IMPACT OF WIKIPEDIA ON MARKET INFORMATION ENVIRONMENT: EVIDENCE ON MANAGEMENT DISCLOSURE AND INVESTOR REACTION

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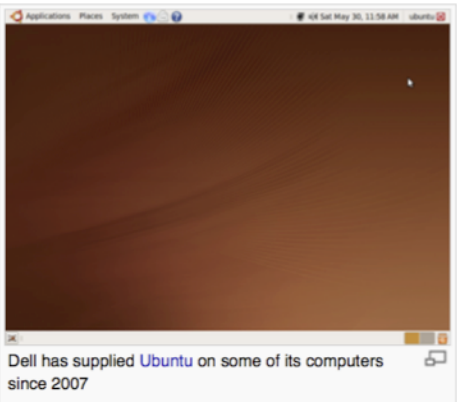Clear Water Bay, HONG KONG {zhang@ust.hk}

Appendix A

Example of Information Aggregation on Wikipedia

Ubuntu on Dell systems   [edit]

On February 26, 2007 Dell announced that it had commenced a program to sell and distribute a range of computers with pre-installed Linux distributions as an alternative to Microsoft Windows. Dell indicated that Novell's SUSE Linux would appear first.[26] However, Dell on February 27, 2007 announced that its previous announcement related to certifying the hardware as ready to work with Novell SUSE Linux and that it (Dell) had no plans to sell systems pre-installed with Linux in the near future.[27] On March 28, 2007, Dell announced that it would begin shipping some desktops and laptops with Linux pre-installed, although it did not specify which distribution of Linux or which hardware would lead.[28] On April 18, 2007 a report appeared suggesting that Michael Dell used Ubuntu on one of his home systems.[29] On May 1, 2007, Dell announced it would ship the Ubuntu Linux distribution.[30] On May 24, 2007, Dell started selling models with Ubuntu Linux 7.04 pre-installed: a laptop, a budget computer, and a high-end PC.[31]

On June 27, 2007, Dell announced on its Direct2Dell blog that it planned to offer more pre-loaded systems (the new Dell Inspiron desktops and laptops). After the IdeaStorm site supported extending the bundles beyond the US market, Dell later announced more international marketing.[32] On August 7, 2007, Dell officially announced that it would offer one notebook and one desktop in the UK, France and Germany with Ubuntu "pre-installed". At LinuxWorld 2007 Dell announced plans to provide Novell's SUSE Linux Enterprise Desktop on selected models in China, "factory-installed".[33] On November 30, 2007 Dell reported shipping 40,000 Ubuntu PCs.[34] On January 24, 2008 Dell in Germany, Spain, UK and France launched a second laptop, a XPS M1330 with Ubuntu 7.10, for 849 euro or GBP 599 upwards.[35] On February 18, 2008, Dell announced that the Inspiron 1525 would have Ubuntu as an optional operating system.[citation needed] On February 22, 2008 Dell announced plans to sell Ubuntu in Canada and in Latin America.[36] From September 16, 2008, Dell has shipped both Dell Ubuntu Netbook Remix and Windows XP Home versions of the Inspiron Mini 9 and the Inspiron Mini 12. As of 2009 Dell ships the Inspiron Mini 9 and the Inspiron Mini 12 laptops with Ubuntu version 8.04.[citation needed] Unsourced speculation[who?] opines that in the future[weasel words] Dell will offer Ubuntu 8.10 on the Mini 9 and Mini 12.

Dell has supplied Ubuntu on some of its computers since 2007

Source: http://en.wikipedia.org/wiki/Dell, accessed in January, 2010 (emphasis added).

