

Online Appendix for “Negative Peer Disclosure”

Appendix A: Examples of corporate NPDs

This appendix lists ten examples of corporate NPDs in our sample, in chronological order. Column (2) lists the name of the tweeting firm, column (3) lists the name(s) of the tweeted firm(s), column (4) lists the initial news day, column (5) lists the NPD tweeting day, and column (6) includes the hyperlinked tweet. We define a corporate tweet as an NPD if the tweeting firm discloses news of its industry peer(s) without mentioning itself and the disclosure contains more negative words than positive words according to the financial dictionary of Loughran and McDonald (2011).

(1) No.	(2) Tweeting firm	(3) Tweeted firm	(4) News day	(5) NPD day	(6) NPD tweet
1	Nvidia Corp	Intel Corp	Nov. 4, 2009	Nov. 4, 2009	NY attorney general files antitrust lawsuit against Intel http://bit.ly/1gP5aG.. accompanying cartoon at http://bit.ly/10d7qP
2	Juniper Networks, Inc.	Microsoft Corp and Google Inc.	Sep. 11, 2011	Sep. 12, 2011	.@Microsoft and @Google Suffer Outages: Can You Trust the #Cloud? http://bit.ly/oG0NyE cc: @PCworld @TheTonyBradley
3	Support.com, Inc.	Symantec Corp	Jan. 17, 2012	Jan. 18, 2012	Symantec says source code stolen in 2006 hack http://cot.ag/A0ZxoP
4	Nvidia Corp	Intel Corp	Jul. 10, 2013	Jul. 11, 2013	Intel vs. ARM benchmark seen as flawed – essential benchmark code found missing. http://bit.ly/1b2U8gq
5	Globalscape, Inc.	Dropbox, Inc. and Box, Inc.	May 8, 2014	May 19, 2014	New Dropbox and Box vulnerabilities discovered: http://tek.io/1t9SMXW
6	Symantec Corp	Cisco Systems, Inc.	Jul. 16, 2014	Jul. 17, 2014	Multiple Cisco Wireless Gateways Vulnerable to Remote Attacks http://bit.ly/1mXTp56
7	Boingo Wireless, Inc.	Comcast Corp	Apr. 23, 2015	Apr. 23, 2015	It was announced that #Comcast Said to Plan Dropping #TWC Deal: Here’s Why http://bloom.bg/1PpTo6V via @business #merger
8	T-Mobile US, Inc.	AT&T Corp	May 3, 2016	May 4, 2016	Calling all #Uncarrier Rebels! It’s time to expose the dark side of @ATT. #DeATThStar http://t-mo.co/23nLTCC
9	Towerstream Corp	Verizon Communications Inc.	Mar. 7, 2016	Mar. 9, 2016	FCC Hits Verizon Hard With \$1.4 Million Fine - http://time.com/money/4250000/verizon-supercookies-fcc-settlement/
10	Rapid 7, Inc.	Oracle Corp	Nov. 20, 2017	Nov. 20, 2017	The Oracle #JoltandBleed vulnerabilities: what you need to know http://r-7.co/2zmaV1o

Table OA1. Time of tweeting relative to market open and close

Time of tweeting (Eastern Time)	Number of NPDs	Percentage of NPDs (%)
12:00 AM to 3:59 AM	15	2.31
4:00 AM to 7:59 AM	10	1.54
8:00 AM to 9:29 AM	28	4.31
9:30 AM to 4:00 PM	323	49.78
4:01 PM to 6:30 PM	132	20.34
6:31 PM to 8:00 PM	39	6.01
8:01 PM to 11:59 PM	50	7.70
Non-trading days	52	8.01
Total	649	100.00

This table reports sample distribution of the tweeting time relative to market open and close. We divide a trading day into seven intervals, namely 12:00-3:59am before market open, 4:00-7:59am interval of less frequent before-hour trading, 8-9:29am interval of frequent before-hour trading, 9:30am-4:00pm regular trading hours, 4:01-6:30pm interval of frequent after-hour trading, 6:31-8:00pm interval of less frequent after-hour trading, and 8:01-11:59pm after market close. All are based on Eastern Time. Non-trading days include weekends and holidays.

Table OA2. Characteristic-adjusted event returns to tweeting firms: bivariate sorts**Panel A: Book-to-market/profitability-adjusted CARs to tweeting firms surrounding NPDs**

Event window	Including same-day NPDs		Excluding same-day NPDs	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.009 ^{***}	0.008 ^{***}	0.010 ^{***}	0.009 ^{***}
[0, +1]	0.016 ^{***}	0.015 ^{***}	0.017 ^{***}	0.016 ^{***}
[-2, -1]	-0.001	-0.002	-0.002	-0.003
No. of obs.	558	558	386	386

Panel B: Book-to-market/investment-adjusted CARs to tweeting firms surrounding NPDs

Event window	Including same-day NPDs		Excluding same-day NPDs	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.009 ^{***}	0.009 ^{***}	0.009 ^{***}	0.009 ^{***}
[0, +1]	0.016 ^{***}	0.016 ^{***}	0.017 ^{***}	0.017 ^{***}
[-2, -1]	-0.003	-0.001	-0.002	-0.002
No. of obs.	558	558	386	386

