

## Internet Appendix for “Voice and Action: Sell-Side Analysis and Hedge Fund Activism”

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### Appendix I – Analyst Perception of Target Firms’ Prospects

This table reports the univariate difference-in-difference test. TP/P is target price divided by stock price; EST/ACT is earnings estimate divided by actual earnings. A more detailed description of the variables is in Appendix A. We limit the sample of analysis within 12 months before and after hedge fund intervention.

	Treatment Group (Target Firms)		Control Group (Matched Firms)			
	Mean		Mean		Cross-Sectional Difference	
Pre Targeting					Mean Difference	t-stat
TP/P	2.027		2.162		-0.135	-1.35
EST/ACT	0.846		1.004		-0.158***	-6.50
Post Targeting						
TP/P	2.415		1.818		0.597***	6.30
EST/ACT	1.067		0.943		0.124***	5.40
Post - Pre	Time-series Estimator	t-stat	Time-series Estimator	t-stat	DID Estimator	t-stat
TP/P	0.388***	3.83	-0.344***	-3.65	0.732***	5.30
EST/ACT	0.221***	8.93	-0.0614**	-2.71	0.282***	8.42

## Appendix II – Univariate DID Test on Sentiment in Conference Calls

### *Panel A: Tone Analysis on Earnings Conference Calls*

This panel reports univariate difference-in-difference test on sentiment of earnings conference calls. Textual analysis is performed using the positive, negative, net (positive-negative), and uncertainty dictionaries of Loughran and McDonald (2011). A detailed description of the variables is in Appendix A. We limit the sample of analysis within 12 months before and after hedge fund intervention.

	Treatment Group (Target Firms)		Control Group (Matched Firms)		Cross-Sectional difference	
	Mean		Mean		Mean Difference	t-stat
<b>Pre Targeting</b>						
POS	1.314%		1.266%		0.048%***	3.37
NEG	1.077%		1.088%		-0.0112%	-0.91
NET_POS	0.237%		0.176%		0.060%**	2.93
UNCT	0.889%		0.942%		-0.053%***	-6.37
POS_QNA	1.125%		1.106%		0.019%	1.27
NEG_QNA	0.979%		0.998%		-0.018%	-1.45
NET_POS_QNA	0.145%		0.108%		0.038%*	1.81
UNCT_QNA	0.924%		0.991%		-0.067%***	-5.92
<b>Post Targeting</b>						
POS	1.309%		1.274%		0.036%*	2.37
NEG	1.086%		1.047%		0.040%**	3.16
NET_POS	0.224%		0.226%		-0.002%	-0.08
UNCT	0.893%		0.931%		-0.037%***	-4.09
POS_QNA	1.112%		1.119%		-0.007%	-0.47
NEG_QNA	0.975%		0.957%		0.017%	1.31
NET_POS_QNA	0.139%		0.162%		-0.023%	-1.07
UNCT_QNA	0.925%		0.962%		-0.037%**	-3.07
<b>Post - Pre</b>	Time-series Estimator	t-stat	Time-series Estimator	t-stat	DID Estimator	t-stat
POS	-0.005%	-0.31	0.008%	0.53	-0.012%	-0.59
NEG	0.009%	0.73	-0.042%***	-3.31	0.051%***	2.87
NET_POS	-0.013%	-0.60	0.049%*	2.40	-0.062%**	-2.10
UNCT	0.005%	0.54	-0.011%	-1.28	0.016%	1.28
POS_QNA	-0.013%	-0.84	0.013%	0.88	-0.027%	-1.21
NEG_QNA	-0.005%	-0.36	-0.040%**	-3.12	0.036%*	1.95
NET_POS_QNA	-0.007%	-0.30	0.054%**	2.58	-0.061%**	-2.02
UNCT_QNA	0.001%	0.09	-0.030%*	-2.52	0.000%*	1.85

*Panel B: Tone Analysis on Analyst Reports*

This panel reports univariate difference-in-difference test. The variables of test are the different tones of dictionary words used in analyst reports issued one month before and after intervention events.