Appendix B

Literature Review: Information Aggregation Mechanisms ████████████

Information aggregation mechanisms	Evidence and implications	How does information aggregation on Wikipedia differ from previous mechanisms?
Combining analyst forecasts	• Financial analysts as the foremost source of quantified information for investors (Abarbanell et al. 1995; Francis et al. 1997; Healy and Palepu 2001; Kasznik and Lev 1995; Lang and Lundholm 1996; Roulstone 2003; Skinner 1994, 1997). • Analyst forecasts, on average, are subject to upward bias (Francis et al. 1997; Karamanou and Vafeas 2005; Lang and Lundholm 1996; Roulstone 2003).	Wikipedia provides detailed qualitative information about firm operations, and information aggregation on Wikipedia retains information of neutral-point-of-view. This is different than analyst forecasts which are often subject to an upward bias.
A unified depository to store news and discussions (e.g., online message boards)	• Antweiler and Frank (2004) examined 1.5 million messages posted on online stock message boards. Collectively online messages affect trading activities in the market, suggesting that online messages provide information to investors. • Investors, however, may bear high costs of processing the large volume of information, i.e., the huge number of online messages (Gu et al. 2007).	Wikipedia contributors modify the same entry about a company, through which they aggregate information. Users, therefore, use a synthesized set of information, so they do not bear high costs of processing information.
Collective reporting by community participants	• Gu et al. (2007) examined 500,000 postings from three virtual investing-related communities (VICs). They showed that investors value high-quality postings. • "One approach VIC providers use to improve posting quality is to actively monitor and filter low-quality postings…allowing users to report abusive postings, which are then investigated manually by VIC providers" (Gu et al. 2007, p. 74).	Wikipedia removes noise in a decentralized way (i.e., by individual contributors). Also, information aggregation on Wikipedia involves, but not limited to, user screening to remove noise.
Corporate website	• Geerings et al. (2003) examined the "investor relations" webpage of 50 large companies. • On the corporate webpage of investor relations, "information available through other sources is combined to better inform investors" (Geerings et al. 2003 p. 567).	Wikipedia is a typical example of "wisdom of crowds" which is in sharp contrast to the "investor relations" section on corporate website, where companies select what information to present.

Appendix C

An Example of "Wikipedia Page History Statistics" ▮▮▮▮▮▮

Page title:	Apple Inc.
Total revisions:	9,903
Number of minor edits:	2,770 (27.97%)
Number of IP edits:	3,141 (31.72%)
First edit:	03 November 2001, 13:19:06 (by 212.53.104.xxx)
Most recent edit:	16 March 2012, 19:10:01
Average time between edits:	0.38 days
Average number of edits per month:	79.56
Average number of edits per year:	954.73
Number of edits in the last day:	0
Number of edits in the last week:	2
Number of edits in the last month:	45
Number of edits in the last year:	507
Number of users:	4,530
Average edits per user:	2.19
Number of edits made by the top 10% of active users:	4,601 (46.46%)

Source: http://toolserver.org/~petrb/soxred/articleinfo/index.php?article=Apple_Inc.&lang=en&wiki=wikipedia (accessed March 22, 2012)

Appendix D

Instrumental Variable (IV) Estimation ▮▮▮▮▮▮

We examine the possible endogeneity of Wikipedia modifications. First, managers may release information through Wikipedia themselves. If a manager decides to release information through Wikipedia, and if the decision to edit the entry correlates with the decision about disclosure lag (for example, because of an incentive to release information to the public), then the manager's self-editing may confound social media's effect. Second, if there exists an alternative information channel that influences both Wikipedia modifications and disclosure lags, then the identified effect cannot be attributed to Wikipedia. We employ two instrument variables for the possibly endogeneous variable *WikiMOD*.

We first consider *WikiMOD* from the previous quarter. It is correlated with *WikiMOD* of the current quarter because contributors' efforts spent on a firm's entry in a quarter are related to those in previous quarters. Since *LAG* is a variable contingent on a firm's quarterly performance, it is unlikely related to any modifications of the Wikipedia entry before the focal fiscal quarter.

We can also consider an alternative instrument as follows: For a firm's modifications in one quarter, we first identify the contributors. Then, we count the number of modifications that these contributors made on Wikipedia, but on different topics (i.e., entries other than companies). This instrument is correlated with *WikiMOD* because they both represent the degree to which the contributors add content to Wikipedia. This instrument is unlikely to be related to *LAG* because the instrument is about modifications on entries other than companies. Therefore, it is unlikely related to *LAG*.

