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Employees' reviews and stock price informativeness

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ABSTRACT

We investigate the relationship between employee reviews and stock price informativeness. Using a sample of US firms, we find that firms with higher employee satisfaction are associated with greater stock price informativeness in terms of idiosyncratic volatility. We find this result to be more pronounced for firms that have a greater reliance on human capital assets. Overall, our study suggests that employee reviews have implications for financial markets.

1. Introduction

Investors have typically evaluated a company's prospects by looking at its financial statements, analyst forecasts, credit ratings, and industry news. However, there is a growing understanding that non-financial data, such as employee reviews, can provide insightful information about a company's internal operations and future performance. The insights shared by employees on social media platforms can be valuable in understanding the operational performance and returns of companies. The emergence of platforms like Glassdoor since 2008 has provided employees with a means to anonymously review their company's performance, thereby enhancing the overall information environment facing firms. Employees possess private information that is typically unavailable to external parties or may not be reflected in traditional reports and financial statements. We perceive online employee reviews as publicly available information accessible to equity market investors, enabling them to assess the equity value of a firm. Human relations theories argue that employee satisfaction can induce effort and lead to high employee retention. Fauver et al. (2018) find that firms with more satisfied employees perform better than firms with less employee-friendly cultures. This performance can be linked to factors such as effective workforce management, improved technical efficiency, innovative practices, and employee flexibility. Wei et al. (2020) also find that corporations with higher employee welfare have better innovation performances.

In this study, we test whether employee reviews affect the stock price informativeness of firms. The concept of stock price informativeness suggests that stock prices are mainly driven by two factors — market factors and factors that are idiosyncratic to the firm. The latter refers to how individual stock prices move in response to firm-specific corporate information. Stock price informativeness is important for several reasons but more importantly, it ensures that a company's market valuation aligns with its intrinsic value, helps investors make informed decisions, and ensures transparency. When employees rate their firms positively, it signifies employee satisfaction and could also signify a positive perception of the firm's performance and work environment. This perception is likely to align with the actual performance of the firm. Hence, stock market participants, including investors, may consider these employee ratings as reliable indicators of the firm's prospects. This in turn enhances the corporate information environment thereby leading to an increase in stock price informativeness.

We use employee review data from Glassdoor for a sample of S&P 500 firms between 2008 and 2021 to conduct our analysis. Our results show that there is a significantly positive relationship between employee satisfaction and stock price informativeness, suggesting that positive employee reviews increase the ability of stock prices to incorporate firm-specific information. We also find that the results are more pronounced for firms that rely more on human capital for competitive advantage. Our paper makes two major contributions to the literature. Firstly, we add to the growing literature on the role of employee satisfaction in financial markets (Green et al., 2019; Symitsi et al., 2018; Edmans, 2011). Our study extends this strand of literature by showing that employee satisfaction is an important factor that affects stock price informativeness in equity markets. Secondly, we contribute

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to the studies that show the informational value of online employee reviews (Symitsi et al., 2021). Symitsi et al. (2021) find that information from employees can be of value for key managerial issues such as firm profitability, employee turnover, and investment decisions. Our study shows that information from employees can also be of value to investors as it helps improve a firm's information environment thereby enhancing stock price informativeness.

2. Data and methodology

We obtain data on employee reviews from Glassdoor.com for companies in the S&P 500 index during the period 2008 to 2021. The sample begins in 2008 because that is the year Glassdoor was launched. To ensure accuracy, we manually confirm each company's name, industry, and logo on the Glassdoor website. For each firm, we download all reviews made by employees during the sample period. We exclude firms with less than ten reviews for the whole sample period. We then aggregate reviews by firm and year. Overall, this yields 296,698 reviews. Consistent with Kim and Ra (2022), we use the overall employee rating on Glassdoor. The ratings are on a five-point scale with 1 being least favourable and 5 being most favourable. To obtain a score for each firm per year, we compute the yearly average of all rating scores for each firm. Finally, we merge our employee review data with firm financial data from Compustat and stock price data from the Centre for Research in Security Prices (CRSP). This process yields 2425 firm-year observations for 292 unique firms.