Panel C: Profitability/investment-adjusted CARs to tweeting firms surrounding NPDs

Event window	Including same-day NPDs		Excluding same-day NPDs	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.009 ^{***}	0.008 ^{***}	0.010 ^{***}	0.009 ^{***}
[0, +1]	0.017 ^{***}	0.015 ^{***}	0.017 ^{***}	0.016 ^{***}
[-2, -1]	-0.001	-0.002	-0.001	-0.002
No. of obs.	558	558	386	386

Panel D: Book-to-market/profitability-adjusted CARs to tweeting firms surrounding initial news days

Event window	Including same-day NPDs		Excluding same-day NPDs	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.003 ^{**}	0.003 ^{***}	-0.001	-0.001
[0, +1]	0.008 ^{***}	0.008 ^{***}	0.002	0.002
[-2, -1]	0.001	0.001	0.000	0.000
No. of obs.	384	384	212	212

Panel E: Book-to-market/investment-adjusted CARs to tweeting firms surrounding initial news days

Event window	Including same-day NPDs		Excluding same-day NPDs	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.003 ^{***}	0.003 ^{**}	-0.001	-0.001
[0, +1]	0.008 ^{***}	0.007 ^{***}	0.002	0.001
[-2, -1]	0.001	-0.000	0.000	-0.001
No. of obs.	384	384	212	212

Panel F: Profitability/investment-adjusted CARs to tweeting firms surrounding initial news days

Event window	Including same-day NPDs		Excluding same-day NPDs	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.003 ^{***}	0.003 ^{**}	-0.001	-0.002
[0, +1]	0.008 ^{***}	0.007 ^{***}	0.002	0.001
[-2, -1]	0.001	0.000	0.000	-0.001
No. of obs.	384	384	212	212

Panels A-C report the mean book-to-market/profitability-adjusted, book-to-market/investment-adjusted, and profitability/investment-adjusted cumulative abnormal returns (CARs) to tweeting firms surrounding NPDs, respectively. Panels D-F report the corresponding CARs to tweeting firms surrounding initial news days, respectively. The first two columns of each panel report CARs including same-day NPDs (i.e., NPDs retweeted on initial news days), and the last two columns of each panel report CARs excluding same-day NPDs. Each column tests whether the characteristic-adjusted CAR is significantly different from zero. Detailed variable definitions are in Appendix A of the main text. Samples include individual NPDs and initial news events for which characteristic-adjusted CARs are available for tweeting firms as indicated in each panel. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA3. Characteristic-adjusted event returns to tweeted firms: bivariate sorts

Panel A: Book-to-market/profitability-adjusted CARs to tweeted firms

Event window	Surrounding initial news days		Surrounding NPDs	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	-0.002**	-0.002**	0.001	0.001
[0, +1]	-0.002**	-0.003**	0.002*	0.001
[-2, -1]	0.001	0.001	0.001	0.000
No. of obs.	360	360	521	521

Panel B: Book-to-market/investment-adjusted CARs to tweeted firms

Event window	Surrounding initial news days		Surrounding NPDs	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	-0.002**	-0.002**	0.001*	0.001
[0, +1]	-0.002**	-0.003***	0.002	0.001
[-2, -1]	0.002	0.001	0.001	0.001
No. of obs.	360	360	521	521

Panel C: Profitability/investment-adjusted CARs to tweeted firms

Event window	Surrounding initial news days		Surrounding NPDs	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	-0.002**	-0.002**	0.001*	0.001
[0, +1]	-0.002**	-0.003**	0.001	0.001
[-2, -1]	0.002	0.001	0.001	0.001
No. of obs.	360	360	521	521

Panels A-C report the mean book-to-market/profitability-adjusted, book-to-market/investment-adjusted, and profitability/investment-adjusted CARs to tweeted firms. The first two columns of each panel report CARs surrounding initial news days, and the last two columns of each panel report CARs surrounding NPDs. Each column tests whether the characteristic-adjusted CAR is significantly different from zero. Detailed variable definitions are in Appendix A of the main text. Samples include individual NPDs and initial news events for which characteristic-adjusted CARs are available for tweeted firms as indicated in each panel. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA4. Event returns to tweeting firms surrounding NPDs and spillover strength

Panel A: Including same-day NPDs

Event window	CARs over the value-weighted market portfolio		CARs over the value-weighted industry portfolio	
	<i>Low Prod proximity</i>	<i>High Prod proximity</i>	<i>Low Prod proximity</i>	<i>High Prod proximity</i>
[0, 0]	0.007***	0.009***	0.007***	0.009***
[0, +1]	0.012***	0.018***	0.013***	0.018***
No. of obs.	296	295	296	295
Event window	CARs over the value-weighted market portfolio		CARs over the value-weighted industry portfolio	
	<i>Low Prod similarity</i>	<i>High Prod similarity</i>	<i>Low Prod similarity</i>	<i>High Prod similarity</i>
[0, 0]	0.008***	0.009***	0.008***	0.009***
[0, +1]	0.014***	0.019***	0.014***	0.019***
No. of obs.	256	255	256	255
Event window	CARs over the value-weighted market portfolio		CARs over the value-weighted industry portfolio	
	<i>Low Tech proximity</i>	<i>High Tech proximity</i>	<i>Low Tech proximity</i>	<i>High Tech proximity</i>
[0, 0]	0.006**	0.013***	0.005**	0.012***
[0, +1]	0.005*	0.017***	0.005*	0.018***
No. of obs.	90	89	90	89