In sum, the two instruments satisfy the two conditions for valid IV (i.e., correlated with the possibly endogenous variable while uncorrelated with regression residuals). In the below table, we follow Terza e al. (2008) and implement IV analysis using the software package R and the function coxph. We obtain results for *WikiMOD* that are highly consistent with results from our main analysis (Table 3). Hence, this IV approach gives us confidence that our main results are not due to alternative explanations.

Table D1. Results of IV Regressions (Regression specification is based on model (1) in text. Variable definitions are in Table 1.)				
	Aggregation Via Wikipedia	**Number of News Articles**	**Content of News (Positive & Negative Words)**	
	(1)	**(2)**	**(3)**	**(4)**
Wikipedia Modifications	–0.1791**	–0.1170	–0.1435*	–0.1153
(*WikiMOD*)	(0.1064)	(0.1095)	(0.1122)	(0.1131)
WikiMOD*DISPERSION	**–0.1395****	**–0.1505*****	**–0.3500*****	**–0.3470*****
	(0.0623)	**(0.0584)**	**(0.0990)**	**(0.1309)**
WikiMOD*BIAS	**0.0617*****	**0.0669*****	**0.1033*****	**0.0992*****
	(0.0140)	**(0.0128)**	**(0.0227)**	**(0.0411)**
Analyst Dispersion	0.1275***	0.1653**	–0.0816	–0.0484
(*DISPERSION*)	(0.0498)	(0.0921)	(0.1487)	(0.1918)
Analyst Bias	0.0392***	–0.0325**	0.0116	0.0093
(*BIAS*)	(0.0150)	(0.0169)	(0.0285)	(0.0464)
Number of News Articles		–0.0973*	–0.0957*	–0.0955*
(*NEWS*)		(0.0669)	(0.0678)	(0.0695)
*NEWS*DISPERSION*		0.0618	0.2551**	0.2496
		(0.0670)	(0.1539)	(0.2025)
*NEWS*BIAS*		–0.0109	–0.0557**	–0.0533
		(0.0137)	(0.0304)	(0.0474)
Negative Words			–0.0821**	–0.0928*
(*NEGATIVE*)			(0.0481)	(0.0651)
*NEGATIVE*DISPERSION*			0.2862***	0.2664*
			(0.1102)	(0.1755)
*NEGATIVE*BIAS*			–0.0670*	–0.0518
			(0.0481)	(0.0797)
Positive Words				–0.0576
(*POSITIVE*)				(0.0543)
*POSITIVE*DISPERSION*				–0.0207
				(0.1740)
*POSITIVE*BIAS*				–0.0050
				(0.0784)
Earnings Variability	–0.1232***	–0.1098***	–0.0918***	–0.0923***
(*VAR*)	(0.0270)	(0.0294)	(0.0329)	(0.0317)
Market Value	–0.2570***	–0.2336***	–0.2315***	–0.2485***
(*MV*)	(0.0872)	(0.0889)	(0.0855)	(0.0921)
High-tech	0.2446	0.1491	0.1934	0.1622
(*HIGHTECH*)	(0.1712)	(0.1870)	(0.1823)	(0.1986)
Regulation	–0.1929	–0.1100	–0.1385	–0.0882
(*REG*)	(0.2487)	(0.2757)	(0.2835)	(0.2764)
Quarter 1 Dummy	–0.5729***	–0.5456***	–0.4961**	–0.4320**
(*Q1*)	(0.2108)	(0.2127)	(0.2177)	(0.2251)
Quarter 2 Dummy	–0.1254	–0.1368	–0.0816	–0.1071
(*Q2*)	(0.2000)	(0.2064)	(0.2111)	(0.2055)
Quarter 3 Dummy	–0.5389***	–0.5425***	–0.5600***	–0.4846**
(*Q3*)	(0.2083)	(0.2069)	(0.2061)	(0.2277)
Observations	161	161	161	161
Likelihood Ratio Test	p < 0.001	p = 0.001	p = 0.002	p = 0.004
Pseudo R-Squared	0.205	0.215	0.230	0.236

Note: Robust estimates of standard errors are reported in parentheses. Significance levels are one-tailed for directional predictions and two-tailed otherwise. *p < 0 10; **p < 0.05; ***p < 0.01. The pseudo R^2 refers to Nagelkerke's (1991) R^2.