To measure stock price informativeness, we use idiosyncratic volatility by computing the proportion of firm stock return variation that is unexplained by market factors. First proposed by Roll (1988) and further developed by Morck et al. (2000), this measure relies on the R^2 from a regression of a firm's stock returns on some measure of market returns. A low R^2 implies higher idiosyncratic volatility which also implies a greater informativeness of stock prices, as market-wide factors will then explain only a smaller proportion of the stock's returns. We compute R^2 from two models. Firstly, following Chan and Hameed (2006), we estimate a market model regression as follows:

$$r_{it} = \alpha_i + \beta_i RM_t + \epsilon_{it} \quad (1)$$

where in each year for firm i, r is the return on day t, and RM is the return on the S & P market index.

Secondly, we also follow Le et al. (2021), and estimate the following Fama and French three-factor model:

$$r^d_{i,t} - r^f_{i,t} = \alpha_{i,t} + \beta_{mkt,i,t}(r^d_{mkt,t} - r^d_{f,t}) + \beta_{smb,i,t} r^d_{smb,t} + \beta_{hml,i,t} r^d_{hml,t} + +\epsilon^d_{i,t}, \quad (2)$$

Where $r^d_{i,t}$ is the daily return for firm i on day d of year t, and $r^d_{f,t}$ is the daily risk-free rate. The variables $r^d_{mkt,t}$, $r^d_{smb,t}$, $r^d_{hml,t}$ are daily returns on the market, the small-minus-big factor, and the high-minus-low factors respectively.

To determine stock price informativeness, we then compute 1-R^2, which captures the ratio of the volatility of residuals to total stock return volatility. Finally and consistent with the literature, we logistically transform 1-R^2 since it is bounded between 0 and 1. Thus, we compute stock price informativeness as follows:

$$SPI = ln\left(\frac{1 - R^2}{R^2}\right) \quad (3)$$

where for each firm i, R^2 is obtained from either Eq. (1) or Eq. (2).

We then test for the relationship between employee satisfaction and stock price informativeness by estimating the following model:

$$SPI_{it} = \alpha + \beta EmployeeSatisfaction_{it} + \gamma X_{it} + Year + Industry + \varepsilon_{it} \quad (4)$$

Where SPI (Stock Price Informativeness) is the logistically transformed 1-R^2, obtained from Eqs. (1) and (2). X_{it} is a vector of control variables defined as follows: *Firm Size* is the log of total assets. *Age* is the log of the number of years since the firm was included in Compustat. *Market to Book* is the ratio of market value to book value of equity. *Leverage* is the ratio of total debt to total assets. *ROE* is the ratio of net income to book shareholders' equity. Investment is the change in capital expenditure scaled by total assets. *Dividends* is the ratio of cash dividends to total assets. *Non-zero Ret Days* is the proportion of trading days in a given year of the firm where it experienced a change in price.

Table 1
Summary statistics.
This table provides summary statistics. of variables used. *Employee Satisfaction* is the yearly average overall ratings for each firm obtained from Glassdoor. *Firm Size* is the log of total assets. *Age* is the log of the number of years since the firm was included in Compustat. *Market to Book* is the ratio of market value to book value of equity. *Leverage* is the ratio of total debt to total assets. *ROE* is the ratio of net income to book shareholders' equity. *Investment* is the change in capital expenditure scaled by total assets. *Dividends* is the ratio of cash dividends to total assets. *Non-zero Ret Days* is the percentage proportion of trading days of the firm where it experienced a change in price.