	Treatment Group (Target Firms)		Control Group (Matched Firms)			
	Mean		Mean		Cross-Sectional difference	
					Mean Difference	t-stat
<i>Pre Targeting</i>						
POS	1.8%		2.2%		-0.4%***	-3.19
NEG	5.3%		5.5%		-0.3%	-1.57
NET_POS	-3.5%		-3.3%		-0.1%	-0.72
UNCT	3.0%		3.0%		-0.0%	-0.15
<i>Post Targeting</i>						
POS	2.1%		2.4%		-0.2%*	-1.73
NEG	5.8%		4.8%		1.0%***	5.78
NET_POS	-3.7%		-2.4%		-1.2%***	-6.26
UNCT	3.5%		3.0%		0.5%**	2.05
<i>Post - Pre</i>	Time-series Estimator	t-stat	Time-series Estimator	t-stat	DID Estimator	t-stat
POS	0.4%***	4.24	0.2%	0.92	0.2%	1.02
NEG	0.6%***	4.23	-0.7%***	-3.44	1.3%***	5.21
NET_POS	0.2%	1.29	0.9%***	3.70	-1.1%***	-3.95
UNCT	0.5%**	2.87	-0.0%	-0.01	0.5%	1.56

**Appendix III – Univariate DID Tests of Dictionary Words in Analyst Reports** (*including missing analyst reports*)

This table reports univariate DID tests of activism dictionary. The variables of interest are the average percentage of activism dictionary words used in analyst reports issued within different time windows. For example, Pre-targeting *DIC* (*one month*) is the average percentage of activism dictionary words used in analyst reports issued one month before targeting events. *For firms without analyst coverage, we replace the missing value of variables with zero.* The activism dictionary is based on the objectives and tactics of Brav, et al. (2008). A complete list of dictionary words is available in Appendix B.

	Treatment Group (Target Firms)		Control Group (Matched Firms)		Cross-Sectional difference	
	N	Mean	N	Mean	Mean Difference	t-stat
Pre Targeting						
DIC (one month)	5303	6.997%	3592	6.628%	0.368%**	3.05
DIC (two months)	9454	6.948%	7013	6.645%	0.303%***	3.45
DIC (three months)	14045	7.022%	10773	6.700%	0.322%***	4.44
DIC (six months)	23595	7.069%	18089	6.818%	0.251%***	4.46
DIC (nine months)	32162	7.112%	25025	6.842%	0.271%***	5.61
Post Targeting						
DIC (one month)	4683	6.672%	3604	6.813%	-0.141%	-1.10
DIC (two months)	7959	6.685%	6596	6.907%	0.222%*	2.32
DIC (three months)	10959	6.813%	8924	6.905%	0.092%	1.12
DIC (six months)	18741	6.813%	15931	6.874%	0.061%	0.99
DIC (nine months)	26338	6.810%	22872	6.853%	0.044%	0.85
Post - Pre	Time-series Estimator	t-stat	Time-series Estimator	t-stat	DID Estimator	t-stat
DIC (one month)	- 0.325%**	-2.85	0.185%	1.37	-0.509%**	-2.89
DIC (two months)	-0.263%**	-3.08	0.262%**	2.68	-0.081%***	-4.05
DIC (three months)	-0.208%**	-2.85	0.206%*	2.53	-0.230%***	-3.79
DIC (six months)	0.256%***	-4.6	0.056%	0.90	-0.190%***	-3.74
DIC (nine months)	-0.303%***	-6.41	0.012%	0.22	-0.227%***	-4.46

