Employees' online reviews and equity prices

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Abstract

We examine the effect of employee satisfaction on corporate performance using employees' online reviews. Our results indicate that although employee satisfaction positively impacts corporate performance, this is not fully reflected in equity prices.

JEL classification: G01; G03; M05

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1. Introduction

We investigate the relationship between employee satisfaction and long–run equity returns using an extensive dataset of employees' online reviews for US public firms posted on Glassdoor over the period from 2009 to 2016. We find a statistically significant positive association between average employee satisfaction rating and corporate performance (ROA and Tobin's q). This is robust to controlling for firm characteristics, review volume, industry and time fixed–effects. Then, we assess the performance of portfolios that include the stocks of the best firms in our sample in terms of employee satisfaction rating. Over the eight–year period under scrutiny, a value–weighted portfolio earned on average a monthly four–factor alpha of 1.35%. Higher abnormal returns are obtained in the case of an equally–weighted portfolio, when using instead of Carhart's four–factor model either Fama–French's three-factor model or the CAPM, and when review volume is taken under consideration when constructing the portfolios.

These findings allow us to make three main contributions to the literature on employee satisfaction, human capital and intangibles in general. First, our analysis suggests that firms rated highly by their current employees in terms of satisfaction achieve superior financial performance relative to firms characterised by low levels of employee satisfaction. Thus, we provide further evidence in support of those advocating a human capital–centred view of the firm (e.g., Zingales, 2000), according to which employees should not be considered expendable commodities, as is the case in the traditional view, but rather key organisational assets who can contribute significantly to firm value through innovation and customer relationships. Second, the obtained association between employee satisfaction and corporate performance implies that employees' online reviews are good predictors of a firm's financial results and, consequently, of value–relevance for investors. Hence, we provide additional empirical support to those arguing that due to the failure of standard accounting measures to capture investments in intangibles, non–financial indicators, such as employee satisfaction, are of key importance for security valuation (e.g., Amir and Lev, 1996). Third, the portfolio analysis indicates that employee satisfaction is not fully valued by investors in the equity markets as a trading strategy based on investing in firms characterised by high levels of employee satisfaction achieves statistically and economically significant abnormal returns. Therefore, we provide further evidence that intangibles are not fully priced in the

stock market and, most importantly, that this is not due to lack of information (e.g., Edmans, 2011), since we measure employee satisfaction on the basis of freely available online reviews.

Employee satisfaction and its value–relevance for both existing and potential shareholders is an issue that has attracted considerable attention in the literature (e.g., Edmans, 2011; Filbeck and Preece, 2003). Relevant empirical research is commonly based on Fortune's '100 Best Companies to Work for in America' list, compiled annually following the results of an employee survey for US firms with more than 1,000 employees that have been certified for a fee by the Great Place to Work® Institute. We differentiate from these studies and extend the literature by performing our analysis on the basis of employees' online reviews. This allows us to overcome a number of inherent limitations that Fortune's list has. For example, results based on that list may be driven by self–selection bias, since only firms that have (or believe to have) high levels of employee satisfaction have an incentive to pay a fee, get certified and participate in the survey. Moreover, as the Fortune's list includes the top 100 firms and is published every January, an analysis can be performed for a limited firm sample and only at an annual frequency. Finally, we should note that employees' online reviews have also been used for examining the relationship between employee satisfaction and corporate performance in Huang et al. (2015). In contrast to our study, however, the authors focus on family firms, do not perform a portfolio analysis or account for review volume.

2. Empirical analysis

2.1. Data

We obtain from Glassdoor all available employee reviews for US public firms over the period from 2009 to 2016. Our focus is on the overall satisfaction rating reported on a 5–point Likert scale, and only on reviews posted from current employees so that the results are not driven by disgruntled former employees. For robustness, we also disregard firms with less than 500 reviews during the period under scrutiny. Our final online review sample consists of 326,037 employee ratings for 313 firms. For our analysis, we also collect quarterly financial data from Thomson Reuters Datastream.

2.2. Corporate performance analysis

The baseline model (M1) for examining the relationship between employee satisfaction and corporate performance is the following:

$$Firm\ performance_{it} = \alpha + \beta Employee\ rating_{it-1} + \gamma' x_{it-1} + \varepsilon_{it} \tag{1}$$

where indices i and t correspond to firm and quarter, respectively. As a measure of firm performance, we use ROA and Tobin's q. $Employee\ rating_{it-1}$ is the quarter employee satisfaction rating computed by averaging all available ratings for each firm in each quarter. The vector x_{it-1} contains firm specific characteristics while, ε_{it} is the firm–quarter specific error term, adjusted for heteroscedasticity and serial correlation. For robustness, we also control for industry fixed–effects (M2), industry and time fixed–effects (M3), industry/time fixed–effects and lagged financial performance (M4). Finally, to account for the information included in the volume of the reviews, we repeat the analysis on a subset of firms with the highest ratio of reviews to employees (top 25%). All estimation results are presented in Table 1. These indicate a statistically significant positive relationship between employee satisfaction rating and corporate performance, with the exception of M4 for Tobin's q.

