Internet searching and stock price crash risk: Evidence from a quasi-natural experiment

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1.Introduction

Background

- The ability to access information via the Internet has changed how both investors and financial markets work.
- Some studies suggest that searching for information online can direct the attention of investors and encourage their behavioral bias.
- Others find that Internet searching enables investors to process information more effectively

1.Introduction

Background

- Google unexpectedly withdrew its searching business from mainland China in 2010 after the failure of negotiations with the Chinese government regarding its censorship of Google's search results.
- Since Google's withdrawal, Baidu has dominated the searching business in mainland China.
- Google's withdrawal dramatically impeded the ability to search for information online by individuals in mainland China. –why?

1.Introduction

Background

	Baidu (N = 133,057)			Google (N = 108,496)		
Rank	Source	Percent	Cumulative percent	Source	Percent	Cumulative percent
1	Eastmoney.com	18.50	18.50	*Investing.com*	4.81	4.81
2	Advertisement	16.71	35.21	*Google*	4.81	9.61
3	10jqka.com.cn	9.73	44.94	*Morningstar*	3.22	12.83
4	Sina.com	7.15	52.09	*Bloomberg*	3.06	15.89
5	Jrj.com	3.62	55.72	Eastmoney.com	2.88	18.77

- Words in italics are international websites, others are located in mainland China.

1.Introduction

Background

- First, advertisements account for 16.71% of Baidu's search results, and Baidu inserts ads into its search results and benefits from deceptive ads (The Guardian, 2016).
- Second, results from Baidu's top five websites account for 55.72% of its results, while Google's top five account for only 18.77% of its results. We also find that Google must draw from its top 59 websites to return 55% of its search results. Search engines should provide a broad coverage of websites to provide meaningful results (Lawrence and Giles, 1999)
- Third, as Google is an international search engine, it shows results from both international and national (e.g., Eastmoney.com) websites in mainland China.