Panel B: Excluding same-day NPDs

Event window	CARs over the value-weighted market portfolio		CARs over the value-weighted industry portfolio	
	<i>Low Prod proximity</i>	<i>High Prod proximity</i>	<i>Low Prod proximity</i>	<i>High Prod proximity</i>
[0, 0]	0.006***	0.011***	0.006***	0.010***
[0, +1]	0.013***	0.019***	0.013**	0.019***
No. of obs.	204	203	204	203
Event window	CARs over the value-weighted market portfolio		CARs over the value-weighted industry portfolio	
	<i>Low Prod similarity</i>	<i>High Prod similarity</i>	<i>Low Prod similarity</i>	<i>High Prod similarity</i>
[0, 0]	0.007***	0.010***	0.007***	0.010***
[0, +1]	0.014***	0.017***	0.014***	0.017***
No. of obs.	178	178	178	178
Event window	CARs over the value-weighted market portfolio		CARs over the value-weighted industry portfolio	
	<i>Low Tech proximity</i>	<i>High Tech proximity</i>	<i>Low Tech proximity</i>	<i>High Tech proximity</i>
[0, 0]	0.007**	0.012***	0.007**	0.011***
[0, +1]	0.007*	0.015***	0.006*	0.015***
No. of obs.	62	62	62	62

This table reports the mean CARs relative to value-weighted market and industry portfolios to tweeting firms surrounding NPDs, splitting the sample based on the level of *Prod proximity*, *Prod similarity*, and *Tech proximity*, respectively. Panel A includes same-day NPDs and Panel B excludes them. Each column tests whether the market- or industry-adjusted CAR is significantly different from zero. Numbers in bold indicate that returns are significantly different between two subsamples. Detailed variable definitions are in Appendix A of the main text. Samples include individual NPD events for which market- and industry-adjusted CARs are available for tweeting firms and measures of spillover strength can be calculated for the NPD year as indicated in each panel. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA5. Event returns to tweeting firms surrounding NPDs and spillover clarity

Panel A: Including same-day NPDs

Event window	CARs over the value-weighted market portfolio		CARs over the value-weighted industry portfolio	
	Low <i>SIC3Brdth</i>	High <i>SIC3Brdth</i>	Low <i>SIC3Brdth</i>	High <i>SIC3Brdth</i>
[0, 0]	0.006 ***	0.011 ***	0.006 ***	0.011 ***
[0, +1]	0.010 ***	0.021 ***	0.011 ***	0.021 ***
No. of obs.	300	299	300	299
Event window	<i>DiffSIC3=0</i>	<i>DiffSIC3=1</i>	<i>DiffSIC3=0</i>	<i>DiffSIC3=1</i>
[0, 0]	0.007 ***	0.011 ***	0.007 ***	0.011 ***
[0, +1]	0.015***	0.017***	0.015***	0.017***
No. of obs.	391	208	391	208

Panel B: Excluding same-day NPDs

Event window	CARs over the value-weighted market portfolio		CARs over the value-weighted industry portfolio	
	Low <i>SIC3Brdth</i>	High <i>SIC3Brdth</i>	Low <i>SIC3Brdth</i>	High <i>SIC3Brdth</i>
[0, 0]	0.006 ***	0.011 ***	0.006 ***	0.011 ***
[0, +1]	0.011 ***	0.022 ***	0.011 ***	0.021 ***
No. of obs.	206	205	206	205
Event window	<i>DiffSIC3=0</i>	<i>DiffSIC3=1</i>	<i>DiffSIC3=0</i>	<i>DiffSIC3=1</i>
[0, 0]	0.007 ***	0.011 ***	0.007 ***	0.011 ***
[0, +1]	0.015***	0.017***	0.015***	0.017***
No. of obs.	253	158	253	158

This table reports the mean CARs relative to value-weighted market and industry portfolios to tweeting firms surrounding NPDs, splitting the sample based on the level of *SIC3Brdth* and *DiffSIC3*, respectively. Panel A includes same-day NPDs and Panel B excludes them. Each column tests whether the market- or industry-adjusted CAR is significantly different from zero. Numbers in bold indicate that returns are significantly different between two subsamples. Detailed variable definitions are in Appendix A of the main text. Samples include individual NPD events for which market- and industry-adjusted CARs are available for tweeting firms and measures of spillover clarity can be calculated for the NPD year as indicated in each panel. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA6. Event returns to tweeting firms: alternative definition of tone**Panel A: Market- and industry-adjusted CARs to tweeting firms surrounding NPDs**

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.007***	0.007***	0.007***	0.007***
[0, +1]	0.011***	0.011***	0.012***	0.012***
[-2, -1]	-0.000	0.000	-0.000	-0.000
No. of obs.	624	624	624	624

Panel B: Market- and industry-adjusted CARs to tweeting firms surrounding NPDs excluding same-day NPDs