#### Appendix IV – Multivariate DID on Returns around Analyst Reports (*Multiple Activists*)

This table presents OLS regression of CAR around issuance of analyst reports within five to ninety days before (or after in Model (2)) targeting events. In both columns, the dependent variable CAR is computed from one day before issuance of analyst reports to one day after. In column (1), the variable of interest *TREAT* indicates whether it is in the control group or treatment group. In column (2), *POST* is an indicator variable that takes the value of one if year *t* is after a firm being targeted by hedge fund activists, and zero otherwise. *TREAT* is defined the same as in column (1). The variable of interest is the interaction term *TREAT\*POST*. *ROA* is net income divided by total assets. *LNMV* is natural logarithm of market capitalization. *LTDEBT* is the ratio of long-term debt to the sum of debt and market value of equity. *BTM* is book to market ratio. *MISS* is an indicator variable that equals one if the actual EPS is less than the last consensus EPS forecast, and zero otherwise. A more detailed description of the variables is in Appendix A. P-values are based on standard errors clustered at the firm level

	Nine months before intervention	Six months before intervention	Three months before intervention
VARIABLES	(1) CAR [-1, +1]	(2) CAR [-1, +1]	(3) CAR [-1, +1]
DIC_HIGH	0.008* (1.713)	0.010** (2.094)	0.009* (1.758)
ROA	-0.045*** (-2.830)	-0.045*** (-2.677)	-0.046** (-2.584)
LNMV	0.004 (1.372)	0.004 (1.364)	0.005* (1.675)
LTDEBT	-0.016 (-0.886)	-0.016 (-0.916)	-0.015 (-0.824)
BTM	-0.006 (-1.231)	-0.004 (-0.964)	-0.003 (-0.786)
MISS	-0.001 (-0.120)	0.001 (0.090)	-0.000 (-0.036)
MULTIACTIV	0.042** (2.168)	0.042** (2.197)	0.036* (1.951)
Constant	-0.041* (-1.923)	-0.042* (-1.930)	0.045* (1.769)
Observations	13,124	8,990	4,765
Adjusted R <sup>2</sup>	0.095	0.100	0.111
Brokerage Firm Fixed Effects	YES	YES	YES

## Appendix V – Multivariate DID Regression on Analyst Coverage by Geographical Distance

This table reports results from DID OLS regressions. The dependent variables are measures of analyst coverage. The variable of interest *POST* is an indicator variable that takes the value of one if year *t* is after a firm being targeted by hedge fund activists, and zero otherwise. *ROA* is net income divided by total assets. *SIZE* is the natural logarithm of total assets. *BTM* is book to market ratio. *MISS* is an indicator variable that equals one if the actual EPS is less than the last consensus EPS forecast, and zero otherwise. A more detailed description of the variables is in Appendix A. The samples are analyst reports for treatment group issued within three months (or one quarter) before and after hedge fund intervention. The subsample “Short Distance” consists of below-median distance, while the subsample “Long Distance” consists of above-median distance. P-values are based on standard errors clustered at the firm level.

VARIABLES	Short Distance	Long Distance	Short Distance	Long Distance	Short Distance	Long Distance
	(1)	(2)	(3)	(4)	(5)	(6)
	NUM_PAGE	NUM_PAGE	NUM_WORD	NUM_WORD	NUM_REP	NUM_REP
POST	-0.297*	-0.102	-0.167*	-0.071	-1.410*	-1.266**
	(-1.690)	(-0.578)	(-1.775)	(-0.853)	(-1.695)	(-2.570)
ROA	2.513	-10.343	-6.888	-1.144	1.602	1.978
	(0.145)	(-0.604)	(-0.643)	(-0.212)	(0.175)	(0.406)
SIZE	0.720	-4.410	-0.148	-0.628	0.751	-0.991
	(0.428)	(-0.944)	(-0.131)	(-0.484)	(0.901)	(-0.886)
BTM	-0.690	-2.275	-1.550	-0.723	0.201	1.433**
	(-0.416)	(-1.124)	(-1.522)	(-1.321)	(0.208)	(2.477)
MISS	-0.178	-0.790*	0.010	-0.360*	-1.364	1.112
	(-0.571)	(-1.766)	(0.054)	(-1.858)	(-0.963)	(1.030)
Constant	3.489	40.715	6.750	9.010	13.622*	19.070**
	(0.253)	(1.256)	(0.733)	(0.989)	(1.925)	(2.454)
Observations	5,449	5,512	5,361	5,431	4,997	5,083
R-squared	0.126	0.294	0.144	0.264	0.646	0.702
Firm Fixed Effect	YES	YES	YES	YES	YES	YES

## Appendix VI – Event Study on Analyst Reports before Targeting

### *Panel A: Event Study on Analyst Reports of Treatment Group before Targeting*

This panel reports event study of issuance of sell-side analyst reports of treatment group firms before event dates. We select analyst reports that are issued within five to ninety days before targeting event dates. To mitigate confounding effects, we exclude reports issued five days before targeting event dates and limit testing windows of CAR within five days.

