1.596*** (15.56)	1.616*** (15.86)	-0.134 (-0.61)	-0.107 (-0.49)	-0.032 (-0.15)
Illiquidity prior month	0.008 (0.58)	0.006 (0.44)	0.009 (0.66)	0.036 (1.33)	0.037 (1.38)	0.035 (1.27)
Absolute Composite Sentiment Score		0.042** (2.16)	0.046** (2.35)		-0.025 (-0.88)	-0.011 (-0.38)
Neutral Composite Sentiment Score		-0.398*** (-2.76)	-0.403*** (-2.80)		0.052 (0.22)	0.080 (0.36)
Article category identified		-12.021 (-1.47)	-12.719 (-1.50)		-4.158 (-0.50)	-3.938 (-0.45)
Absolute Event Sentiment Score		0.073*** (3.36)	0.072*** (3.32)		0.067** (2.31)	0.065** (2.27)
Neutral Event Sentiment Score		-1.658** (-2.21)	-1.768** (-2.36)		-2.197** (-2.05)	-2.341** (-2.20)
Time since last article		-0.436*** (-10.70)	-0.459*** (-11.35)		0.350*** (5.15)	0.253*** (3.75)
Number of firms in article		1.427*** (14.32)	1.433*** (14.74)		-0.637*** (-4.65)	-0.542*** (-4.02)
Absolute market return t-1, t+5			-0.184 (-0.92)			0.310 (1.04)
Absolute industry return t-1, t+5			-0.204 (-1.21)			1.861*** (6.22)
Market turnover t-1, t+5			119.077*** (7.82)			79.982*** (4.48)
Industry turnover t-1, t+5			12.387** (1.97)			43.008*** (3.21)
Market volatility t-1, t+5			0.459*** (4.12)			-0.515*** (-2.96)
Industry volatility t-1, t+5			-0.120 (-1.55)			0.915*** (6.01)
Number of Observations	252077	252077	252077	115630	115630	115630
R ²	0.162	0.165	0.170	0.091	0.092	0.122
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Placebo Test - Before RavenPack is “live”

Dependent Variable:	Change in Effective Spread (in %)			Change in Amihud Illiquidity (in %)		
	(1)	(2)	(3)	(4)	(5)	(6)
D(HRH)	-0.032 (-0.11)	0.480 (1.60)	0.445 (1.49)	0.861 (1.43)	0.687 (1.14)	0.631 (1.05)
Company size	2.560*** (14.23)	2.662*** (14.94)	2.715*** (15.29)	2.850*** (7.27)	2.896*** (7.47)	2.986*** (7.74)
Return prior month	-66.785*** (-8.39)	-59.745*** (-7.54)	-58.994*** (-7.45)	-0.018 (-0.00)	-1.991 (-0.13)	0.242 (0.02)
Volatility prior month	0.008** (2.16)	0.008** (2.00)	0.006 (1.53)	-0.017** (-2.42)	-0.016** (-2.24)	-0.025*** (-3.42)
Turnover prior month	1.848*** (23.37)	1.807*** (23.10)	1.796*** (23.10)	-0.017 (-0.12)	0.017 (0.12)	0.005 (0.04)
Illiquidity prior month	-0.007 (-0.65)	-0.010 (-0.93)	-0.010 (-0.94)	-0.023 (-1.31)	-0.018 (-1.06)	-0.020 (-1.17)
Absolute Composite Sentiment Score		0.042*** (2.93)	0.042*** (2.93)		-0.027 (-1.04)	-0.026 (-0.99)
Neutral Composite Sentiment Score		-0.204** (-2.02)	-0.199** (-1.96)		-0.467** (-2.24)	-0.456** (-2.21)
Article category identified		-0.822 (-0.13)	-0.731 (-0.11)		3.131 (0.34)	1.952 (0.23)
Absolute Event Sentiment Score		0.093*** (7.43)	0.095*** (7.68)		0.068*** (2.85)	0.075*** (3.15)
Neutral Event Sentiment Score		-1.268*** (-3.08)	-1.060*** (-2.61)		-0.463 (-0.52)	-0.388 (-0.44)
Time since last article		-0.244*** (-9.55)	-0.270*** (-10.59)		0.534*** (8.57)	0.485*** (7.73)