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.007***	0.007**	0.007***	0.006***
[0, +1]	0.011***	0.011***	0.012***	0.011***
[-2, -1]	0.001**	0.000	0.001	-0.000
No. of obs.	464	464	464	464

Panel C: Market- and industry-adjusted CARs to tweeting firms surrounding initial news days

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.005***	0.005***	0.005***	0.005***
[0, +1]	0.008***	0.008***	0.009***	0.009***
[-2, -1]	-0.001	-0.000	0.001	-0.000
No. of obs.	394	394	394	394

Panel D: Market- and industry-adjusted CARs to tweeting firms surrounding initial news days excluding same-day NPDs

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.002*	0.002	0.003**	0.002
[0, +1]	0.007***	0.007***	0.007***	0.002***
[-2, -1]	-0.001	-0.001	0.000	-0.001
No. of obs.	232	232	232	232

Panel A reports the mean market- or industry-adjusted CARs to tweeting firms surrounding NPDs. Panel B reports the corresponding CARs to tweeting firms surrounding NPDs excluding same-day NPDs. Panel C reports the corresponding CARs to tweeting firms surrounding initial news days. Panel D reports the corresponding CARs to tweeting firms surrounding initial news days excluding same-day NPDs. The first two columns of each panel report market-adjusted CARs, and the last two columns of each panel report industry-adjusted CARs. Each column tests whether the market- or industry-adjusted CAR is significantly different from zero. Detailed variable definitions are in Appendix A of the main text. Samples include individual NPD and initial news events for which market- and industry-adjusted CARs are available for tweeting firms as indicated in each panel. In building the sample of NPDs, we define the tone of a tweet negative if the news summary contains more negative words than positive words according to at least two of the four commonly used word lists: Loughran and McDonald's (2011) dictionary, Harvard General Inquirer's IV-4 dictionary, Hu and Liu's (2004) QDAP dictionary, and Henry's (2008) financial dictionary. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA7. Event returns to tweeted firms: alternative definition of tone

Panel A: Market- and industry-adjusted CARs to tweeted firms surrounding initial news days

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	-0.003**	-0.003**	-0.003**	-0.003**
[0, +1]	-0.003**	-0.004**	-0.001*	-0.003**
[-2, -1]	0.000	-0.000	0.002**	0.000
No. of obs.	375	375	375	375

Panel B: Market- and industry-adjusted CARs to tweeted firms surrounding NPDs

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	-0.000	-0.000	-0.000	-0.000
[0, +1]	-0.001	-0.000	0.000	-0.001
[-2, -1]	-0.001	-0.001	-0.000	0.002
No. of obs.	595	595	595	595

Panel A reports the mean market- or industry-adjusted CARs to tweeted firms surrounding initial news days. Panel B reports the corresponding CARs to tweeted firms surrounding NPDs. The first two columns of each panel report market-adjusted CARs, and the last two columns of each panel report industry-adjusted CARs. Each column tests whether the market- or industry-adjusted CAR is significantly different from zero. Detailed variable definitions are in Appendix A of the main text. Samples include individual NPD and initial news events for which market- and industry-adjusted CARs are available for tweeted firms as indicated in each panel. In building the sample of NPDs, we define the tone of a tweet negative if the news summary contains more negative words than positive words according to at least two of the four commonly used word lists: Loughran and McDonald's (2011) dictionary, Harvard General Inquirer's IV-4 dictionary, Hu and Liu's (2004) QDAP dictionary, and Henry's (2008) financial dictionary. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA8. NPD and spillovers: alternative definition of tone

Dependent variable	(1)	(2)	(3)	(4)	(5)
	<i>NPD_t</i>				
<i>Prod proximity</i>	0.257*** (0.099)			0.102 (0.131)	0.312** (0.1137)
<i>Prod similarity</i>		7.562*** (1.321)		9.124*** (1.512)	8.747*** (1.262)
<i>Tech proximity</i>			0.753*** (0.273)	0.080 (0.224)	-0.014 (0.195)
<i>SIC3Brdth</i>				0.135* (0.072)	
<i>DiffSIC3</i>					0.247* (0.149)
Basic Controls	Yes	Yes	Yes	Yes	Yes
Firm and Year fixed effects	Yes	Yes	Yes	No	No
Industry and Year fixed effects	No	No	No	Yes	Yes
No. of obs.	3,849	3,849	1,486	1,309	1,309
Pseudo R ²	0.223	0.243	0.196	0.189	0.186

This table reports the probit regression results on the relation between the propensity to issue NPDs and spillover strength or spillover clarity. In building the sample of NPDs, we define the tone of a tweet negative if the news summary contains more negative words than positive words according to at least two of the four commonly used word lists: Loughran and McDonald's (2011) dictionary, Harvard General Inquirer's IV-4 dictionary, Hu and Liu's (2004) QDAP dictionary, and Henry's (2008) financial dictionary. All five columns use the conditional samples for which firm *j* receives at least one NPD during the year. Sample size is limited by data availability of *Tech proximity* in column (3) and further limited by data availability of *SIC3Brdth* and *DiffSIC3* in columns (4)-(5). The focal firm of each pair is labeled *i* and the other firm *j*. *NPD* denotes the issuance of NPDs. Spillover strength is measured using *Prod proximity* in column (1), *Prod similarity* in column (2), *Tech proximity* in column (3), and all three in columns (4) and (5). Spillover clarity is measured using *SIC3Brdth* in column (4) and *DiffSIC3* in column (5). Controls include *Relative size*, *Relative MB*, *Relative ROA*, *Relative lev* as well as fixed effects as indicated in each column. Detailed variable definitions are in Appendix A of the main text. Standard errors, displayed in parentheses below coefficient estimates, are adjusted for heteroskedasticity and are clustered by focal firm and year. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA9. NPD and spillovers: additional controls