Appendix E

Regressions Controlling for Firm Visibility Based on (1) Firm Characteristics and (2) Google Search Volume Index (SVI) ▆▆▆▆▆

In this appendix we report how our results remain unchanged after controlling for firm visibility as we discuss in the "Additional Analysis" subsection of the "Results." Column (1) in the following table replicates the estimates we obtain in Column (5) of Table 3. In Column (2), we add common controls for firm visibility based on firm characteristics that we identify from the literature. Column (3) further considers Google search volume index (SVI). The regression specification is based on model (1) in text. Variable definitions are in Table 1.

	Base Model	Base Model + Controls for Visibility Based on Firm Characteristics	Base Model + Controls for Visibility Based on Firm Characteristics + Google SVI
	(1)	(2)	(3)
Wikipedia Modifications	–0.1206*	–0.2353***	0.0185
(*WikiMOD*)	(0.0737)	(0.1017)	(0.1744)
WikiMOD*DISPERSION	**–0.3473***	**–0.3797**	**–1.1473***
	(0.1308)	**(0.1863)**	**(0.4592)**
WikiMOD*BIAS	**0.0990***	**0.0615**	**0.4168***
	(0.0408)	**(0.0498)**	**(0.2571)**
Analyst Dispersion	–0.0508	–0.1836	0.2559
(*DISPERSION*)	(0.1890)	(0.2488)	(0.3764)
Analyst Bias	0.0091	–0.0343	0.0392
(*BIAS*)	(0.0460)	(0.0716)	(0.1394)
Number of News Articles	–0.0947*	0.1166	0.0836
(*NEWS*)	(0.0702)	(0.1034)	(0.2104)
*NEWS*DISPERSION*	0.2476	0.3783	1.7293***
	(0.1960)	(0.2409)	(0.6382)
*NEWS*BIAS*	–0.0531	0.0028	–0.3524*
	(0.0469)	(0.0499)	(0.2535)
Negative Words	–0.0929*	–0.1436**	–0.1962*
(*NEGATIVE*)	(0.0650)	(0.1008)	(0.1202)
*NEGATIVE*DISPERSION*	0.2661*	0.4015**	1.1486***
	(0.1748)	(0.2258)	(0.4829)
*NEGATIVE*BIAS*	–0.0519	–0.0730	–0.2692***
	(0.0800)	(0.1013)	(0.0963)
Positive Words	–0.0571	–0.0170	–0.0497
(*POSITIVE*)	(0.0545)	(0.0740)	(0.0762)
*POSITIVE*DISPERSION*	–0.0201	0.1279	0.5186
	(0.1730)	(0.2287)	(0.5118)
*POSITIVE*BIAS*	–0.0052	0.0032	–0.1257
	(0.0779)	(0.0695)	(0.1698)
Earnings Variability	–0.0922***	–0.5048**	–0.3179
(*VAR*)	(0.0316)	(0.2843)	(0.3472)
Market Value	–0.2489***	–0.1761*	–0.1872*
(*MV*)	(0.0913)	(0.1338)	(0.1252)
High-tech	0.1664	–0.1728	–0.2020
(*HIGHTECH*)	(0.1935)	(0.2916)	(0.3074)