Number of firms in article		0.827*** (15.14)	0.778*** (14.50)		-0.807*** (-7.69)	-0.827*** (-7.94)
Absolute market return t-1, t+5			0.129 (0.97)			0.193 (1.04)
Absolute industry return t-1, t+5			-0.179** (-2.02)			1.178*** (6.30)
Market turnover t-1, t+5			180.763*** (15.58)			88.705*** (6.91)
Industry turnover t-1, t+5			40.709*** (8.24)			-2.149 (-0.35)
Market volatility t-1, t+5			-0.312*** (-5.86)			-0.130 (-1.62)
Industry volatility t-1, t+5			0.159*** (4.01)			0.570*** (8.72)
Number of Observations	411734	411734	411734	178102	178102	178102
R ²	0.156	0.160	0.167	0.067	0.069	0.077
Relevance, Category and Hour Fixed Effects	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Paper Table 13: Difference in Difference Analysis

This table contains the extended version of Table 8 in the paper (all control variables are reported). In Panel A, the dependent variables are based on raw return (as in the paper). In Panel B, they are based on market adjusted return and in Panel C on industry adjusted return.

Panel A: Raw Returns

Dependent Variable:	Speed of Stock Price Response			Speed of Trade Volume Response			Return t-1, t+5		
	(1b)	(1c)	(2)	(3b)	(3c)	(4)	(5b)	(5c)	(6)
RavenPack Release * D(HRH) * Sentiment Dummy							0.336** (2.12)	0.329** (2.06)	0.330** (2.08)
RavenPack Release * D(HRH)	1.702*** (3.73)	1.784*** (3.90)	1.709*** (3.88)	0.502* (1.70)	0.511* (1.74)	0.488* (1.71)	0.101 (0.73)	0.104 (0.73)	0.109 (0.77)
RavenPack Release * Sentiment Direction							-0.314** (-2.05)	-0.292* (-1.89)	-0.294* (-1.91)
RavenPack Release * Sentiment							0.072 (0.70)	0.116 (1.11)	0.114 (1.09)
D(HRH)	-0.053 (-0.19)	-0.118 (-0.42)	-0.057 (-0.21)	0.082 (0.56)	0.007 (0.05)	0.039 (0.27)	0.095 (0.96)	0.025 (0.25)	0.025 (0.24)
Sentiment Direction							0.430*** (4.36)	0.218** (2.17)	0.222** (2.21)
Company size	1.252*** (9.93)	1.299*** (10.20)	1.341*** (10.47)	-0.278*** (-4.80)	-0.270*** (-4.66)	-0.254*** (-4.37)	-0.336*** (-6.07)	-0.315*** (-5.77)	-0.309*** (-5.65)
Return prior month	-9.471 (-1.62)	-7.331 (-1.26)	-6.262 (-1.06)	-6.241** (-2.05)	-5.421* (-1.78)	-5.635* (-1.86)	11.122*** (-3.23)	12.091*** (-3.53)	10.964*** (-3.19)
Volatility prior month	0.001 (0.42)	0.001 (0.48)	-0.001 (-0.44)	0.002 (1.42)	0.002 (1.47)	0.002 (1.19)	0.004** (2.38)	0.005*** (2.84)	0.003 (1.64)
Turnover prior month	0.250*** (3.93)	0.258*** (4.02)	0.254*** (3.92)	-0.104*** (-4.54)	-0.095*** (-4.11)	-0.093*** (-4.00)	-0.015 (-0.53)	0.002 (0.06)	-0.005 (-0.19)
Illiquidity prior month	-0.018*** (-3.05)	-0.017*** (-2.80)	-0.016*** (-2.64)	-0.012*** (-3.59)	-0.010*** (-3.23)	-0.010*** (-2.95)	-0.006** (-2.53)	-0.005** (-2.45)	-0.006*** (-2.67)
Absolute Composite Sentiment Score		-0.028*** (-2.67)	-0.027*** (-2.62)		-0.015*** (-2.90)	-0.013*** (-2.66)			
