

Crowdsourced Employer Reviews and Stock Returns

Internet Appendix

T. Clifton Green[†] Ruoyan Huang[‡] Quan Wen[§] Dexin Zhou[¶]

This appendix consists of two parts: Section IA.1 considers a text-based measure of employee satisfaction, and Section IA.2 investigates the role of labor productivity and changes in the workforce on the association between employer ratings and stock returns. Additional tables referred in our main texts and in Sections IA.1 and IA.2 are attached after these two sections.

IA.1 Text-based employer ratings and stock returns

Our primary measure for gauging employee satisfaction relies on one to five star overall ratings. Glassdoor also provides employees with an opportunity to contribute text responses that characterize the pros and cons of their employer, and in this section we consider an alternative text-based measure of employee satisfaction. We conjecture that if employees generally have strong positive opinions regarding their employer, they are likely to submit lengthy discussions in the pros section and may write relatively few words in the cons section. On the other hand, if employees are more negatively inclined toward their employer, the cons discussion will likely be lengthier than the pros sections. We therefore define the text-based employer rating ($Rating^{text}$) as the difference between the number of words in the pros and cons sections of employee reviews, scaled by the total number of words in both sections. We require review words to be listed in Loughran and McDonald's (2011) master dictionary

[†] Goizueta Business School, Emory University, email: clifton.green@emory.edu

[‡] Moody's Analytics, email: huang@moodys.com

[§] McDonough School of Business, Georgetown University, email: quan.wen@georgetown.edu

[¶] Zicklin School of Business, Baruch College, email: dexin.zhou@baruch.cuny.edu

and we exclude words from their stop word list which contains names, number, locations, etc.¹⁶

Across the approximately one million review sample (described in Table 1), employees use 26.04 words on average in the pros section of their ratings and 38.97 words in the cons sections. The average (median) $Rating^{text}$ across the one million review samples (as described in Table 1) is -0.03 (0.00), which indicates a relatively even treatment of pros and cons. However, there is considerable variation. The standard deviation is 0.41 and the 25th and 75th percentiles are -0.33 and 0.25, respectively. The correlation between overall star $Rating$ and $Rating^{text}$ is 0.49. Regarding the subcategories, $Rating^{text}$ is least correlated with *Compensation & Benefits* (0.31) and most closely correlated with *Senior Management* and *Culture & Values* (both at 0.45).

We infer shifts in employee satisfaction by calculating changes in text-based ratings, $\Delta Rating^{text}$, defined as the average text-based employer rating in quarter t minus the average rating in quarter $t-1$, and we require 15 reviews in each quarter (the correlation between $\Delta Rating$ and $\Delta Rating^{text}$ is at 0.51). We then repeat the portfolio sorts described in the previous section, forming three portfolios each quarter based on the bottom quintile, middle three quintiles, and top quintile breakpoints for $\Delta Rating^{text}$. Table IA.6 reports equal- and value-weighted portfolio returns and Fama-French-Carhart four-factor alphas.

The evidence in Table IA.6 indicates that changes in text-based employer ratings lead to a similar return dispersion as the overall star ratings. The high $\Delta Rating^{text}$ portfolio outperforms the low $\Delta Rating^{text}$ portfolio by 0.55% per month (with a t -statistic of 2.26), and the Fama-French-Carhart four-factor alpha for the long-short portfolio is 0.62% (t -stat. = 2.57). The value-weighted portfolio results are similar though slightly weaker. The long-short portfolio produces a four-factor alpha of 0.43% that is statistically different from zero at the 5% level.

¹⁶ The median Textual Rating is -0.10, indicating a slight tendency towards responses in the pros sections of the review than in the cons.

In untabulated results, we also consider a revised measure of text-based ratings by excluding words reflecting emotional expressiveness (from the Harvard IV-4 General Inquirer dictionary), with the idea being that emotion words may reflect idiosyncratic employee experiences rather than general firm performance. The results remain similar. For the equal-weighted portfolio, the high $\Delta Rating^{text}$ portfolio outperforms the low $\Delta Rating^{text}$ portfolio by 0.59% per month (with a t -statistic of 2.54), and the Fama-French-Carhart four-factor alpha for the long-short portfolio is 0.50% (t -stat. = 2.42). The value-weighted portfolios results are similar, with a four-factor alpha for the long-short portfolio of 0.45% per month (t -stat. = 2.22).