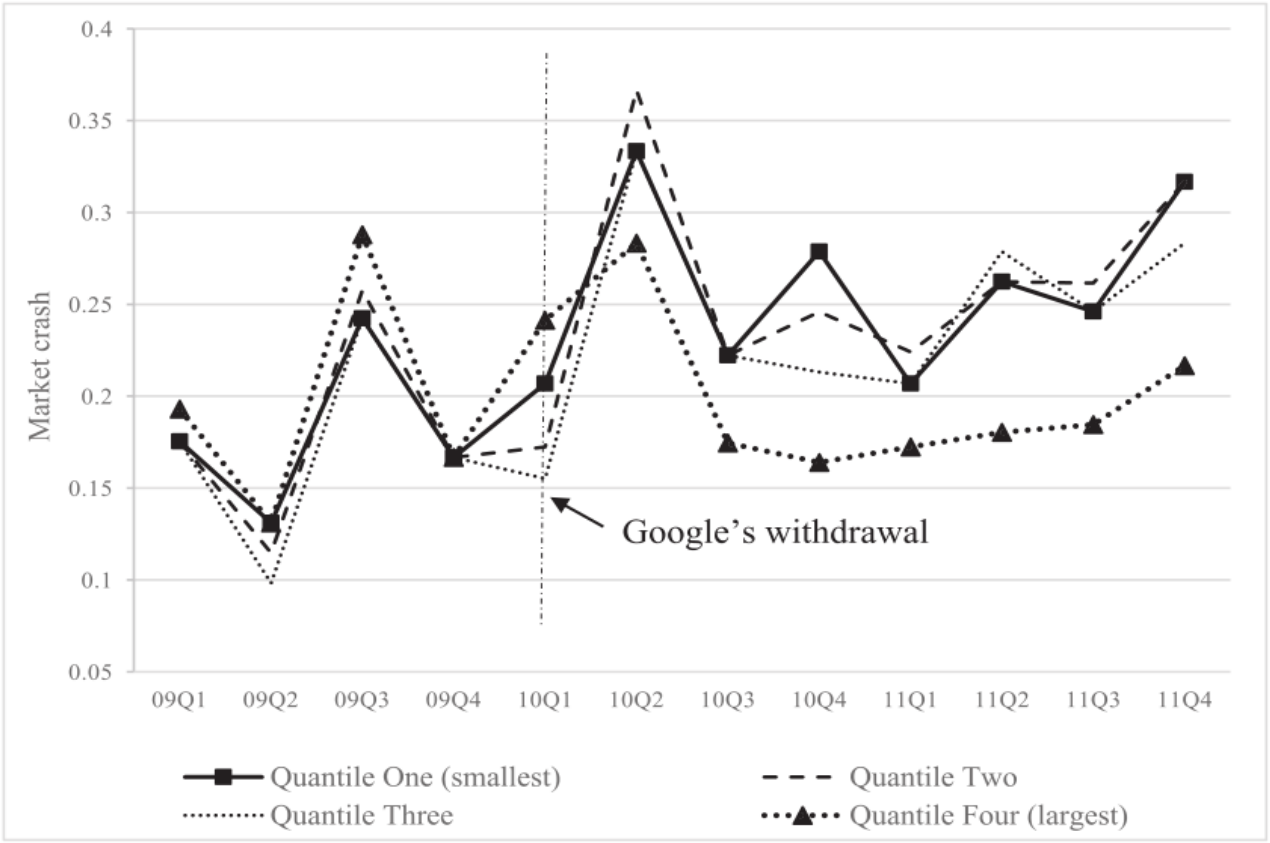
1.Introduction

Motivation

- Divide all A-share stocks into four quantiles. Quantile One (Quantile Four) represents the stocks with the lowest (highest) market capitalization.
- For each quantile portfolio, we calculate the value-weighted portfolio return for each day.
- For each portfolio, we define the market crash for each quarter (MARKET CRASH) as the proportion of days in a quarter when the daily portfolio return is less than −1%.

1.Introduction

Motivation



1.Introduction

Questions and Solutions

- What's the impact of Internet searching on the stock price crash risk?
  - ➢ difference-in-differences framework and several validation tests.
- What's the channels through which Internet searching affects the stock price crash risk?
  - ➢ cross-sectional tests.
- Whether Internet searching has other effects on the stock market?

1.Introduction

Contributions

- Provide further insights into the role of the Internet in individual financial decision making.

- Contribute to the literature on stock price crash risks.

2.Data

- All A-share listed companies in China, except for companies in the financial industry and special treatment (ST) and particular transfer (PT) companies.
- Starts from 2007 because a new set of accounting standards became effective then, and the dramatic stock split structure reform that transformed the Chinese stock market was implemented in 2005 and 2006 (Chen et al., 2012).
- Ends in 2014, as the Chinese stock market experienced a massive crash in 2015 due to margin trading (Bian et al., 2018), thus avoiding con- founding factors related to the stock price crash risk.

2.Data

treatment firms and control firms

- Define treatment (control) firms as those whose stock tickers have a higher (lower) search volume index (SVI) than the sample median in 2009.

- sample contains 833 (801) unique treatment (control) firms

2.Data

Variables

- define the firm-specific weekly returns(W), as the natural log of one plus the residual return from the following expanded market model regression(Jin and Myers (2006) , Hutton et al. (2009) and Kim et al. (2011a , b)):

$$r_{js} = \alpha_j + \beta_{1j} R_{m(s-2)} + \beta_{2j} R_{m(s-1)} + \beta_{3j} R_{ms} + \beta_{4j} R_{m(s+1)} + \beta_{5j} R_{m(s+2)} + \varepsilon_{js}, \quad (1)$$

- use rolling windows to estimate the stock price crash risk and and the corresponding estimation of regression Eq. (1) uses only data during the year.

2.Data

Variables : crash risk

- NCSKEW , the negative conditional skewness of firm-specific weekly returns.

$$NCSKEW_{jt} = -\left[n(n-1)^{\frac{3}{2}} \sum W_{js}^{3}\right] / \left[(n-1)(n-2)\left(\sum W_{js}^{2}\right)^{\frac{3}{2}}\right]. \quad (2)$$

- the down-to-up volatility (DUVOL), focuses on asymmetric volatilities between negative and positive firm-specific weekly returns (W).

$$DUVOL_{jt} = \log\left\{\left[(n_u - 1)\sum_{DOWN} W_{js}^{2}\right] / \left[(n_d - 1)\sum_{up} W_{js}^{2}\right]\right\}. \quad (3)$$