Windows	N	Market model, value-weighted index			Fama-French Model, value-weighted index		
		CAR	Patell Z	p-value	CAR	Patell Z	p-value
(-5,+5)	2940	-1.04%***	-4.45	<.0001	-0.99%***	-3.538	0.000
(-2,+2)	2940	-1.38%***	-7.64	<.0001	-0.89%***	-4.453	<.0001
(-1,+1)	2940	-1.33%***	-9.19	<.0001	-0.77%***	-4.615	<.0001

### *Panel B: Event Study on Analyst Reports of Control Group before Targeting*

This panel reports event study of issuance of sell-side analyst reports of control group firms before event dates. We select analyst reports that are issued within five to ninety days before targeting event dates. To mitigate confounding effects, we exclude reports issued five days before targeting event dates and limit testing windows of CAR within five days.

Windows	N	Market model, value-weighted index			Fama-French Model, value-weighted index		
		CAR	Patell Z	p-value	CAR	Patell Z	p-value
(-5,+5)	2479	-0.40%	-1.46	0.072	-0.31%	-1.227	0.110
(-2,+2)	2479	-0.35%	-0.14	0.445	-0.12%	-0.250	0.401
(-1,+1)	2479	-0.32%	1.22	0.111	0.00%	0.587	0.279

## Appendix VII – Changes in Analyst Coverage with Brokerage Firm and Firm Fixed Effects

This table reports results from DID OLS regressions with brokerage firm and firm fixed effects. *NUM\_REPORT* is the aggregate number of analyst reports issued each month for a given firm. *NUM\_PAGE* (*NUM\_WORD*) is the number of pages (words, in thousands) in each report. *POST* is an indicator variable that takes the value of one if year *t* is after a firm being targeted by hedge fund activists, and zero otherwise. *TREAT* is an indicator variable that takes the value of one if the firm has been targeted during the sample period (treatment group), zero otherwise (control group). The variable of interest is the interaction term *TREAT\*POST*. *ROA* is net income divided by total assets. *SIZE* is the natural logarithm of total assets. *BTM* is book to market ratio. *MISS* is an indicator variable that equals one if the actual EPS is less than the last consensus EPS forecast, and zero otherwise. A more detailed description of the variables is in Appendix A. The samples are within three months (or one quarter) before and after hedge fund intervention. P-values are based on standard errors clustered at the firm level.

VARIABLES	(1) NUM_REPORT	(2) NUM_PAGE	(3) NUM_WORD
TREAT	-1.165 (-1.506)	1.211** (2.089)	0.333 (1.187)
POST	-0.533*** (-5.146)	-0.018 (-0.145)	-0.015 (-0.274)
TREAT*POST	-0.040 (-0.238)	-0.439** (-2.088)	-0.152* (-1.876)
ROA	0.155 (0.194)	-1.603 (-1.282)	-0.944** (-2.081)
SIZE	0.740** (2.220)	0.539 (0.704)	0.451* (1.811)
BTM	-0.147 (-0.636)	-0.571 (-1.114)	-0.409* (-1.689)
MISS	0.392 (1.363)	-0.084 (-0.702)	-0.013 (-0.239)
Constant	-2.325 (-0.919)	-1.420 (-0.253)	-0.679 (-0.374)
Observations	15,310	47,782	47,782
R-squared	0.546	0.461	0.381
Brokerage Firm Fixed Effects	YES	YES	YES
Firm Fixed Effects	YES	YES	YES