IA.2 Labor Intensity and Changes to the Workforce

We measure labor intensity as in Agrawal and Matsa (2013) using labor costs scaled by net sales.¹⁷ Panel A of Table IA.10 reports the average labor intensity among the 12 Fama-French 12 industries as a validity check. Consistent with our intuition about the importance of labor for firm productivity across industries, the three industries with the highest labor intensity are Healthcare (0.67), Retail Services (0.43), and Business Equipment (0.36), whereas the three industries with the lowest labor intensity are Consumer Durables (0.17), Chemicals (0.14), and Utilities (0.13).

In Panel B of Table IA.10, we sort firms into two groups based on the median level of labor in the portfolio formation month, and repeat the return analysis as in Table 6. We find no evidence that the association between employer ratings changes and stock returns is stronger among firms with greater labor intensity. In particular, the equal-weighted and value-weighted portfolio evidence is consistent with reviews being more informative among firms with low labor share. For equal-weighted portfolios, the four-factor alpha for the long-short $\Delta Rating$ portfolio is 0.72% per month for stocks with low labor share and 0.35% for

¹⁷ Labor costs are measured using XLR in Compustat (Staff Expense: Total), which includes salaries, wages, pension costs, profit sharing and incentive compensation, payroll taxes and other employee benefits. Sales are measured using SALE. For the missing values of firm-level XLR, we use the Fama-French 12-industry classifications to compute the average industry compensation using firms with non-missing XLR.

stocks with high labor share. The value-weighted portfolio evidence is similar, with a statistically significant four-factor alpha of 0.54% for stocks with low labor share and insignificant alpha of 0.24% for stocks with high labor share.

Our measure of labor intensity relies on staff expense information in Compustat (XLR), which tends to be sparsely populated in the data. Moreover, John, Knyazeva, and Knyazeva (2015) argue that industry-level metrics are more exogenous than firm-level measures, as firms may adjust their use of labor inputs in response to state labor laws. In Panel C, we therefore follow John, Knyazeva, and Knyazeva (2015) and proxy for labor intensity using the ratio of industry compensation expense to industry output based on the Bureau of Economic Analysis (BEA) Industry Accounts data. Panel C of Table IA.10 shows again that the equal-weighted and value-weighted portfolio evidence is consistent with reviews being more informative among firms with low labor intensity. The four-factor alphas are in the range of 0.74% to 1.10% per month for stocks with low labor share, but are insignificant for stocks with high labor share. Overall, the evidence in Table IA.10 is inconsistent with the interpretation that the relation between ratings changes and returns is primarily driven by a causal relation between employee satisfaction and firm performance.

We next consider whether the relation between employer rating changes and stock returns is sensitive to changes in the firm's workforce. If the rating-return association represents a causal effect of morale on performance, then newly hired employees could potentially influence firm performance as much as long-time workers. On the other hand, we might expect newly hired employees to be less informed about firm conditions than existing employees and generally bullish on the firm, which could weaken the ratings-return relation. Firm layoffs may also temper the relation between ratings changes and stock returns. For example, employer ratings likely suffer following layoffs while firm conditions could potentially improve. In this case, employer ratings changes may predict returns less successfully following firm layoffs, and excluding layoff firms may improve the predictability of employer rating downgrades.

We explore these hypotheses by replicating the return analysis in Table 3 after excluding firms that have recently experienced significant changes in their workforce. First, we exclude firms that have increased their number of employees by more than 10% during the most recent fiscal year. The evidence, tabulated in Table IA.11 in the internet appendix, supports a stronger relation between ratings changes and returns. For example, the four-factor alpha for the value-weighted long-short Δ Rating portfolio is 1.01% (and statistically significant at the 1 percent level) compared to 0.77% in Table 3, consistent with new employees being less informed about firm conditions. We next repeat the analysis after instead excluding firms that experience layoffs of more than 10% of the number of employees.¹⁸ The results after excluding layoffs are similar but slightly weaker to those in Table 3 (e.g. 0.67% for the value-weighted long-short portfolio, significant at the 5 percent level), suggesting ratings changes among layoff firms remain informative.

¹⁸ We ensure that reductions in the labor force represent layoffs rather than sales or other divestitures through newswire searches. In particular, we searched Factiva for the company name during the fiscal year of the reduction and the following terms: “job cuts” or “cut jobs” or “layoff” or “layoffs” or “lay off” or “cut workforce” or “workforce cuts.”