Variable name	Variable definition
W	Firm-specific weekly return, defined as the natural log of one plus the residual return from the expanded market model regression.
NCSKEW	Negative of the third moment of firm-specific weekly returns for each year, divided by the standard deviation of firm-specific weekly returns raised to the third power, for a given firm in a fiscal year. The larger the *NCSKEW*, the greater the stock price crash risk.
DUVOL	Natural logarithm of the ratio of the standard deviation on the down weeks to the standard deviation on the up weeks. The weeks with firm-specific weekly returns below (above) the annual mean are down (up) weeks. The larger the *DUVOL*, the greater the stock price crash risk.
TREAT	Indicator variable that equals one for treatment firms whose stock tickers have a higher search volume index than the sample median in 2009.
AFTER	Indicator variable that equals one for observations since 2010.
MB	Ratio of the market value to the book value of equity.
SOE	Indicator variable that equals one for firms with ultimate controlling shareholders that are government agencies.
SIZE	Natural logarithm of the total assets.
INSTITUTION	Number of shares held by all institutional investors divided by the total number of shares outstanding, multiplied by one hundred.
ANALYST	Number of analysts following a firm in a year.
SHAREHOLDER	Natural logarithm of the number of shareholders.
DA	Moving sum of the absolute value of discretionary accruals over the previous three years, where discretionary accruals are estimated from the modified Jones model.
SIGMA	Standard deviation of the firm-specific weekly returns in a year.
DTURN	Detrended annual share turnover, measured by the difference between the average monthly turnover in the current year and that in the previous year.
COMMENT	Natural logarithm of the number of investor comments in the East Money stock forum.
RET	Annual average firm-specific weekly returns, multiplied by one hundred.
LEV	Total liabilities divided by the total assets.
ROA	Net profit divided by the total assets.
AGE	Natural logarithm of the number of years since the firm was founded.
VOLATILITY	Standard deviation of raw weekly stock returns (percent) for the year.
YEARRETURN	Annual stock return (percent) for a firm.
TURNOVER	Annual average of monthly turnover, where monthly turnover is the monthly share trading volume divided by the number of tradable shares over the month.
AMIHUD	Annual average of the ratio of the absolute daily return (percent) to the daily trading volume [in millions of renminbi (RMB)].
MVE	Natural logarithm of market value for a firm.

2.Data

Matching

- For each treatment firm, we select a matched control firm based on a propensity score after a logit model is estimated.

Panel B: Balance tests (pre-matching)

	Mean		*t*-test	
Variable	Treated	Control	*t*-value	*p*-value
MB	2.331	1.954	4.15	0.000
SOE	0.639	0.725	−3.01	0.003
SIZE	21.891	21.874	0.24	0.807
INSTITUTION	40.842	37.835	2.16	0.031
ANALYST	10.011	6.164	6.36	0.000
DTURN	0.323	0.243	4.75	0.000
SHAREHOLDER	10.625	10.761	−2.66	0.008
DA	0.214	0.201	1.49	0.136
SIGMA	0.052	0.049	4.36	0.000
NCSKEW	−0.461	−0.514	1.61	0.107
DUVOL	−0.344	−0.369	1.01	0.314
COMMENT	10.215	10.053	3.59	0.000

Panel C: Balance tests (post-matching)

	Mean		*t*-test	
Variable	Treated	Control	*t*-value	*p*-value
MB	2.020	2.153	−1.26	0.209
SOE	0.696	0.663	0.86	0.389
SIZE	21.822	21.821	0.02	0.987
INSTITUTION	38.610	40.740	−1.16	0.248
ANALYST	6.527	7.604	−1.50	0.134
DTURN	0.267	0.284	−0.77	0.443
SHAREHOLDER	10.663	10.632	0.46	0.645
DA	0.197	0.208	−0.93	0.352
SIGMA	0.050	0.051	−0.41	0.683
NCSKEW	−0.482	−0.471	−0.25	0.806
DUVOL	−0.342	−0.328	−0.43	0.669
COMMENT	10.098	10.090	0.14	0.886

3. Empirical results

The effect of Internet searching on the stock price crash risk

- Model: $$Crash_{it} = \alpha + \gamma Treat_i * After_t + \beta X_{i(t-1)} + \mu_i + \mu_t + \varepsilon_{it}. \quad (4)$$

	NCSKEW (1)	*DUVOL* (2)	*NCSKEW* (3)	*DUVOL* (4)
*TREAT*AFTER*	0.079**	0.052**	0.122***	0.089***
	(2.17)	(1.97)	(2.74)	(2.83)
RET $_{t-1}$			1.317**	1.160***
			(2.19)	(2.62)
SIGMA $_{t-1}$			8.082**	7.192***
			(2.23)	(2.74)
SIZE $_{t-1}$			0.070	0.034
			(1.53)	(1.10)
LEV $_{t-1}$			−0.229	−0.085
			(−1.52)	(−0.76)
ROA $_{t-1}$			0.139	0.114
			(0.41)	(0.45)
MB $_{t-1}$			0.044**	0.030**
			(2.55)	(2.30)
DA $_{t-1}$			0.008	0.012
			(0.07)	(0.15)
AGE $_{t-1}$			0.095	0.166
			(0.34)	(0.89)
DTURN $_{t-1}$			−0.064	−0.039
			(−1.43)	(−1.21)
NCSKEW $_{t-1}$			−0.178***	−0.104***
			(−9.78)	(−8.37)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	4347	4347	3662	3662
Adj. R^2	0.115	0.110	0.117	0.115

3. Empirical results

Validation test 1:whether stock prices are more sensitive to negative posts.

	Full sample	Full sample	High *INSTITUTION*	Low *INSTITUTION*	High *ANALYST*	Low *ANALYST*
	RETURN (1)	*RETURN* (2)	*RETURN* (3)	*RETURN* (4)	*RETURN* (5)	*RETURN* (6)
NEGATIVE $_t$	−0.811***	−0.735***	−1.056***	−0.479***	−1.017***	−0.543***
	(−19.22)	(−16.41)	(−16.11)	(−6.82)	(−14.59)	(−7.86)
*AFTER*NEGATIVE* $_t$	−0.189***	−0.263***	−0.078	−0.369***	0.007	−0.447***
	(−3.91)	(−5.07)	(−0.95)	(−4.51)	(0.08)	(−5.51)
AFTER	1.084***	1.744***	0.973***	2.095***	0.507**	2.489***
	(6.70)	(10.09)	(3.79)	(7.21)	(1.98)	(8.84)
WEEKMVE $_t$	0.275***	0.366***	0.188**	0.364***	0.338***	0.365***
	(4.28)	(5.34)	(2.02)	(3.34)	(3.30)	(3.43)
WEEKTURN $_t$	0.127***	0.135***	0.151***	0.135***	0.159***	0.134***
	(56.05)	(54.83)	(34.38)	(36.49)	(36.68)	(37.57)
RETURN $_{t-1}$		−0.131***	−0.122***	−0.141***	−0.113***	−0.146***
		(−44.41)	(−26.31)	(−30.14)	(−26.25)	(−31.37)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Week fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	185,533	179,288	70,146	69,986	70,164	69,496
Adj. R^2	0.202	0.217	0.211	0.227	0.202	0.234

3. Empirical results

Validation test 2 : whether investors suffer from a deterioration in the information environment.

Panel A: Price movements before earnings announcements

	Earnings surprise < 0				Earnings surprise ≥ 0			
	CAR [−3,−2] (1)	CAR [−1,−1] (2)	CAR [−3,−2] (3)	CAR [−1,−1] (4)	CAR [−3,−2] (5)	CAR [−1,−1] (6)	CAR [−3,−2] (7)	CAR [−1,−1] (8)
*TREAT*AFTER*	0.0045**	0.0030**	0.0046**	0.0029**	0.0028	−0.0014	0.0026	−0.0012
	(2.18)	(2.13)	(2.22)	(2.05)	(1.41)	(−0.91)	(1.33)	(−0.80)
QMVE $_{t-1}$	−0.0008	−0.0002	−0.0003	−0.0001	−0.0046***	−0.0006	−0.0059***	−0.0009
	(−0.54)	(−0.24)	(−0.17)	(−0.07)	(−3.78)	(−0.62)	(−4.25)	(−0.90)
QMB $_{t-1}$			−0.0003	−0.0003			0.0001	0.0000
			(−0.53)	(−1.02)			(0.41)	(0.00)
QINSTITUTION $_{t-1}$			0.0031	0.0033			0.0046	−0.0002
			(0.79)	(1.25)			(1.16)	(−0.08)
EARNING_SD $_{t-1}$			−0.0052	0.0031			−0.0013	−0.0119**
			(−0.79)	(0.58)			(−0.21)	(−2.51)
DEARNING $_{t}$			0.0025	0.0072**			0.0201***	0.0108***
			(0.47)	(2.15)			(3.63)	(2.96)
LOSS $_{t}$			−0.0006	−0.0020*			−0.0029	−0.0032**
			(−0.42)	(−1.96)			(−1.49)	(−2.07)
DATEDIF $_{t}$			−0.0049*	−0.0071***			−0.0058***	−0.0024
			(−1.77)	(−3.46)			(−2.77)	(−1.35)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	6008	6008	5974	5974	6645	6645	6609	6609
Adj. R^2	0.0056	0.0046	0.0059	0.0094	0.0115	0.0060	0.0150	0.0089

3. Empirical results

Validation test 3 : whether firms with more retail investors to experience higher crash risks .

	High *INSTITUTION*	Low *INSTITUTION*	High *INSTITUTION*	Low *INSTITUTION*
	NCSKEW	*NCSKEW*	*DUVOL*	*DUVOL*
	(1)	(2)	(3)	(4)
*TREAT*AFTER*	0.083	0.150*	0.076	0.129**
	(1.22)	(1.91)	(1.59)	(2.33)
RET_{t-1}	1.419*	2.057**	1.580**	1.537**
	(1.66)	(2.18)	(2.47)	(2.19)
$SIGMA_{t-1}$	7.588	14.324**	8.842**	10.594**
	(1.44)	(2.52)	(2.29)	(2.59)
$SIZE_{t-1}$	0.090	0.074	0.029	0.035
	(1.16)	(0.99)	(0.54)	(0.64)
LEV_{t-1}	−0.277	−0.161	−0.121	−0.065
	(−1.20)	(−0.61)	(−0.70)	(−0.31)
ROA_{t-1}	0.814	−0.759	0.603	−0.446
	(1.58)	(−1.36)	(1.62)	(−1.07)
MB_{t-1}	0.051*	0.055**	0.037*	0.024
	(1.87)	(2.07)	(1.78)	(1.20)
DA_{t-1}	−0.185	−0.018	−0.090	0.013
	(−1.01)	(−0.10)	(−0.74)	(0.11)
AGE_{t-1}	0.395	0.273	0.382	0.224
	(0.87)	(0.66)	(1.23)	(0.81)
$DTURN_{t-1}$	0.016	0.020	0.004	0.018
	(0.20)	(0.27)	(0.08)	(0.35)
$NCSKEW_{t-1}$	−0.229***	−0.120***	−0.141***	−0.073***
	(−8.18)	(−4.11)	(−7.13)	(−3.67)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	1455	1454	1455	1454
Adj. R^2	0.146	0.116	0.138	0.118

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3. Empirical results

Cross-sectional test 1 : Earnings management

- firms engaging in earnings management are prone to stock price crashes, as managers can hide adverse news from investors.(Hutton et al. (2009))
- Xu et al. (2014) find that earnings management in Chinese listed companies damages the information environment of investors and amplifies the crash risk.
- We estimate the following cross-sectional model, which is a modified Jones model(Dechow et al., 1995 ; Kim et al., 201 1a , b ; Chen et al., 2018)

$$\frac{TACC_{jt}}{TA_{j(t-1)}} = \alpha \frac{1}{TA_{j(t-1)}} + \beta_1 \frac{\Delta SALE_{jt}}{TA_{j(t-1)}} + \beta_2 \frac{PPE_{jt}}{TA_{j(t-1)}} + \varepsilon_{jt}. \quad (5)$$

3. Empirical results

Cross-sectional test 1 : Earnings management

- We define Opaque as the absolute value of the discretionary accruals derived from Eq. (6) .

$$DiscAcc_{jt} = \frac{TACC_{jt}}{TA_{j(t-1)}} - \left(\hat{\alpha} \frac{1}{TA_{j(t-1)}} + \hat{\beta}_1 \frac{\Delta SALE_{jt} - \Delta REC_{jt}}{TA_{j(t-1)}} + \hat{\beta}_2 \frac{PPE_{jt}}{TA_{j(t-1)}} \right). \quad (6)$$

- separate our sample using Opaque for a firm in 2009.