Dependent variable	(1)	(2)	(3)	(4)	(5)
	<i>NPD_t</i>				
<i>Prod proximity</i>	0.327*** (0.088)			0.230 (0.159)	0.424** (0.187)
<i>Prod similarity</i>		5.710*** (1.272)		4.055** (1.706)	3.304* (1.713)
<i>Tech proximity</i>			0.931** (0.282)	0.382 (0.305)	0.321 (0.269)
<i>SIC3Brdth</i>				0.143*** (0.046)	
<i>DiffSIC3</i>					0.183* (0.099)
<i>Size</i>	0.014 (0.143)	-0.016 (0.138)	0.459** (0.183)	0.377 (0.240)	0.358 (0.243)
<i>Lev</i>	0.473 (0.875)	-0.044 (0.780)	0.918 (0.715)	-0.398 (0.876)	-0.599 (0.949)
<i>RetVol</i>	10.411 (9.710)	9.932 (9.617)	-3.879 (17.074)	-4.684 (17.725)	-4.718 (17.313)
<i>Analyst</i>	0.223* (0.128)	0.241* (0.131)	-0.122 (0.190)		
<i>InstHolding</i>	-0.297* (0.172)	-0.309* (0.164)	0.524 (0.504)	0.385 (0.603)	0.402 (0.596)
<i>MB</i>	-0.023 (0.021)	-0.026 (0.020)	-0.010 (0.033)	0.007 (0.020)	-0.002 (0.017)
<i>EarnVol</i>	-1.790 (1.211)	-1.894 (1.234)	-2.347* (1.204)	-2.323* (1.314)	-2.236* (1.339)
<i>ChEarn</i>	-0.159 (0.107)	-0.156 (0.105)	-0.141* (0.078)	-0.092 (0.095)	-0.075 (0.093)
Basic Controls	Yes	Yes	Yes	Yes	Yes
Firm and Year fixed effects	Yes	Yes	Yes	No	No
Industry and Year fixed effects	No	No	No	Yes	Yes
No. of obs.	3,613	3,613	1,813	1,512	1,512
Pseudo R ²	0.227	0.235	0.112	0.189	0.185

This table reports the probit regression results on the relation between the propensity to issue NPDs and spillover strength or spillover clarity. All five columns use the conditional samples for which firm *j* receives at least one NPD during the year. Sample size is limited by data availability of *Tech proximity* in column (3) and further limited by data availability of *SIC3Brdth* and *DiffSIC3* in columns (4)-(5). The focal firm of each pair is labeled *i* and the other firm *j*. *NPD* denotes the issuance of NPDs. Spillover strength is measured using *Prod proximity* in column (1), *Prod similarity* in column (2), *Tech proximity* in column (3), and all three in columns (4) and (5). Spillover clarity is measured using *SIC3Brdth* in column (4) and *DiffSIC3* in column (5). Controls include basic controls (*Relative size*, *Relative MB*, *Relative ROA*, *Relative lev*), controls for the focal firm (*Size*, *MB*, *Lev*, *RetVol*, *Analyst*, *InstHolding*, *EarnVol*, and *ChEarn*) as well as fixed effects as indicated in each column. Detailed variable definitions are in Appendix A of the main text and Table OA16. Standard errors, displayed in parentheses below coefficient estimates, are adjusted for heteroskedasticity and are clustered by focal firm and year. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA10. NPD and technology spillover: alternative definition of tech proximity

Dependent variable	(1)	<i>NPD_t</i>	(2)
<i>Tech proximity_18y</i>	0.994 ^{***} (0.280)		
<i>Tech proximity_15y</i>			1.338 ^{***} (0.283)
<i>Relative size</i>	0.665 (0.887)		0.581 (0.874)
<i>Relative MB</i>	0.004 (0.006)		0.003 (0.006)
<i>Relative ROA</i>	0.448 (0.897)		0.491 (0.868)
<i>Relative lev</i>	-1.467 ^{***} (0.555)		-1.528 ^{***} (0.550)
<i>Intercept</i>	-2.464 ^{***} (0.942)		-2.371 ^{***} (0.908)
Firm and Year fixed effects	Yes		Yes
No. of obs.	1,815		1,815
Pseudo R ²	0.217		0.219