References

- Agrawal, A., and Matsa, D., 2013. Labor unemployment risk and corporate financing decisions. *Journal of Financial Economics* 108, 449-470.
- Loughran, T., and McDonald, B., 2011, When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *Journal of Finance* 66, 35-65.
- John, K., Knyazeva A., and Knyazeva A. Employee rights and acquisitions. *Journal of Financial Economics* 118, 49-69.

Table IA 1. Employer Reviews Industry Distribution

This table reports the industry distribution of sample firms based on the Fama-French 30 Industry Classification.

FFNUM	Industry Description	# of Firms	% of Firms	# of Reviews	% of Reviews
1	Food Products	40	3.23%	11,013	2.54%
2	Beer & Liquor	9	0.73%	420	0.10%
3	Tobacco Products	3	0.24%	709	0.16%
4	Recreation	27	2.18%	6,091	1.41%
5	Printing and Publishing	15	1.21%	2,471	0.57%
6	Consumer Goods	17	1.37%	2,005	0.46%
7	Apparel	13	1.05%	4,947	1.14%
8	Healthcare, Medical Equipment, Pharmaceutical Products	134	10.82%	20,407	4.71%
9	Chemicals	42	3.39%	4,828	1.11%
10	Textiles	9	0.73%	279	0.06%
11	Construction and Construction Materials	41	3.31%	3,339	0.77%
12	Steel Works, Etc.	26	2.10%	2,065	0.48%
13	Fabricated Products and Machinery	62	5.01%	8,095	1.87%
14	Electrical Equipment	28	2.26%	1,804	0.42%
15	Automobiles and Trucks	17	1.37%	2,020	0.47%
16	Aircraft ships and railroad equipment	15	1.21%	2,115	0.49%
17	Precious Metals Non-Metallic and Industrial Metal Mining	7	0.57%	432	0.10%
18	Coal	2	0.16%	176	0.04%
19	Petroleum and Natural Gas	45	3.63%	4,675	1.08%
20	Utilities	55	4.44%	5,005	1.16%
21	Communication	32	2.58%	32,455	7.49%
22	Personal and Business Services	187	15.11%	68,108	15.72%
23	Business Equipment	183	14.78%	48,982	11.31%
24	Business Supplies and Shipping Containers	23	1.86%	2,524	0.58%
25	Transportation	34	2.75%	8,192	1.89%
26	Wholesale	61	4.93%	8,019	1.85%
27	Retail	81	6.54%	156,948	36.22%
28	Restaurants, Hotels, Motels	23	1.86%	23,296	5.38%
30	Everything Else	7	0.57%	1,839	0.42%

Table IA 2. Glassdoor Ratings and Other Measures of Employee Satisfaction

The table reports the results from a panel regression of Glassdoor employer ratings on alternative measures of employee satisfaction. Glassdoor employer reviews are measured quarterly using the average overall rating (with a minimum of fifteen reviews each quarter). In Specifications 1 and 2, we consider KLD employer ratings which are measured as the number of employee strengths less the number of employee weaknesses. The KLD sample covers 2008-2013 and the regressions are run on observations for which Glassdoor and KLD ratings are available. In Specifications 3 and 4, we examine a dummy variable for Fortune's Top 100 places to work that is 1 if the firm is among the 100 top places to work that year and 0 otherwise. The Fortune sample covers 2008-2016. Time-clustered t -statistics are reported in parentheses. *, **, and ***, indicate significance of the difference in returns and alphas at the 10%, 5%, and 1% levels, respectively.

	KLD Employer		Fortune 100	
	Strengths – Weaknesses		Best Places to Work	
	(1)	(2)	(3)	(4)
KLDRATING	0.057*** (15.25)	-0.000 (-0.02)		
Top 100			0.499*** (50.77)	0.075** (2.56)
Book-to-Market	-0.019*** (-2.84)	0.005 (0.31)	-0.001 (-0.42)	0.002 (0.97)
Size	0.068*** (6.96)	0.025 (1.34)	0.085*** (18.10)	0.010 (1.03)
ROA	0.040*** (3.14)	-0.001 (-0.04)	0.037*** (5.69)	0.017*** (2.93)
Forecast Dispersion	0.000 (0.08)	0.001 (0.36)	0.007 (0.99)	-0.005 (-1.49)
Turnover	0.015 (1.10)	-0.040*** (-3.51)	0.016** (2.08)	-0.022** (-2.64)
ILLIQ	0.019 (1.48)	0.010 (0.72)	-0.007*** (-3.46)	-0.010*** (-3.21)
Idiosyncratic Volatility	-0.016* (-1.93)	-0.013 (-1.59)	-0.053*** (-5.82)	-0.004 (-0.72)
Institutional Ownership	-0.026* (-1.98)	0.000 (0.01)	-0.040*** (-4.19)	0.012** (2.62)
Return _{$t-1:t-3$}	0.004 (0.43)	0.000 (0.02)	0.010 (1.38)	0.003 (1.01)
Return _{$t-4:t-6$}	0.020* (1.87)	0.009 (1.26)	0.018** (2.44)	0.009** (2.45)
FE	Time	Time, Firm	Time	Time, Firm
Observations	4,095	3,958	16,436	16,242
R-squared	0.100	0.662	0.094	0.649