	Base Model	Base Model + Controls for Visibility Based on Firm Characteristics	Base Model + Controls for Visibility Based on Firm Characteristics + Google SVI
	(1)	(2)	(3)
Regulation	−0.0957	−0.0780	−0.1151
(*REG*)	(0.2587)	(0.6797)	(0.5917)
Quarter 1 Dummy	−0.4338**	−0.5117**	−0.4272*
(*Q1*)	(0.2211)	(0.2871)	(0.2809)
Quarter 2 Dummy	−0.1051	−0.2637	−0.1654
(*Q2*)	(0.2069)	(0.2751)	(0.3294)
Quarter 3 Dummy	−0.4858**	−0.6049***	−0.9893***
(*Q3*)	(0.2251)	(0.2881)	(0.2653)
NYSE Listing		−0.5192**	−0.8105**
(*NYSE*)		(0.3326)	(0.3600)
Analyst Following		−0.0278**	−0.0292**
(*ANALYST*)		(0.0171)	(0.0173)
Institutional Ownership		0.2344	−0.2389
(*IO*)		(0.5275)	(0.6926)
Firm Profitability		−2.1351**	−1.7059*
(*ROA*)		(1.1372)	(1.1965)
Firm Age		−0.0024	−0.0024
(*AGE*)		(0.0052)	(0.0047)
Advertising Expenditure		0.0001	0.0002
(*AD*)		(0.0004)	(0.0003)
Advertising Dummy		0.2534	0.0769
(*AD_DUM*)		(0.2686)	(0.3011)
Search Volume Index			0.0664
(*SVI*)			(0.0617)
Observations	161	147	119
Likelihood Ratio Test	p = 0.003	p = 0.001	p = 0.000
Pseudo R-Squared	0.235	0.315	0.403

Note: Robust estimates of standard errors are reported in parentheses. Significance levels are one-tailed for directional predictions and two-tailed otherwise. *p < 0.10; **p < 0.05; ***p < 0.01. The pseudo R^2 refers to Nagelkerke's (1991) R^2.

Appendix F

Economic Significance of WikiMOD

We conduct an additional analysis to evaluate the economic significance of WikiMOD. The analysis is based on column (2) of Table 4. We estimate separate regressions by conditioning WikiMOD at its LOW, MEAN, and HIGH levels, defined as the sample mean minus one standard deviation, the sample mean, and the sample mean plus one standard deviation, respectively. For instance, when we subtract the LOW level from WikiMOD, the estimated coefficient on BIAS represents its effect expected at the LOW level of WikiMOD (Aiken and West 1991). As reported in column (1) of the table below, the coefficient on BIAS is –0.0062. We multiply the coefficient by one standard deviation of BIAS (3.0376), and the result (–1.88%) indicates the market reaction induced by an increasing BIAS (increase by one standard deviation). The market reaction becomes –0.73% in column (2) when WikiMOD is at the MEAN level, and it becomes statistically nonsignificant in column (3) when WikiMOD is at the HIGH level. A comparison of columns (1) and (2) shows that, when WikiMOD moves from the LOW to MEAN level, this increase in information aggregation is associated with a change in market reaction by 1.15% (=(–0.73%) – (–1.88%)). This indicates an economically meaningful impact of information aggregation.

Additional Analysis on Market Reaction			
	WikiMOD = LOW	**WikiMOD = MEAN**	**WikiMOD = HIGH**
	(1)	**(2)**	**(3)**
Coefficient on BIAS	–0.0062***	–0.0024*	0.0014
	(p = 0.0013)	(p = 0.0818)	(p = 0.2886)
Market reaction due to analyst bias (i.e., the abnormal return induced by change of BIAS by one standard deviation)			
	–1.88%	–0.73%	N.S.

Note: The LOW, MEAN, and HIGH levels of WikiMOD are equal to sample mean minus one standard deviation, sample mean, and sample mean plus one standard deviation, respectively. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$; N.S. = nonsignificant.

Appendix G

Robustness to Samples and Measures

Several additional tests show that our results are robust to alternative samples and measures. We present the regression results in the following two tables, one for management disclosure lag and the other for investor reaction.

In each of the two tables, for convenience, column (1) shows our base model as presented in text. In column (2), we sort all observations by the number of analysts' forecasts for EPS, and we keep only observations between the 5th and 95th percentiles. Because *BIAS* and *DISPERSION* are computed based on analyst forecasts, using this subsample helps remove extreme cases.