Neutral Composite Sentiment Score		-0.263*** (-3.41)	-0.280*** (-3.72)		-0.112*** (-2.68)	-0.111*** (-2.70)			
Absolute Event Sentiment Score		0.046*** (4.55)	0.044*** (4.46)		0.035*** (6.33)	0.035*** (6.28)			
Neutral Event Sentiment Score		-0.982*** (-2.95)	-1.012*** (-3.10)		-0.535*** (-3.01)	-0.529*** (-3.01)			
Article category identified		-1.573 (-0.33)	-1.672 (-0.39)		-2.274** (-2.11)	-2.300** (-2.12)		0.616*** (2.80)	0.580** (2.38)
Time since last article		0.062*** (2.99)	0.054*** (2.63)		0.089*** (7.45)	0.085*** (7.15)		0.164*** (12.97)	0.165*** (13.08)
Number of firms in article		-0.090* (-1.80)	-0.109** (-2.24)		-0.126*** (-5.37)	-0.132*** (-5.63)		-0.202*** (-10.85)	-0.201*** (-10.77)
Absolute market return t-1, t+5			0.767*** (5.06)			0.255*** (3.69)			0.213*** (4.00)
Absolute industry return t-1, t+5			1.362*** (9.52)			0.151*** (4.05)			-0.293*** (-6.88)
Market turnover t-1, t+5			136.461* (11.59)			75.999*** (8.96)			-7.375* (-1.80)
Industry turnover t-1, t+5			31.665*** (6.33)			56.068*** (14.13)			3.252** (2.12)
Market volatility t-1, t+5			-0.333*** (-5.84)			-0.171*** (-6.50)			-0.242*** (-7.76)
Industry volatility t-1, t+5			0.610*** (12.47)			0.189*** (9.65)			0.371*** (10.73)
Absolute market return t-1, t+120			-0.084*** (-5.55)			-0.007 (-1.25)			
Absolute industry return t-1, t+120			-0.215*** (-13.87)			-0.008 (-1.61)			
Market turnover t-1, t+120			-5.656*** (-10.11)			-5.003*** (-16.83)			
Industry turnover t-1, t+120			-0.684** (-2.22)			-2.782*** (-14.06)			
Market volatility t-1, t+120			0.186*** (2.85)			0.065* (1.94)			
Industry volatility t-1, t+120			-0.347*** (-7.27)			-0.157*** (-6.97)			
Number of Observations	649247	649247	649247	690268	690268	690268	803725	803725	803725
R ²	0.026	0.028	0.054	0.018	0.020	0.037	0.046	0.050	0.052
Relevance, Category and Hour F.E.	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Date and Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Market Adjusted Returns

Dependent Variable:	Speed of Stock Price Response – Market adjusted				Market adjusted return t-1, t+5			
	(1)	(1b)	(1c)	(2)	(5)	(5b)	(5c)	(6)
RavenPack Release * D(HRH) * Sentiment Dummy					0.333**	0.335**	0.327**	0.327**
					(2.09)	(2.11)	(2.04)	(2.06)
RavenPack Release * D(HRH)	1.232***	1.201***	1.265***	1.184***	0.132	0.112	0.114	0.119
	(2.79)	(2.85)	(3.02)	(2.90)	(0.98)	(0.81)	(0.80)	(0.84)
RavenPack Release * Sentiment Direction					-0.305**	-0.312**	-0.288*	-0.290*
					(-1.99)	(-2.03)	(-1.86)	(-1.89)
RavenPack Release * Sentiment					0.090	0.083	0.127	0.125
					(0.88)	(0.81)	(1.22)	(1.21)
D(HRH)	0.045	0.049	-0.085	-0.035	0.071	0.079	0.014	0.013
	(0.17)	(0.19)	(-0.32)	(-0.13)	(0.73)	(0.81)	(0.14)	(0.13)
Sentiment Direction					0.416***	0.415**	0.202**	0.206**