Variables	N	Mean	SD	Median	Min	Max
Market Model R-Squared	2425	0.367	0.172	0.362	0.000	0.842
FF Model R-squared	2425	0.388	0.159	0.391	0.003	0.638
SPI (Market Model)	2425	0.666	0.943	0.567	−1.672	8.621
SPI (FF Model)	2425	0.539	0.801	0.441	−0.565	5.759
Employee Satisfaction	2425	3.340	0.526	3.375	1.000	5.000
Firm Size	2425	9.268	1.358	9.175	4.791	13.184
Age	2425	3.389	0.629	3.497	0.693	4.094
Market to Book	2425	2.531	1.461	2.076	0.648	11.592
Leverage	2425	0.221	0.151	0.208	0.000	0.661
ROE	2425	0.231	0.523	0.174	−1.517	3.918
Investment	2425	−0.039	0.341	0.000	−5.439	3.285
Dividends	2425	0.025	0.034	0.017	0.000	0.639
Non zero Ret. Days	2425	0.993	0.009	0.996	0.837	1.000

3. Results

Table 1 presents summary statistics of our variables. The mean R square is 0.367 and 0.388 for the market model and Fama and French models respectively. This suggests that over 60% (1-R^2) of variations of the average firm cannot be explained by market factors. The average SPI, the logistical transformation of the R^2 is 0.666 and 0.539 respectively for the market model and Fama and French models. The average overall employee rating for firms in our sample is 3.34. This figure is comparable to those reported in previous studies that also use employee rating data for US companies obtained from Glassdoor (eg. Kim and Ra, 2022). Summary statistics of the remaining variables are generally consistent with the literature.

Table 2 presents the results of our regressions to test the relationship between employee satisfaction and stock price informativeness. Columns 1 and 2 use stock price informativeness computed from the Market Model and Fama and French (FF) models respectively. The table shows that the coefficients associated with Employee Satisfaction are positive and statistically significant. This implies that when employees rate their firms more favourably, it signals higher levels of employee satisfaction and a favourable perception of the firm's overall performance and work environment. As a result, investors and other market participants are likely to perceive employee ratings as favourable signals of the firm's prospects, thereby potentially augmenting the level of stock price informativeness. Thus, the results from Table 2 confirm our predictions that employee satisfaction, as measured by higher employee ratings, enhances the corporate information environment.

We next explore whether the relationship between employee satisfaction and stock price informativeness varies amongst firms with different levels of reliance on human capital. Firms differ in their reliance on human capital assets to maintain a competitive advantage (Ghaly et al., 2017). These variations in human capital intensity are likely to create differences in the potential implications of employee satisfaction for firm-level outcomes. To this end, we hypothesize that if employee satisfaction is important enough to affect firms' information environment and improve stock price informativeness, we should observe this relationship to be stronger amongst firms that rely more on

Table 2
Employee satisfaction and stock price informativeness.
This table presents the results of the regressions that estimate the effect of employee satisfaction on stock price informativeness. The dependent variable is the logistic transformation of 1-R^2, which is obtained from both the Market model and the Fama and French three-factor models. The independent variable of interest, Employee Satisfaction, is the overall employee ratings obtained from Glassdoor. Robust standard errors are in parentheses.

	Dependent variable: SPI	
	Market Model	FF Model
	(1)	(2)
Employee Satisfaction	0.080**	0.073***
	(0.039)	(0.027)
Firm Size	−0.049***	−0.052***
	(0.013)	(0.012)
Age	−0.162***	−0.128***
	(0.028)	(0.023)
Market to Book	−0.016	−0.042***
	(0.014)	(0.012)
Leverage	0.283***	0.304***
	(0.105)	(0.093)
ROE	0.017	0.018
	(0.036)	(0.030)
Investment	0.162***	0.158***
	(0.042)	(0.035)
Dividends	−0.535	−0.286
	(0.541)	(0.491)
Non-zero Ret. Days	−5.947	−3.381*
	(3.680)	(1.743)
Constant	7.047*	4.358**
	(3.726)	(1.726)
Year FE	Yes	Yes
Industry FE	Yes	Yes
N	2425	2425
Adj R^2	0.451	0.437

*** Denote statistical significance at the 1%.
** Denote statistical significance at the 5%.
* Denote statistical significance at the 10%.