Columns (3) and (4) examine the extent to which edit wars may affect our result. Since Wikipedia is an open platform and anyone is allowed to post and modify entries, some entries can be very contentious. It is necessary to make sure that our results are not driven by the edit wars. Our first check (reported in Column 3) is based on the "revert" activities. For each modification j by user i, m_{ij}, on Wikipedia, we search for a future (within a month) edit, m_{kj}, by user k that reverts the contribution. Then we search again (within a month from the revert) for i's further revert of k's modification. When we find such patterns we remove the second and third modifications. If we find additional reverts in the same war (i.e., within one month k reverts i's work again), we also remove these additional modifications. The result of this check is a new data set that contains fewer modifications in each quarter with all "back and forth" edits removed. Our second check (reported in Column 4) adopts a more aggressive approach. In this check, we only consider the first contribution by each contributor in each financial period. With this approach, we not only eliminate all future edit wars between this user and others, but also remove additional edits by the same user. The first check yields highly significant effect of WikMOD, and the second also gives significant effect, though relatively weaker (because it is an aggressive approach). Overall, our results regarding information aggregation over Wikipedia remain qualitatively unchanged.

Column (5) uses the number of words added, instead of the number of times an entry is modified, to proxy for information aggregation on Wikipedia. Column (6) measures *NEWS* by the total number of words in all news stories, instead of the total number of news stories, about a firm. Column (7) deflates *BIAS* and *DISPERSION* by stock price (Francis e al. 1997). These two tables demonstrate qualitatively the same results for our hypothesis testing.