This table reports the probit regression results on the relation between the propensity to issue NPDs and technology spillover. Both columns use the conditional sample for which firm *j* receives at least one NPD during the year. Sample size is limited by data availability of *Tech proximity_18y* and *Tech proximity_15y*. The focal firm of each pair is labeled *i* and the other firm *j*. *NPD* denotes the issuance of NPDs. Technology spillover is measured using *Tech proximity_18y* in column (1) and *Tech proximity_15y* in column (2). Controls include *Relative size*, *Relative MB*, *Relative ROA*, *Relative lev* as well as focal firm, year, and peer firm fixed effects. Detailed variable definitions are in Appendix A of the main text and Table OA16. Standard errors, displayed in parentheses below coefficient estimates, are adjusted for heteroskedasticity and are clustered by focal firm and year. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA11. NPD and spillovers: alternative conditional sample

Dependent variable	(1)	(2)	(3)	(4)	(5)
	<i>NPD_t</i>				
<i>Prod proximity</i>	0.296 ^{***} (0.064)			0.254 ^{***} (0.095)	0.321 ^{***} (0.119)
<i>Prod similarity</i>		4.335 ^{***} (0.541)		3.810 ^{***} (0.874)	4.223 ^{***} (0.864)
<i>Tech proximity</i>			0.554 ^{***} (0.169)	0.320 [*] (0.167)	0.306 [*] (0.169)
<i>SIC3Brdth</i>				0.056 ^{**} (0.027)	
<i>DiffSIC3</i>					0.158 ^{**} (0.065)
Basic Controls	Yes	Yes	Yes	Yes	Yes
Firm and Year fixed effects	Yes	Yes	Yes	No	No
Industry and Year fixed effects	No	No	No	Yes	Yes
No. of obs.	35,185	35,185	17,519	13,806	13,806
Pseudo R ²	0.275	0.281	0.290	0.302	0.306

This table reports the probit regression results on the relation between the propensity to issue NPDs and spillover strength or spillover clarity. All five columns use the conditional samples for which there is at least one piece of negative product-related news in firm *i*'s TNIC-3 industry group of year *t*. Sample size is limited by data availability of *Tech proximity* in column (3) and further limited by data availability of *SIC3Brdth* and *DiffSIC3* in columns (4)-(5). The focal firm of each pair is labeled *i* and the other firm *j*. *NPD* denotes the issuance of NPDs. Spillover strength is measured using *Prod proximity* in column (1), *Prod similarity* in column (2), *Tech proximity* in column (3), and all three in columns (4) and (5). Spillover clarity is measured using *SIC3Brdth* in column (4) and *DiffSIC3* in column (5). Controls include *Relative size*, *Relative MB*, *Relative ROA*, *Relative lev* as well as fixed effects as indicated in each column. Detailed variable definitions are in Appendix A of the main text. Standard errors, displayed in parentheses below coefficient estimates, are adjusted for heteroskedasticity and are clustered by focal firm and year. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA12. Event returns to tweeting firms: a larger sample

Panel A: Market- and industry-adjusted CARs to tweeting firms surrounding NPDs

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0,0]	0.006 ^{***}	0.006 ^{***}	0.007 ^{**}	0.006 ^{***}
[0,+1]	0.010 ^{***}	0.010 ^{***}	0.011 ^{***}	0.010 ^{***}
[-2,-1]	-0.002 ^{**}	-0.001	-0.001	-0.000
No. of obs.	998	998	998	998

Panel B: Market- and industry-adjusted CARs to tweeting firms surrounding NPDs excluding same-day NPDs

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.006 ^{**}	0.006 ^{***}	0.007 ^{***}	0.005 ^{***}
[0, +1]	0.011 ^{***}	0.010 ^{***}	0.012 ^{***}	0.010 ^{***}
[-2, -1]	-0.000	-0.001	0.000	-0.001
No. of obs.	644	644	644	644

Panel C: Market- and industry-adjusted CARs to tweeting firms surrounding initial news days

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.003 ^{**}	0.003 ^{**}	0.003 ^{**}	0.003 ^{**}
[0, +1]	0.006 ^{**}	0.005 ^{**}	0.007 ^{**}	0.006 ^{**}
[-2, -1]	-0.001	-0.002	0.000	-0.002
No. of obs.	816	816	816	816

Panel D: Market- and industry-adjusted CARs to tweeting firms surrounding initial news days excluding same-day NPDs

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	0.000	-0.003	0.001	-0.003
[0, +1]	0.000	0.002	0.000	0.002
[-2, -1]	-0.001	-0.001	0.000	-0.001
No. of obs.	465	465	465	465

Panel A reports the mean market- or industry-adjusted CARs to tweeting firms surrounding NPDs. Panel B reports the corresponding CARs to tweeting firms surrounding NPDs excluding same-day NPDs. Panel C reports the corresponding CARs to tweeting firms surrounding initial news days. Panel D reports the corresponding CARs to tweeting firms surrounding initial news days excluding same-day NPDs. The first two columns of each panel report market-adjusted CARs, and the last two columns of each panel report industry-adjusted CARs. Each column tests whether the market- or industry-adjusted CAR is significantly different from zero. Samples include individual NPDs and initial news events for which market- and industry-adjusted CARs are available for tweeting firms as indicated in each panel. Detailed variable definitions are in Appendix A of the main text. In building the sample of NPDs, we supplement the primary sample with 639 neutral peer disclosures where the initial news triggered sizable negative market reactions for the tweeted firms. ^{***}