[Table 1 about here]

2.3. Portfolio analysis

We supplement the regression analysis by assessing the performance of stock portfolios for firms characterised by high levels of employee satisfaction. This allows us to examine on the one hand, the effect of employee satisfaction on firm value and on the other hand, whether employee satisfaction is priced in the stock market. To this end, we construct two value–weighted (V1, V2) and two equally–weighted (E1, E2) portfolios. V1 and E1 include the stocks of firms with a monthly employee satisfaction rating, that is, average of all available reviews for a firm in each month, at the 75th percentile. V2 and E2 are bivariate portfolios that account for both review rating and volume: the firms are initially ranked on the basis of the ratio of reviews to employees, and only the stock of those with the highest ratio (top 25%) are considered for inclusion in the portfolios, depending, as previously, on whether the

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average monthly satisfaction rating is at the 75th percentile. The portfolios are re–balanced every month. To account for risk, we assess portfolio performance by employing Carhart's four–factor model:

$$R_{it} = \alpha + \beta_{MKT} \cdot MKT_t + \beta_{HML} \cdot HML_t + \beta_{SMB} \cdot SMB_t + \beta_{MOM} \cdot MOM_t + \varepsilon_{it} \qquad (2)$$

where R_{it} is the monthly return on portfolio i in excess of the risk–free rate, obtained from Ibbotson Associates. The intercept α captures the abnormal risk–adjusted return while, MKT_t, HML_t, SMB_t and MOM_t are the returns on the market, value, size and momentum factors, taken from Ken French's website. ε_{it} is the error term, assumed to be heteroskedastic and serially correlated. For robustness, we repeat the analysis using Fama–French's three–factor model ($\beta_{MOM} = 0$ in (2)) and the CAPM ($\beta_{HML} = \beta_{SMB} = \beta_{MOM} = 0$ in (2)). The portfolio analysis results are presented in Table 2. In all cases, the portfolios achieve statistically and economically significant abnormal returns as indicated by the obtained alphas.[1]

[Table 2 about here]

3. Conclusion

We use employees' online reviews to examine the relationship between employee satisfaction and long–run equity returns. Consistent with human capital–centred theories of the firm, we find a statistically significant positive association between employee satisfaction and corporate performance. This intangible is not fully valued in the stock market, however, as a trading strategy based on investing in firms with high levels of employee satisfaction achieves statistically and economically significant abnormal returns. These are more pronounced when review volume is taken under consideration when constructing the portfolio.

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[1] Following the suggestion from a referee, we also assessed the performance of the four portfolios by using Fama–French's five–factor model. All portfolios achieve again statistically significant abnormal returns of comparable magnitude to those obtained when using Carhart's four–factor model. The results are available upon request.

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Table 1. Corporate performance analysis results