Table IA 3. Returns for Portfolios Sorted on Changes in Employer Ratings: Alternative Minimum Number of Ratings

We form three portfolios at the end of each quarter from September 2008 to June 2016 by sorting stocks based on quarterly changes in employer ratings (ΔRating), defined as the average employee rating in quarter t minus the average rating in quarter $t-1$. The breakpoints for partitioning the groups are based on the bottom 20%, the middle 60%, and the top 20% change in ratings. Low ΔRating denotes the lowest ΔRating (reductions in employee satisfaction) and High ΔRating denotes the highest (improvements in satisfaction). Each stock remains in the portfolio for three months. Portfolio results are reported using equal- and value-weighted portfolio weights, and the table reports the average monthly raw return and the Fama-French-Carhart (FFC) 4-factor alpha in monthly percentage terms. The last row reports the differences in monthly average returns and alphas. Newey-West adjusted t -statistics are given in parentheses. *, **, and ***, indicate significance of the difference in returns and alphas at the 10%, 5%, and 1% levels, respectively. In Panel A (B), a minimum of 10 (20) employer reviews are required in quarters $t-1$ and t .

Panel A: Minimum of 10 Employer Reviews Each Quarter

	Equal-Weighted Portfolios		Value-Weighted Portfolios	
	Average Return	4-Factor Alpha	Average Return	4-Factor Alpha
Low ΔRating	0.92 (1.35)	-0.17 (-0.87)	0.53 (0.99)	-0.39** (-2.18)
Middle Group	1.20* (1.93)	0.11 (0.83)	0.95* (1.91)	0.06 (0.74)
High ΔRating	1.54** (2.38)	0.54** (2.55)	1.24** (2.38)	0.29* (1.78)
High – Low	0.62** (2.45)	0.71** (2.40)	0.71*** (3.22)	0.67*** (3.12)

Panel B: Minimum of 20 Employer Reviews Each Quarter

	Equal-Weighted Portfolios		Value-Weighted Portfolios	
	Average Return	4-Factor Alpha	Average Return	4-Factor Alpha
Low ΔRating	1.02** (2.22)	-0.02 (-0.12)	0.59 (1.20)	-0.38 (-1.52)
Middle Group	1.14*** (2.67)	0.08 (0.57)	0.95*** (2.73)	0.09 (0.83)
High ΔRating	1.27*** (2.63)	0.23 (1.40)	1.16*** (3.07)	0.26 (1.39)
High – Low	0.25 (1.22)	0.25 (1.07)	0.57* (1.93)	0.64** (2.01)

Table IA 4. Portfolios Sorted on Employer Rating Changes: Alternative Risk Models

We form three groups of portfolios at the end of every quarter from September 2008 to June 2016 by sorting stocks based on quarterly changes in employer ratings (ΔRating), defined as the average employer rating in quarter t minus the average rating in quarter $t-1$. The breakpoints for partitioning the groups are based on the bottom 20%, the middle 60%, and the top 20% change in ratings. Low ΔRating denotes the lowest ΔRating (reductions in employee satisfaction) and High ΔRating denotes the highest (improvements in satisfaction). Each stock remains in the portfolio for three months, and results are reported for equal-weighted portfolios in Panel A and value-weighted portfolios in Panel B. Abnormal performance (alpha) is measured relative to the Fama-French 3-factor model, the Fama-French-Carhart-Pastor-Stambaugh (FFCPS) 5-factor alpha, and the Fama-French (2015) 5-factor model. Alphas are presented in monthly percentage terms. Panel C reports results using the Daniel, Grinblatt, Titman, and Wermers (DGTW, 1997) characteristic-based benchmarks, as well as the industry-adjusted returns based on the Fama-French 30 industries defined in Table IA.1. The last row reports the differences in monthly alphas. Newey-West adjusted t -statistics are given in parentheses. *, **, and ***, indicate significance of the difference in returns and alphas at the 10%, 5%, and 1% levels, respectively.