(**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA13. Event returns to tweeted firms: a larger sample

Panel A: Market- and industry-adjusted CARs to tweeted firms surrounding initial news days

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	-0.005 ^{***}	-0.005 ^{**}	-0.005 ^{**}	-0.006 ^{***}
[0, +1]	-0.010 ^{**}	-0.010 ^{**}	-0.009 ^{***}	-0.011 ^{***}
[-2, -1]	-0.000	0.000	0.001	-0.000
No. of obs.	811	811	811	811

Panel B: Market- and industry-adjusted CARs to tweeted firms surrounding NPDs

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	-0.002 ^{***}	-0.002 ^{***}	-0.002 ^{***}	-0.003 ^{***}
[0, +1]	-0.004 ^{***}	-0.004 ^{***}	-0.003 ^{***}	-0.004 ^{***}
[-2, -1]	-0.003 ^{***}	-0.002 ^{***}	-0.001 [*]	0.000
No. of obs.	972	972	972	972

Panel A reports the mean market- or industry-adjusted CARs to tweeted firms surrounding initial news days. Panel B reports the corresponding CARs to tweeted firms surrounding NPDs. The first two columns of each panel report market-adjusted CARs, and the last two columns of each panel report industry-adjusted CARs. Each column tests whether the market- or industry-adjusted CAR is significantly different from zero. Samples include individual NPDs and initial news events for which market- and industry-adjusted CARs are available for tweeted firms as indicated in each panel. Detailed variable definitions are in Appendix A of the main text. In building the sample of NPDs, we supplement the primary sample with 639 neutral peer disclosures where the initial news triggered sizable negative market reactions for the tweeted firms. ^{***} (^{**}) (^{*}) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

Table OA14. NPD and spillovers: a larger sample

Dependent variable	(1)	(2)	(3)	(4)	(5)
			<i>NPD_t</i>		
<i>Prod proximity</i>	0.127 (0.083)			-0.049 (0.110)	0.059 (0.152)
<i>Prod similarity</i>		4.713*** (0.582)		4.246*** (1.192)	3.288*** (0.882)
<i>Tech proximity</i>			0.606** (0.264)	0.102 (0.169)	0.095 (0.134)
<i>SIC3Brdth</i>				0.163*** (0.031)	
<i>DiffSIC3</i>					0.209* (0.127)
Basic Controls	Yes	Yes	Yes	Yes	Yes
Firm and Year fixed effects	Yes	Yes	Yes	No	No
Industry and Year fixed effects	No	No	No	Yes	Yes
No. of obs.	6,813	6,813	3,421	2,894	2,894
Pseudo R ²	0.205	0.215	0.218	0.150	0.122

This table reports the probit regression results on the relation between the propensity to issue NPDs and spillover strength or spillover clarity. All five columns use the conditional samples for which firm *j* receives at least one NPD during the year. In building the sample of NPDs, we supplement the primary sample with 639 neutral peer disclosures where the initial news triggered sizable negative market reactions for the tweeted firms. Sample size is limited by data availability of *Tech proximity* in column (3) and further limited by data availability of *SIC3Brdth* and *DiffSIC3* in columns (4)-(5). The focal firm of each pair is labeled *i* and the other firm *j*. *NPD* denotes the issuance of NPDs. Spillover strength is measured using *Prod proximity* in column (1), *Prod similarity* in column (2), *Tech proximity* in column (3), and all three in columns (4) and (5). Spillover clarity is measured using *SIC3Brdth* in column (4) and *DiffSIC3* in column (5). Controls include *Relative size*, *Relative MB*, *Relative ROA*, *Relative lev* as well as fixed effects as indicated in each column. Detailed variable definitions are in Appendix A of the main text. Standard errors, displayed in parentheses below coefficient estimates, are adjusted for heteroskedasticity and are clustered by focal firm and year. *** (**) (*) indicates significance at the 1% (5%) (10%) level using the two-tailed tests.

**Table OA15. Performance of NPD tweeting firms versus non-NPD-tweeting firms:
a larger sample**

Panel A: Estimated propensity score distribution

Propensity scores	No. of obs.	SD	Min	P25	Median	Mean	P75	Max
Tweeting firms	366	0.017	0.883	0.959	0.970	0.967	0.979	0.998
Control firms	366	0.017	0.853	0.958	0.969	0.967	0.978	0.997
Difference	366	0.000	0.030	0.001	0.001	0.000	0.001	0.001

Panel B: Differences in preevent basic characteristics

	Tweeting firms	Control firms	Differences	<i>p</i> -value
<i>Size</i>	7.095	6.801	0.294	0.588
<i>MB</i>	4.044	4.239	-0.195	0.667
<i>ROA</i>	-0.032	-0.044	0.012	0.448
<i>CFOA</i>	0.075	0.067	0.008	0.474
<i>Lev</i>	0.133	0.123	0.009	0.458

Panel C: Univariate DiD test of product market outcomes and operating performance