					(4.23)	(4.23)	(2.03)	(2.07)
Company size		1.387***	1.435***	1.494***		-0.332***	-0.311***	-0.305***
		(12.47)	(12.82)	(13.25)		(-6.02)	(-5.71)	(-5.60)
Return prior month		4.228	4.486	3.832		-11.471***	-12.427***	-11.278***
		(0.76)	(0.81)	(0.69)		(-3.32)	(-3.61)	(-3.27)
Volatility prior month		-0.008**	-0.007***	-0.007***		0.005**	0.006***	0.003*
		(-3.08)	(-2.82)	(-2.86)		(2.55)	(3.01)	(1.79)
Turnover prior month		0.058	0.075	0.077		-0.017	-0.001	-0.008
		(1.00)	(1.28)	(1.29)		(-0.63)	(-0.04)	(-0.29)
Illiquidity prior month		-0.015***	-0.014***	-0.012**		-0.006**	-0.005**	-0.006***
		(-2.84)	(-2.61)	(-2.28)		(-2.53)	(-2.45)	(-2.67)
Absolute Composite Sentiment Score			-0.028***	-0.027***				
			(-2.89)	(-2.82)				
Neutral Composite Sentiment Score			-0.144*	-0.164**				
			(-1.94)	(-2.25)				
Absolute Event Sentiment Score			0.024***	0.023**				
			(2.65)	(2.57)				
Neutral Event Sentiment Score			-0.647**	-0.672**				
			(-2.08)	(-2.21)				
Article category identified			-6.919**	-6.855**		0.664***	0.628**	
			(-2.25)	(-2.20)		(2.82)	(2.50)	
Time since last article			0.123***	0.111***		0.163***	0.164***	
			(6.42)	(5.88)		(12.93)	(13.04)	
Number of firms in article			-0.180***	-0.202***		-0.200***	-0.199***	
			(-3.81)	(-4.41)		(-10.77)	(-10.69)	
Absolute market return t-1, t+5				3.361***				0.180***
				(16.59)				(3.83)
Absolute industry return t-1, t+5				0.038				-0.281***
				(0.38)				(-6.95)
Market turnover t-1, t+5				151.170***				-6.372**
				(10.49)				(-2.10)
Industry turnover t-1, t+5				27.920***				3.104**
				(5.74)				(2.02)
Market volatility t-1, t+5				-0.751***				-0.251***
				(-10.80)				(-8.29)
Industry volatility t-1, t+5				0.579***				0.370***
				(12.99)				(10.76)
Absolute market return t-1, t+120				-0.128***				
				(-8.13)				
Absolute industry return t-1, t+120				-0.070***				
				(-5.07)				
Market turnover t-1, t+120				-4.449***				
				(-7.24)				
Industry turnover t-1, t+120				-1.562***				
				(-5.22)				
Market volatility t-1, t+120				0.149**				
				(2.21)				
Industry volatility t-1, t+120				-0.381***				
				(-8.19)				
Number of Observations	649435	649247	649247	649247	804002	803725	803725	803725
R ²	0.031	0.032	0.034	0.071	0.046	0.047	0.051	0.052
Relevance, Category and Hour F.E.	No	No	Yes	Yes	No	No	Yes	Yes
Date and Firm Fixed Effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes

Panel C: Industry Adjusted Returns

Dependent Variable:	Speed of Stock Price Response – Industry adjusted				Industry adjusted return t-1, t+5			
	(1)	(1b)	(1c)	(2)	(5)	(5b)	(5c)	(6)
RavenPack Release * D(HRH) * Sentiment Dummy					0.320**	0.323**	0.314*	0.314**
					(2.01)	(2.02)	(1.95)	(1.97)
RavenPack Release * D(HRH)	1.015**	0.984**	1.037**	0.999**	0.130	0.110	0.112	0.116