Table 3
The role of human capital intensity.
This table presents the results of the regressions that estimate the effect of employee satisfaction on stock price informativeness for high versus low labour intensity firms. The dependent variable is the logistic transformation of 1-R^2, which is obtained from both the Market model and the Fama and French three-factor models. The independent variable of interest, Employee Satisfaction, is the overall employee ratings obtained from Glassdoor. Robust standard errors are in parentheses.

Variables	Dependent Variable: SPI			
	Market Model		FF Model	
	(Low)	(High)	(Low)	(High)
Employee Satisfaction	0.020	0.123***	0.038	0.098**
	(0.059)	(0.047)	(0.036)	(0.040)
Firm Size	−0.033	−0.057***	−0.032*	−0.061***
	(0.021)	(0.017)	(0.018)	(0.015)
Age	−0.141***	−0.162***	−0.109***	−0.133***
	(0.039)	(0.038)	(0.032)	(0.034)
Market to Book	−0.030	0.010	−0.027	−0.033**
	(0.023)	(0.017)	(0.019)	(0.015)
Leverage	0.318**	0.144	0.357***	0.162
	(0.143)	(0.154)	(0.125)	(0.138)
ROE	−0.062*	0.100*	−0.047	0.085*
	(0.035)	(0.060)	(0.031)	(0.050)
Investment	0.185***	0.105**	0.174***	0.114***
	(0.065)	(0.051)	(0.058)	(0.041)
Dividends	−1.355	0.717	−1.249	0.723
	(0.878)	(0.533)	(0.840)	(0.464)
Non-zero Ret. Days	−4.089	−9.454***	0.072	−8.547***
	(6.970)	(2.062)	(2.349)	(2.043)
Constant	5.154	10.501***	0.701	9.552***
	(7.020)	(2.025)	(2.325)	(2.012)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	1212	1213	1212	1213
Adj R^2	0.477	0.457	0.506	0.400

*** Denote statistical significance at the 1%.
** Denote statistical significance at the 5%.
* Denote statistical significance at the 10%.

human capital to maintain a competitive advantage. Logically, the enhanced information environment created by positive employee reviews will be of more relevance to market participants in situations where firms rely more on their human capital assets. To test the moderating effect of human capital reliance on the relationship between employee satisfaction and stock price informativeness, we split our sample into low and high human capital-reliance firms using the ratio of R&D to total assets. We then rerun our regression for each sub-sample. The results of this analysis are presented in Table 3. As can be seen from the table, co-efficient estimates of our variable of interest, Employee Satisfaction, are not statistically significant for firms in the low human capital intensity sub-sample but are positive and statistically significant for those in the high sub-sample. Thus, the relationship between employee ratings and stock price informativeness can be said to be more pronounced in firms where human capital is a more critical tool for competitive advantage.

4. Conclusion

In this study, we investigate whether there is any relationship between employee reviews and stock price informativeness. We conjecture that employee reviews help to enhance a firm's information environment, thereby facilitating the incorporation of firm-specific information into the stock price. Using a sample of US firms and ratings data from Glassdoor, we find a positive relationship between employee satisfaction and stock price informativeness as measured by idiosyncratic volatility. Our results also show that this relationship is more pronounced for firms that have a greater reliance on human capital assets. Our findings therefore provide another strand of evidence to support the growing implications of employee satisfaction for firms and financial markets. One important implication for firms is that employee reviews contribute to the stock price discovery process as better employee reviews would imply that firms' stock prices will rely less on market indices but more on the firm's intrinsic prospects. In terms of financial markets more generally, our findings imply that employee reviews may contribute to market efficiency and the protection that it provides to investors in relation to more fairer valuation of equity assets. Our findings also open up avenues for future research. For example, a larger study could rely on cross-country data to explore variations in employee conditions in different geographical locations.

Data availability

Data will be made available on request.

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