3. Empirical results

Cross-sectional test 1 : Earnings management

Panel A: Earnings management

	High *Opaque*	Low *Opaque*	High *Opaque*	Low *Opaque*
	NCSKEW (1)	*NCSKEW* (2)	*DUVOL* (3)	*DUVOL* (4)
*TREAT*AFTER*	0.175***	0.069	0.127***	0.052
	(2.71)	(1.14)	(2.78)	(1.19)
RET_{t-1}	1.071	1.470*	1.024	1.224**
	(1.23)	(1.75)	(1.56)	(2.01)
$SIGMA_{t-1}$	7.432	7.823	7.089*	6.741*
	(1.41)	(1.55)	(1.83)	(1.88)
$SIZE_{t-1}$	−0.074	0.270***	−0.040	0.133***
	(−1.62)	(3.87)	(−1.20)	(2.68)
LEV_{t-1}	−0.213	−0.219	−0.042	−0.124
	(−1.02)	(−1.08)	(−0.26)	(−0.83)
ROA_{t-1}	0.196	0.095	0.155	0.077
	(0.44)	(0.19)	(0.48)	(0.20)
MB_{t-1}	0.039*	0.063**	0.026	0.040**
	(1.76)	(2.46)	(1.51)	(2.13)
DA_{t-1}	0.075	0.004	0.061	−0.047
	(0.48)	(0.02)	(0.59)	(−0.38)
AGE_{t-1}	0.096	−0.068	0.111	0.147
	(0.25)	(−0.17)	(0.42)	(0.56)
$DTURN_{t-1}$	−0.035	−0.084	0.016	−0.095**
	(−0.58)	(−1.27)	(0.37)	(−1.97)
$NCSKEW_{t-1}$	−0.169***	−0.193***	−0.092***	−0.119***
	(−6.36)	(−7.74)	(−5.09)	(−6.96)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	1794	1868	1794	1868
Adj. R^2	0.108	0.131	0.108	0.123

3. Empirical results

Cross-sectional test 1 : State control

- Politically connected firms can be reluctant to be transparent (Leuz and Oberholzer-Gee, 2006)
- politicians also can restrict the release of negative information by their affiliated firms around major political events (Piotroski et al., 2015).
- split our sample into two groups based on whether they are state-owned enterprises (SOEs) or non-state-owned enterprises (non-SOEs) in 2009.

3. Empirical results

Cross-sectional test 1 : State control

Panel B: State control

	SOE	*Non-SOE*	*SOE*	*Non-SOE*
	NCSKEW (1)	*NCSKEW* (2)	*DUVOL* (3)	*DUVOL* (4)
*TREAT*AFTER*	0.154***	0.049	0.122***	0.007
	(2.86)	(0.63)	(3.23)	(0.13)
RET_{t-1}	1.804**	0.177	1.458***	0.532
	(2.54)	(0.16)	(2.79)	(0.63)
$SIGMA_{t-1}$	10.951**	1.501	8.923***	3.767
	(2.53)	(0.23)	(2.87)	(0.76)
$SIZE_{t-1}$	0.006	0.206**	−0.002	0.119**
	(0.10)	(2.43)	(−0.05)	(2.57)
LEV_{t-1}	−0.104	−0.460*	0.065	−0.346**
	(−0.55)	(−1.92)	(0.46)	(−1.98)
ROA_{t-1}	0.363	−0.396	0.359	−0.360
	(0.88)	(−0.73)	(1.16)	(−0.91)
MB_{t-1}	0.046**	0.054*	0.028*	0.038*
	(2.23)	(1.90)	(1.86)	(1.80)
DA_{t-1}	0.083	−0.197	0.053	−0.113
	(0.59)	(−0.96)	(0.55)	(−0.87)
AGE_{t-1}	0.213	−0.286	0.318	−0.232
	(0.68)	(−0.51)	(1.47)	(−0.63)
$DTURN_{t-1}$	−0.046	−0.104	−0.023	−0.078
	(−0.82)	(−1.38)	(−0.56)	(−1.45)
$NCSKEW_{t-1}$	−0.143***	−0.265***	−0.086***	−0.147***
	(−6.61)	(−8.85)	(−5.85)	(−6.63)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	2582	1080	2582	1080
Adj. R^2	0.127	0.104	0.133	0.081

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3. Empirical results

Cross-sectional test 2 : Analyst recommendations

- Although investors rely on analyst recommendations when making their investment decisions (Womack, 1996), analysts could have incentives to provide overoptimistic recommendations (Easterwood and Nutt, 1999).
- divide our sample by BuyReco , which is the net buy recommendation ratio for a firm in 2009.