	(2.12)	(2.16)	(2.28)	(2.29)	(0.96)	(0.79)	(0.78)	(0.82)
RavenPack Release * Sentiment Direction					-0.294*	-0.301*	-0.277*	-0.279*
					(-1.91)	(-1.96)	(-1.78)	(-1.81)
RavenPack Release * Sentiment					0.097	0.090	0.134	0.132
					(0.95)	(0.88)	(1.28)	(1.27)
D(HRH)	0.185	0.193	0.076	0.126	0.069	0.077	0.013	0.013
	(0.69)	(0.73)	(0.29)	(0.48)	(0.71)	(0.78)	(0.13)	(0.13)
Sentiment Direction					0.408***	0.407***	0.193*	0.197**
					(4.14)	(4.14)	(1.93)	(1.97)
Company size		1.471***	1.517***	1.539***		-0.338***	-0.317***	-0.311***
		(13.05)	(13.38)	(13.53)		(-6.14)	(-5.83)	(-5.72)
Return prior month		-5.310	-5.274	-2.241		-11.186***	-12.136***	-11.013***
		(-0.94)	(-0.94)	(-0.40)		(-3.23)	(-3.51)	(-3.18)
Volatility prior month		-0.003	-0.002	-0.006**		0.005**	0.005***	0.003*
		(-1.21)	(-0.93)	(-2.32)		(2.52)	(2.98)	(1.79)
Turnover prior month		0.077	0.095	0.085		-0.017	-0.001	-0.008
		(1.32)	(1.60)	(1.41)		(-0.64)	(-0.05)	(-0.29)
Illiquidity prior month		-0.011**	-0.009*	-0.009*		-0.006**	-0.006**	-0.006**
		(-2.00)	(-1.80)	(-1.83)		(-2.62)	(-2.54)	(-2.76)
Absolute Composite Sentiment Score			-0.029***	-0.027***				
			(-2.87)	(-2.76)				
Neutral Composite Sentiment Score			-0.117	-0.129*				
			(-1.60)	(-1.79)				
Absolute Event Sentiment Score			0.027***	0.024***				
			(2.81)	(2.60)				
Neutral Event Sentiment Score			-0.303	-0.376				
			(-0.93)	(-1.17)				
Article category identified			-4.221	-5.008		0.782***	0.752**	
			(-1.25)	(-1.50)		(2.83)	(2.55)	
Time since last article			0.124***	0.114***		0.163***	0.165***	
			(6.57)	(6.14)		(12.95)	(13.06)	
Number of firms in article			-0.151***	-0.180***		-0.198***	-0.197***	
			(-3.38)	(-4.14)		(-10.66)	(-10.59)	
Absolute market return t-1, t+5				-0.355**				0.204***
				(-2.50)				(4.38)
Absolute industry return t-1, t+5				3.339***				-0.294***
				(21.52)				(-6.92)
Market turnover t-1, t+5				136.341***				-5.973*
				(11.17)				(-1.87)
Industry turnover t-1, t+5				34.666***				2.215
				(6.93)				(1.37)
Market volatility t-1, t+5				-0.611***				-0.253***
				(-10.36)				(-8.60)
Industry volatility t-1, t+5				0.471***				0.370***
				(10.28)				(10.80)
Absolute market return t-1, t+120				0.003				
				(0.24)				
Absolute industry return t-1, t+120				-0.184**				
				(-16.36)				
Market turnover t-1, t+120				-4.524***				
				(-8.19)				
Industry turnover t-1, t+120				-1.383***				
				(-4.42)				
Market volatility t-1, t+120				0.268***				
				(4.20)				
Industry volatility t-1, t+120				-0.524***				
				(-11.59)				
Number of Observations	649435	649247	649247	649247	804002	803725	803725	803725
R ²	0.031	0.032	0.034	0.072	0.046	0.047	0.051	0.052
Relevance, Category and Hour F.E.	No	No	Yes	Yes	No	No	Yes	Yes
Date and Firm Fixed Effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes