What Do Employees Know? Evidence from a Social Media Platform

Kelly Huang, Meng Li, Stanimir Markov
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Long Zhen

Comparison

- Green et al. 2019
  - Outlook & Rating
  - ROA & return
- Chen et al. 2020
  - Outlook & Rating
  - Cross-section & Index

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Introduction – Backgrounds

- The significance of social media in capital markets.
  - Seeking Alpha and Estimize(Chen et al. 2014; Jame et al. 2016)
- Employee disclosures could be a source of information
- Glassdoor.com

- whether rank-and file employees are, on average, informed about overall firm performance
  - Hales, Moon, and Swenson (2018) and Green et al. (2019) analyze data from Glassdoor.com and find that employee disclosures are useful in predicting operating and stock performance

Introduction – Motivation

- Strengthen the case that employee disclosures have predictability;
- Investigate the nature of the information possessed by employees.

Introduction – Research Problem

- Whether employees' outlook has predictability about firm performance?
  - Yes
- Whether the amount of information embedded in employee outlook varies systematically across employees?
  - Full-time employees, employees with longer tenure, and employees with higher education
- Which kind of information are more sensitive? Good or bad news?
  - Bad news

Research Design – Data

- 2012.5 ~ 2016.12
- Compustat
- Glassdoor.com
  - Exclude former employees who departed more than 2 years age
  - Drop firms with fewer than 3 reviews or with insufficient Compustat control variables or missing stock returns
- 572,262 individual employee predictions
  - Get better/stay the same/get worse: +1, 0 and -1
- 2,270 unique companies
  - 61% of the market capitalization

Research Design

- H1: Employee outlook is informative about firm future performance.

$$AvgROA_{i,t+1,t+2} = \beta_0 + \beta_1 Outlook_{i,t} + \boldsymbol{\beta_2 Controls_{i,t}} + \sum Industry\ FE + \sum Time\ FE + \varepsilon_{i,t+1,t+2},$$

- H2: aggregates a larger, more diverse, and more knowledgeable opinion base, the more informative

include an interaction term between *Outlook* and *NumReviewer*, *HI_ReviewerState*, *HI_ReviewerJob*, and *EmpStockOption*, separately

- H3: Full-time, longer tenure, higher education, management positions, and located in headquarter states employees are more informative

- H4: Employee outlook provided by employees from a specific functional area is more informative about the component of firm performance closely related to that function.
- H5: Employee outlook is more informative about future bad news than good news.

→ whether and to what extent investors use this information?

- RETURN PREDICTION ANALYSES

$$CAR_{i,t+1,t+2} = \beta_0 + \beta_1 Outlook_{i,t} + \beta_2 Controls_{i,t} + \sum Industry\ FE + \sum Time\ FE + \varepsilon_{i,,t+1,t+2},$$

CAR is the average of three-day buy-and-hold market-adjusted stock returns surrounding the announcement of earnings for quarters t+1 and t+2

- We construct spread portfolios that buy stocks in the top decile of outlook and sell stocks in the bottom decile

Table 3: predicting future operating performance

	Dependent Variable: $AvgROA_{(t+1, t+2)}$		
	(1)	(2)	(3)
Outlook	**0.0028*** **	**0.0033*** **	**0.0040*** **
	(5.93)	(4.94)	(3.48)
AFNews Analyst forecast news	0.2497***	0.2873***	0.3895***
	(8.11)	(6.98)	(3.36)
MFNews Management forecast news	0.1708***	0.1619***	0.092**
	(5.35)	(3.66)	(2.47)
InsiderNetBuy Net insider purchases	0.0001***	0.0001	0.0002*
	(3.17)	(1.51)	(1.77)

- H1: Outlook has significant incremental predictive value relative to other major information sources

Table 4: Predicting Future Operating Performance: Wisdom of Crowds Analysis

	Dependent Variable: $AvgROA_{(t+1, t+2)}$			
	(1)	(2)	(3)	(4)
Outlook	0.0011	0.0038***	0.0035***	0.0027**
	(1.12)	(3.15)	(2.69)	(2.04)
NumReviewer	0.0004			
	(0.58)			
Outlook * NumReviewer	**0.0025****			
	(2.01)			
HI_ReviewerState		-0.0006		
		(0.90)		
Outlook * HI_ReviewerState		**-0.0029****		
		(2.28)		
HI_ReviewerJob			0.0001	
			(0.19)	
Outlook * HI_ReviewerJob			**-0.0021***	
			(1.67)	
EmpStockOption				-0.0023***
				(2.96)
Outlook * EmpStockOption				**0.0031****
				(2.11)

Herfindahl index of reviewer job locations

job titles

the number of employee stock options

Each variable is converted to quintile ranks and transformed into values of 0, 0.25, 0.5, 0.75, and 1

- H2: the information content of Outlook increases with the size and diversity of the reviewer base and with employees' knowledge of firm performance.

Table 5: Predicting Future Operating Performance: Reviewer Attribute Analysis

	Dependent Variable: *AvgROA*$_{(t+1, t+2)}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Outlook	0.0029***	0.0027***	0.0037***	0.0039***	0.0030***	0.0024
	(2.89)	(3.81)	(4.70)	(5.48)	(4.11)	(1.25)
Outlook_Fulltime	**0.0019*** **					
	(2.67)					
Outlook_LongTenure three or more years of firm experience		**0.0010** **				
		(2.38)				
Outlook_HighEducation a master's or doctoral degree			**0.0006***			
			(1.85)			
Outlook_Manager				**0.0001**		
				(0.34)		
Outlook_Headquarter					**0.0005**	
					(1.46)	
Outlook_Factor principal component analysis						**0.0006** **
						(2.04)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry/Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,573	18,049	10,331	15,120	13,912	5,450
Adjusted R^2	0.435	0.460	0.478	0.456	0.456	0.464

- H3: The information content of employee outlook varies systematically in relation to employee attributes.

Sales-sales growth
Production-cost of goods sold
R&D- R&D expenditure
Supply chain- inventory turnover

Table 6: Job Function Analysis across Different Aspects of Operating Performance

	Dependent Variable:			
	AvgSG	***AvgCOGS***	***AvgR&D***	***AvgInvTurn***
	(1)	(2)	(3)	(4)
Outlook	0.0650***	-0.0613***	0.0268***	0.1518
	(14.38)	(4.52)	(5.09)	(1.04)
Outlook_Sale	**0.0027***			
	(1.65)			
Outlook_Production		**-0.0119*****		
		(3.46)		
Outlook_R&D			**0.0028****	
			(2.01)	
Outlook_Supchain				**0.0806****
				(2.01)
Controls	Yes	Yes	Yes	Yes
Industry/Time FE	Yes	Yes	Yes	Yes
Observations	10,653	4,481	8,909	2,668
Adjusted R^2	0.281	0.568	0.482	0.867

Table 7: Predicting Future Operating Performance: Sample Split on Outlook

	Dependent Variable: *AvgROA* *(t+1, t+2)*			
	Positive	**Non-Positive**	**Above Median**	**At or Below Median**
	(1)	(2)	(3)	(4)
Outlook	**0.0017****	**0.0044*****	**0.0014**	**0.0048*****
	(2.29)	(3.84)	(1.48)	(5.27)
Dif. in |coeff.|	***Outlook* (2)-(1)**	**0.0027****	***Outlook* (4)-(3)**	**0.0034*****

	Dependent Variable:			
	CR_Up	***CR_Down***	***DIV_Incr***	***DIV_Decr***
	(1)	(2)	(3)	(4)
Outlook	**0.0671**	**-0.4074*****	**0.1086****	**-0.3029*****
	(1.09)	(6.50)	(2.31)	(3.77)

- Outlook is a strong predictor of extreme bad events

Table 9: Predicting Future Stock Returns: Earnings Announcement Analysis

	Dependent Variable: $AvgCAR_{(-1,1)}$		
	Full Sample	**Low Analyst Coverage**	**Small Market Cap**
	(1)	(2)	(3)
Outlook	**0.0009**	**0.0058*** **	**0.0045** **
	(0.84)	(3.54)	(2.49)

- Outlook predicts earnings announcement returns only in the subsamples of small stocks and stocks with low analyst coverage;

Predicting Future Stock Returns: Hedge Portfolio Analysis

Panel A: Alphas from Fama-French Four Factor Model

	Full Sample	**Low Analyst Coverage**	**Small Market Cap**
	(1)	(2)	(3)
Equal-weighted	0.0035*	0.0058**	0.0073***
	(1.82)	(2.09)	(3.17)
ReviewFrequency-weighted	0.0032	0.0087*	0.0078*
	(1.38)	(1.69)	(1.75)

Panel B: Coefficients from Fama-MacBeth Regressions

	Dependent Variable: *AbnRET*		
	Full Sample	**Low Analyst Coverage**	**Small Market Cap**
	(1)	(2)	(3)
Outlook	**0.0028**	**0.0155****	**0.0208****
	(0.56)	(2.06)	(2.26)
ROA	0.0021	0.0179	0.0021
	(0.2)	(1.6)	(0.13)
LogSale	0.0042	-0.0052	0.0139

Conclusion

- Average employee outlook is incrementally informative in predicting future operating performance and stock return
- Its information content is greater when aggregated from a larger, more diverse, more knowledgeable employee base, consistent with the wisdom of crowds phenomenon
- Average outlook predicts bad news events more strongly than good news events