	N	Tweeting firms	Control firms	DiD estimator	<i>p</i> -value
$\Delta AdjSale_{t+1} - \Delta AdjSale_{t-1}$	366	0.013	-0.068	0.193	0.021
$\Delta MktShr_{t+1} - \Delta MktShr_{t-1}$	366	0.016	0.003	0.013	0.106
$\Delta Cntrct_{t+1} - \Delta Cntrct_{t-1}$	366	0.164	-0.329	0.493	0.083
$ROA_{t+1} - ROA_{t-1}$	366	0.012	-0.010	0.022	0.019
$CFOA_{t+1} - CFOA_{t-1}$	366	0.007	-0.006	0.013	0.048

Panel D: Multivariate DiD test of product market outcomes and operating performance

Dependent variable	(1) $\Delta AdjSale_t$	(2) $\Delta MktShr_t$	(3) $\Delta Cntrct_t$	(4) ROA_t	(5) $CFOA_t$
<i>NPD</i> × <i>POST</i>	0.150** (0.067)	0.005* (0.003)	0.143* (0.081)	0.028** (0.012)	0.015* (0.009)
<i>POST</i>	-0.097* (0.052)	-0.001 (0.004)	-0.453* (0.264)	-0.008 (0.009)	0.001 (0.001)
Controls	Yes	Yes	Yes	Yes	Yes
Firm and Year fixed effects	Yes	Yes	Yes	Yes	Yes
No. of obs.	2,714	2,714	2,714	2,714	2,714
R ²	0.280	0.121	0.430	0.740	0.723

Panel E: Market- and industry-adjusted CARs to matched non-NPD-tweeting firms surrounding NPDs of tweeting firms

Event window	CARs over the market portfolio		CARs over the industry portfolio	
	Equal-weighted	Value-weighted	Equal-weighted	Value-weighted
[0, 0]	-0.002**	-0.002**	-0.003***	-0.002***
[0, +1]	-0.003**	-0.003**	-0.003**	-0.003**
No. of obs.	579	579	579	579

This table examines the performance of tweeting firms in the years surrounding NPDs compared to a sample of matched control firms. In building the sample of NPDs, we supplement the primary sample with 639 neutral peer disclosures where the initial news triggered sizable negative market reactions for the tweeted firms. Starting with the 402 unique tweeting firm-years in the sample, we match each of the tweeting firms with a non-NPD-tweeting peer firm in the year of NPD (year t) using propensity score matching without replacement, and we require both tweeting and control firms to have data available to calculate firm financials in year $t-1$ and $t+1$. The basic matching variables include *Size*, *MB*, *Lev*, *ROA*, and *CFOA* in year $t-1$. When studying the product market outcomes, we further include each of them as a matching variable. Panel A reports the estimated propensity score distributions for the sample using the basic matching variables. Panel B reports differences in preevent basic characteristics for this sample. Panel C is a univariate DiD test of the changes in $\Delta AdjSale$ (industry-adjusted sales growth), $\Delta MktShr$ (market share growth), $\Delta Cntrct$ (sales contract growth), *ROA* (return-on-assets), and *CFOA* (cash flow-on-assets) from year $t-1$ to year $t+1$. Panel D is a multivariate DiD test of the changes in $\Delta AdjSale$, $\Delta MktShr$, $\Delta Cntrct$, *ROA*, and *CFOA* from year $t-2$ to year $t+2$ (excluding t). Samples in Panel D are populated from those in Panel C but further require both tweeting and control firms to have data available to calculate firm financials in year $t-2$ and $t+2$. *NPD* equals one for treatment firms and zero for control firms, *POST* equals one for posttreatment periods and zero for pretreatment periods, and $NPD \times POST$ is the DiD estimator. Controls include *Size*, *MB*, *ROA*, and *Lev* in columns (1)-(3) but exclude *ROA* in columns (4)-(5). Panel E reports the mean market- or industry-adjusted CARs to matched non-NPD-tweeting firms surrounding NPDs of tweeting firms. Each column in Panel E tests whether the market- or industry-adjusted CAR is significantly different from zero. Detailed variable definitions are in Appendix A of the main text. *p*-values are from the two-tailed tests in Panels A, B, and E and the one-tailed tests in Panels C-D.

Table OA16. Variables definitions

This appendix describes the calculation of variables used only in this online appendix. i denotes the focal firm, which decides whether to issue NPD upon receiving the news, j denotes the peer firm, and t denotes the fiscal year during which a tweet is issued for firm i and j .

Variable	Definition
$RetVol_t$	The stock return volatility for firm i during fiscal year t using daily returns.
$Analyst_t$	The natural logarithm of one plus the number of analysts whose forecasts of the firm's annual earnings are included in the latest consensus issued before the end of fiscal year t .
$InstHolding_t$	The percentage of shares owned by institutional investors at the end of fiscal year t .
$EarnVol_t$	The standard deviation of the earnings before extraordinary items and discontinued operations (\underline{IB}) divided by total assets from year $t-4$ to t , with a minimum requirement of three observations.
$ChEarn_t$	An indicator variable that equals one if earnings-per-share increases from fiscal year $t-1$ to t , and zero otherwise.
$Tech\ proximity_{18y_t}$	Similar to $Tech\ proximity$, except that patents are accumulated for the past 18 years.
$Tech\ proximity_{15y_t}$	Similar to $Tech\ proximity$, except that patents are accumulated for the past 15 years.