	Base model	Number of forecasts: 5th–95th percentile	WikiMOD: removing "reverts"	WikiMOD: keeping the first edit only	WikiMOD: number of words added	NEWS: number of news words	BIAS & DISPERSION: deflated by stock price
Robustness Checks: Wikipedia and Management Disclosure (Regression specification is based on model (1) in text. Variable definitions are in Table 1.)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Wikipedia Modifications	–0.1206*	–0.1316*	–0.1240**	–0.1437*	–0.0869**	–0.0991*	–0.2185**
(*WikiMOD*)	(0.0737)	(0.0848)	(0.0749)	(0.1006)	(0.0534)	(0.0754)	(0.1027)
WikiMOD*DISPERSION	**–0.3473***	**–0.2700**	**–0.3447***	**–0.4143***	**–0.2456***	**–0.3158***	**–52.6100*
	(0.1308)	**(0.1466)**	**(0.1313)**	**(0.1710)**	**(0.0750)**	**(0.0955)**	**(33.1300)**
WikiMOD*BIAS	**0.0990***	**0.0801**	**0.0991***	**0.1244*	**0.0544**	**0.0845***	**16.7800*
	(0.0408)	**(0.0430)**	**(0.0409)**	**(0.0780)**	**(0.0259)**	**(0.0283)**	**(13.0000)**
Analyst Dispersion	–0.0508	0.0115	–0.0464	–0.0694	0.0093	–0.0457	21.3800
(*DISPERSION*)	(0.1890)	(0.2211)	(0.1884)	(0.2204)	(0.1728)	(0.2379)	(51.7400)
Analyst Bias	0.0091	–0.0105	0.0080	0.0017	0.0094	0.0001	2.7360
(*BIAS*)	(0.0460)	(0.0530)	(0.0457)	(0.0534)	(0.0492)	(0.0524)	(15.5500)
Number of News Articles	–0.0947*	–0.0933*	–0.0935*	–0.1033*	–0.0911*	–0.0230	–0.0734
(*NEWS*)	(0.*702)	(0.0697)	(0.0702)	(0.0712)	(0.0667)	(0.0350)	(0.0716)
*NEWS*DISPERSION*	0.2476	0.1728	0.2465	0.1826	0.3519**	0.2105***	47.2500
	(0.1960)	(0.1920)	(0.1960)	(0.1878)	(0.1646)	(0.0836)	(38.6900)
*NEWS*BIAS*	–0.0531	–0.0318	–0.0531	–0.0483	–0.0529	–0.0222	–7.6860
	(0.0469)	(0.0502)	(0.0470)	(0.0585)	(0.0433)	(0.0264)	(6.1500)
Negative Words	–0.0929*	–0.0582	–0.0925*	–0.0944	–0.0994*	–0.0788*	–0.0992*
(*NEGATIVE*)	(0.0650)	(0.0672)	(0.0651)	(0.0818)	(0.0681)	(0.0553)	(0.0618)
*NEGATIVE*DISPERSION*	0.2661*	0.2050	0.2649*	0.2345	0.3971**	0.2647**	252.6000**
	(0.1748)	(0.1891)	(0.1752)	(0.1964)	(0.1889)	(0.1193)	(124.7000)
*NEGATIVE*BIAS*	–0.0519	–0.0130	–0.0520	–0.0503	–0.0706	–0.0208	–35.8200**
	(0.0800)	(0.0840)	(0.0801)	(0.1095)	(0.1008)	(0.0682)	(20.0900)
Positive Words	–0.0571	–0.0693	–0.0569	–0.0665	–0.0697	–0.0709**	–0.0020
(*POSITIVE*)	(0.0545)	(0.0561)	(0.0545)	(0.0592)	(0.0617)	(0.0420)	(0.1735)
*POSITIVE*DISPERSION*	–0.0201	0.1156	–0.0205	0.0350	0.1762	0.0807	–7.9730
	(0.1730)	(0.2101)	(0.1731)	(0.1877)	(0.2278)	(0.1524)	(73.9100)
*POSITIVE*BIAS*	–0.0052	–0.0481	–0.0052	–0.0290	–0.0604	–0.0357	8.8550
	(0.0779)	(0.0891)	(0.0779)	(0.0858)	(0.1034)	(0.0553)	(33.7100)
Earnings Variability	–0.0922***	–0.0938***	–0.0924***	–0.0769**	–0.0993***	–0.1100***	–0.1569***
(*VAR*)	(0.0316)	(0.0316)	(0.0316)	(0.0402)	(0.0357)	(0.0340)	(0.0597)
Market Value	–0.2489***	–0.1432	–0.2494***	–0.2537***	–0.2655***	–0.2803***	–0.2131**
(*MV*)	(0.0913)	(0.1171)	(0.0909)	(0.0939)	(0.0957)	(0.0966)	(0.1071)
High-tech	0.1664	0.2802	0.1674	0.1932	0.1447	0.2148	0.1157
(*HIGHTECH*)	(0.1935)	(0.2177)	(0.1934)	(0.2005)	(0.1962)	(0.1849)	(0.2353)
Regulation	–0.0957	–0.0866	–0.1002	–0.0569	0.0698	–0.1155	–0.3109
(*REG*)	(0.2587)	(0.2132)	(0.2587)	(0.2591)	(0.2912)	(0.3063)	(0.2278)
Quarter 1 Dummy	–0.4338**	–0.4393**	–0.4318**	–0.4346**	–0.4177**	–0.4149**	–0.3727**
(*Q1*)	(0.2211)	(0.2305)	(0.2206)	(0.2216)	(0.2075)	(0.2157)	(0.2220)
Quarter 2 Dummy	–0.1051	–0.1740	–0.1047	–0.0743	–0.1053	–0.0608	–0.3114*
(*Q2*)	(0.2069)	(0.2526)	(0.2069)	(0.2075)	(0.2085)	(0.2103)	(0.2210)
Quarter 3 Dummy	–0.4858**	–0.4705**	–0.4855**	–0.4636**	–0.4221**	–0.4558**	–0.6235***
(*Q3*)	(0.2251)	(0.2405)	(0.2245)	(0.2308)	(0.2275)	(0.2303)	(0.2331)
Observations	161	145	161	161	161	161	161
Likelihood Ratio Test	p = 0.003	p = 0.030	p = 0.003	p = 0.005	p = 0.003	p = 0.001	p = 0.002
Pseudo R-Squared	0.235	0.213	0.236	0.228	0.238	0.251	0.241

Note: Robust estimates of standard errors are reported in parentheses. Significance levels are one-tailed for directional predictions and two-tailed otherwise. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. The pseudo R^2 refers to Nagelkerke's (1991) R^2.