3. Empirical results

Cross-sectional test 2 : Analyst recommendations

Panel A: Analyst recommendations

	High *BuyReco*	Low *BuyReco*	High *BuyReco*	Low *BuyReco*
	NCSKEW (1)	*NCSKEW* (2)	*DUVOL* (3)	*DUVOL* (4)
*TREAT*AFTER*	0.146**	0.081	0.115***	0.045
	(2.32)	(1.17)	(2.62)	(0.90)
RET_{t-1}	1.296	1.391	1.444**	0.837
	(1.58)	(1.51)	(2.39)	(1.25)
$SIGMA_{t-1}$	7.751	7.981	8.463**	5.251
	(1.57)	(1.43)	(2.40)	(1.31)
$SIZE_{t-1}$	0.107*	−0.019	0.061	−0.013
	(1.69)	(−0.28)	(1.40)	(−0.28)
LEV_{t-1}	−0.314	0.023	−0.242	0.163
	(−1.49)	(0.11)	(−1.49)	(1.04)
ROA_{t-1}	−0.162	0.164	−0.172	0.206
	(−0.31)	(0.35)	(−0.49)	(0.60)
MB_{t-1}	0.068**	0.037*	0.049***	0.019
	(2.51)	(1.76)	(2.63)	(1.22)
DA_{t-1}	−0.098	0.072	−0.041	0.013
	(−0.64)	(0.40)	(−0.37)	(0.11)
AGE_{t-1}	0.439	−0.032	0.309	0.079
	(1.02)	(−0.08)	(1.08)	(0.30)
$DTURN_{t-1}$	−0.058	−0.048	−0.043	−0.029
	(−0.79)	(−0.72)	(−0.81)	(−0.60)
$NCSKEW_{t-1}$	−0.200***	−0.167***	−0.112***	−0.101***
	(−7.37)	(−6.36)	(−5.91)	(−5.72)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	1750	1691	1750	1691
Adj. R^2	0.144	0.097	0.145	0.091

3. Empirical results

Cross-sectional test 2 : Media coverage

- Tetlock et al. (2008) find that the proportion of negative words used in news stories can predict future earnings and stock returns.
- Fang and Peress (2009) find that stocks with no media coverage earn higher returns than those with high levels of coverage, implying that media coverage helps investors process information and improves market efficiency.
- We use Media, the number of online financial media articles related to a firm, to proxy for the media coverage of the firm and separate our sample based on the median number of Media in 2009.

3. Empirical results

Cross-sectional test 2 : Media coverage

Panel B: Media coverage

	High *Media*	Low *Media*	High *Media*	Low *Media*
	NCSKEW (1)	*NCSKEW* (2)	*DUVOL* (3)	*DUVOL* (4)
*TREAT*AFTER*	0.080	0.177***	0.085*	0.099**
	(1.20)	(2.97)	(1.83)	(2.28)
RET $_{t-1}$	2.298***	0.285	2.102***	0.236
	(2.85)	(0.33)	(3.54)	(0.36)
SIGMA $_{t-1}$	14.046***	2.124	13.017***	1.695
	(2.89)	(0.40)	(3.71)	(0.44)
SIZE $_{t-1}$	0.146**	−0.003	0.077	−0.006
	(2.04)	(−0.05)	(1.58)	(−0.16)
LEV $_{t-1}$	−0.274	−0.180	−0.112	−0.049
	(−1.32)	(−0.84)	(−0.70)	(−0.32)
ROA $_{t-1}$	0.210	0.091	0.017	0.194
	(0.42)	(0.19)	(0.05)	(0.50)
MB $_{t-1}$	0.066**	0.022	0.047**	0.014
	(2.49)	(1.01)	(2.47)	(0.84)
DA $_{t-1}$	−0.020	−0.007	−0.006	0.010
	(−0.12)	(−0.04)	(−0.05)	(0.09)
AGE $_{t-1}$	0.151	0.068	0.329	0.012
	(0.42)	(0.16)	(1.39)	(0.04)
DTURN $_{t-1}$	−0.050	−0.083	−0.058	−0.024
	(−0.76)	(−1.32)	(−1.16)	(−0.55)
NCSKEW $_{t-1}$	−0.191***	−0.170***	−0.122***	−0.086***
	(−7.61)	(−6.34)	(−7.07)	(−4.75)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
N	1842	1806	1842	1806
Adj. R^2	0.130	0.110	0.133	0.099

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4. Conclusion

- Internet searching can mitigate stock price crash risk, helps investors collect and process information.
- The effect of Internet searching on the stock price crash risk occurs only after Google's withdrawal and not before, implying a causal relation between the two.
- the effect is greater when firms are more likely to hide adverse information and when information intermediaries are less effective in assisting investors to acquire and process information.