	All firms				Firms with a ratio of reviews to employees at the 75th percentile			
	(M1)	(M2)	(M3)	(M4)	(M1)	(M2)	(M3)	(M4)
Panel A: ROA								
Employee rating$_{t-1}$	0.0027***	0.0026***	0.0031***	0.0022***	0.0054***	0.0056***	0.0064***	0.0049***
Leverage$_{t-1}$	−0.0036	−0.0037	−0.0031	−0.0009	0.0029	0.0030	0.0039	0.0041
log(Total assets)$_{t-1}$	0.0000	0.0004	0.0004	0.0001	−0.0014	−0.0007	−0.0008	−0.0009
Dividend yield$_{t-1}$	0.0006	0.0004	0.0004	0.0003	0.0011*	0.0012*	0.0013**	0.0009*
Sales growth$_{t-1}$	0.0091***	0.0092***	0.0090***	0.0051	0.0107**	0.0108**	0.0108**	0.0067
Capital intensity$_{t-1}$	−0.0009***	−0.0008***	−0.0008***	−0.0005**	−0.0006**	−0.0006**	−0.0005**	−0.0002
R&D intensity$_{t-1}$	−0.0167	−0.0211	−0.0194	−0.0110	0.0106	0.0121	0.0137	0.0177
R&D expenditure dummy$_{t-1}$	0.0027	0.0025	0.0017	0.0011	0.0009	0.0010	−0.0008	−0.0017
log(Firm age)$_{t-1}$	0.0006	−0.0001	0.0000	−0.0002	0.0014	0.0013	0.0015	0.0010
Capital expenditure ratio$_{t-1}$	−0.0002	−0.0004	−0.0004	−0.0005	0.0002	0.0002	0.0000	−0.0005
log(Employees)$_{t-1}$	0.0009	0.0005	0.0005	0.0004	0.0033*	0.0025	0.0031	0.0027*
ROA$_{t-1}$				0.2652***				0.2441***
Constant	−0.0007	−0.0055	−0.0084	−0.0027	−0.0179	−0.0329	−0.0380*	−0.0254
Industry fixed–effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Time fixed–effects	No	No	Yes	Yes	No	No	Yes	Yes
Adjusted R^2	0.0331	0.0381	0.0398	0.1118	0.0610	0.0616	0.0681	0.1476
Panel B: Tobin's q								
Employee rating$_{t-1}$	1.3103***	1.2511***	1.2086***	0.0463	3.3416***	3.1440***	3.2581***	0.0380
Leverage$_{t-1}$	−5.0964***	−5.0423***	−5.0699***	−0.2239**	−4.8759**	−4.8868**	−4.7717**	−0.0895
log(Total assets)$_{t-1}$	−0.4863	−0.3618	−0.3710	−0.0170	−1.1817	−1.1938	−1.1979	0.0196
Dividend yield$_{t-1}$	−0.0550	−0.0840	−0.0779	−0.0075	−0.1103	−0.0756	−0.0627	0.0221
Sales growth$_{t-1}$	0.2603	0.1389	0.1155	0.2598***	0.2795	0.1006	0.0860	0.2443***
Capital intensity$_{t-1}$	−0.1150**	−0.1436***	−0.1453***	−0.0072	−0.1626*	−0.1986**	−0.1948**	−0.0207**
R&D intensity$_{t-1}$	12.8828**	11.6789**	11.4938**	−0.0839	23.7095**	21.7362**	22.2063**	0.7623
R&D expenditure dummy$_{t-1}$	0.3732	0.3562	0.4939	0.0581	0.5776	1.2360	1.1028	0.0788
log(Firm age)$_{t-1}$	−1.1948***	−1.3017***	−1.3084***	−0.0712**	−1.9946**	−1.9284**	−1.9700**	−0.1258*
Capital expenditure ratio$_{t-1}$	0.0309	0.0873	0.0854	−0.0078	0.1692	0.3683	0.3256	0.0356
log(Employees)$_{t-1}$	−0.1413	−0.2209	−0.2072	−0.0124	0.4021	0.4876	0.5610	0.0391
Tobin's q$_{t-1}$				0.9311***				0.9129***
Constant	15.6714***	14.2199***	13.7710***	0.9760**	17.0123	14.6582	11.9587	0.4647
Industry fixed–effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Time fixed–effects	No	No	Yes	Yes	No	No	Yes	Yes
Adjusted R^2	0.1752	0.1851	0.1872	0.9154	0.1878	0.1968	0.1998	0.8992

Note: *, **, *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 2. Portfolio analysis results

	Value–weighted		Equally–weighted	
	(V1)	(V2)	(E1)	(E2)
Panel A: CAPM				
a	0.0156^{**}	0.0171^{**}	0.0163^{***}	0.0177^{***}
β_{MKT}	−0.0016	−0.0009	−0.0017	−0.0005
Panel B: Fama–*French's* Three–factor Model				
a	0.0141^{**}	0.0167^{**}	0.0149^{***}	0.0180^{***}
β_{MKT}	−0.0008	−0.0010	−0.0008	−0.0012
β_{HML}	0.0001	0.0018	0.0001	0.0028
β_{SMB}	−0.0032	−0.0011	−0.0031	0.0005
Panel C: *Carhart's Four*–factor Model				
a	0.0135^{**}	0.0160^{**}	0.0143^{***}	0.0174^{***}
β_{MKT}	−0.0013	−0.0016	−0.0014	−0.0018
β_{HML}	0.0001	0.0018	0.0001	0.0029
β_{SMB}	−0.0046	−0.0027	−0.0047	−0.0012
β_{MOM}	-0.0022^{**}	-0.0024^{***}	-0.0023^{**}	-0.0026^{***}
Panel D: Portfolio Performance				
Mean return	0.0136	0.0174	0.0143	0.0186
St. Dev.	4.9049	6.5460	4.8433	6.2605

Note: *, **, *** denote statistical significance at the 10%, 5% and 1% level, respectively.