Robustness Checks: Investor Reaction to Disclosure (Regression specification is based on model (2) in text. Variable definitions are in Table 1.)

	Base model	Number of forecasts: 5th–95th percentile	*WikiMOD*: removing "reverts"	*WikiMOD*: keeping the first edit only	*WikiMOD*: number of words added	*NEWS*: number of news words	*BIAS & DISPERSION*: deflated by stock price
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Analyst Bias	−0.0827***	−0.0768***	−0.0829***	−0.0837***	−0.0812***	−0.1021***	−29.7532***
(*BIAS*)	(0.0321)	(0.0320)	(0.0321)	(0.0329)	(0.0338)	(0.0250)	(7.0075)
WikiMOD	−0.0084	−0.0102	−0.0082	−0.0104	−0.0045	−0.0083	−0.0087
	(0.0099)	(0.0102)	(0.0100)	(0.0121)	(0.0062)	(0.0098)	(0.0099)
WikiMOD*BIAS	**0.0035***	**0.0036***	**0.0035***	**0.0042***	**0.0026**	**0.0036***	**0.9843***
	(0.0015)	**(0.0015)**	**(0.0015)**	**(0.0029)**	**(0.0015)**	**(0.0014)**	**(0.2978)**
Market Value	0.0057	0.0092	0.0056	0.0051	0.0062	0.0056	0.0069
(*MV*)	(0.0096)	(0.0094)	(0.0096)	(0.0095)	(0.0103)	(0.0089)	(0.0095)
*MV*BIAS*	0.0046***	0.0043***	0.0046***	0.0046***	0.0046***	0.0065***	1.5831***
	(0.0017)	(0.0017)	(0.0017)	(0.0018)	(0.0018)	(0.0015)	(0.3737)
NEWS	0.0075	0.0073	0.0075	0.0074	0.0059	0.0033	0.0038
	(0.0088)	(0.0088)	(0.0088)	(0.0087)	(0.0084)	(0.0036)	(0.0086)
*NEWS*BIAS*	−0.0039***	−0.0039***	−0.0039***	−0.0038***	−0.0041***	−0.0030***	0.0571
	(0.0013)	(0.0013)	(0.0013)	(0.0016)	(0.0013)	(0.0007)	(0.2644)
NEGATIVE	0.0025	0.0027	0.0026	0.0027	0.0025	0.0028	−0.0019
	(0.0045)	(0.0046)	(0.0045)	(0.0048)	(0.0040)	(0.0046)	(0.0027)
*NEGATIVE*BIAS*	−0.0100***	−0.0099***	−0.0100***	−0.0103**	−0.0096***	−0.0100***	−0.9694***
	(0.0042)	(0.0042)	(0.0042)	(0.0049)	(0.0035)	(0.0034)	(0.2206)
POSITIVE	−0.0016	−0.0015	−0.0015	−0.0015	−0.0017	−0.0009	−0.0034
	(0.0036)	(0.0036)	(0.0036)	(0.0037)	(0.0036)	(0.0039)	(0.0027)
*POSITIVE*BIAS*	0.0000	0.0000	0.0000	−0.0003	−0.0006	−0.0009	1.2430***
	(0.0033)	(0.0033)	(0.0033)	(0.0032)	(0.0030)	(0.0025)	(0.5228)
Observations	161	154	161	161	161	161	161
R–Squared	0.1498	0.1657	0.1494	0.1464	0.1505	0.1613	0.1674

Note: Robust estimates of standard errors are reported in parentheses. Significance levels are one-tailed for directional predictions and two-tailed otherwise. *p < 0.10; **p < 0.05; ***p < 0.01.

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