Panel A: Equal-Weighted Portfolios

	FF 3-Factor Alpha	FFCPS 5-Factor Alpha	FF 5-factor Alpha
Low ΔRating	-0.22 (-1.04)	-0.29 (-1.22)	-0.19 (-0.90)
Middle Group	0.03 (0.19)	0.00 (0.00)	0.06 (0.34)
High ΔRating	0.69** (2.33)	0.71*** (2.89)	0.73** (2.47)
High – Low	0.91*** (2.67)	1.00*** (3.09)	0.92*** (2.83)

Panel B: Value-Weighted Portfolios

	FF 3-Factor Alpha	FFCPS 5-Factor Alpha	FF 5-factor Alpha
Low ΔRating	-0.37** (-2.03)	-0.46** (-2.06)	-0.41** (-2.40)
Middle Group	0.01 (0.12)	0.01 (0.11)	0.04 (0.31)
High ΔRating	0.43* (1.70)	0.46** (2.01)	0.37 (1.52)
High – Low	0.79*** (3.03)	0.92*** (3.52)	0.78*** (3.05)

Table IA 4. Portfolios Sorted on Employer Rating Changes: Alternative Risk Models
(continued)

Panel C: DGTW- and industry-adjusted returns

	Equal-Weighted Portfolios		Value-Weighted Portfolios	
	DGTW-Adj	Industry-Adj	DGTW-Adj	Industry-Adj
	Return	Return	Return	Return
Low Δ Rating	-0.29 (-1.52)	-0.70*** (-3.33)	-0.31* (-1.71)	-0.55*** (-3.79)
Middle Group	-0.03 (-0.24)	-0.45*** (-3.22)	-0.02 (-0.18)	-0.48*** (-2.54)
High Δ Rating	0.32** (2.05)	0.08 (0.26)	0.24 (1.32)	0.12 (0.35)
High – Low	0.61** (2.53)	0.78** (2.62)	0.55*** (2.85)	0.67*** (2.80)

Table IA 5. Returns for Stock Portfolios Sorted on Employer Ratings: Rating Levels

We form three portfolios at the end of each quarter from September 2008 to June 2016 by sorting stocks based on employee ratings (Rating), defined as the average employee rating in quarter t . The breakpoints for partitioning the groups are based on the bottom 20%, the middle 60%, and the top 20% rating. Low Δ Rating denotes the lowest Rating (least satisfied employees) and High Δ Rating Each stock remains in the portfolio for three months. Portfolio results are reported using equal- and value-weighted portfolio weights. Panel A reports the average monthly raw return and the Fama-French-Carhart (FFC) 4-factor alpha. Average returns and alphas are presented in monthly percentage terms. The last row reports the differences in monthly average returns and alphas. Panel B reports the average portfolio characteristics which are defined in the appendix. Newey-West adjusted t -statistics are given in parentheses. *, **, and ***, indicate significance of the difference in returns and alphas at the 10%, 5%, and 1% levels, respectively.

Panel A: Future Portfolio Returns Sorted by Employer Rating

	Equal-Weighted Portfolios		Value-Weighted Portfolios	
	Average Return	4-Factor Alpha	Average Return	4-Factor Alpha
Low Rating	0.97*** (2.85)	-0.02 (-0.13)	0.83* (1.88)	0.02 (0.07)
Middle Group	1.12*** (3.17)	0.04 (0.49)	0.88* (1.71)	0.01 (0.11)
High Rating	1.28*** (4.11)	0.26* (1.69)	1.04** (2.05)	0.13 (0.54)
High – Low	0.31* (1.92)	0.28 (1.62)	0.21 (0.68)	0.11 (0.27)

Table IA 6. Portfolio Returns and Changes in Employer Ratings: Text-Based Measures

We form three portfolios at the end of each quarter from September 2008 to June 2016 by sorting stocks based on quarterly changes in text-based employer ratings, defined as the average textual rating in quarter t minus the average rating in quarter $t-1$. We construct firm-level textual ratings as the difference between the number of words in the pros and cons sections of the review, scaled by the total number of words in both sections. Low Δ Rating denotes the portfolio experiencing the lowest change in rating (reductions in employee satisfaction) and High Δ Rating denotes the highest (improvements in satisfaction). Each stock remains in the portfolio for the next three months. Portfolio results are reported using equal- and value-weighted portfolio weights. Performance is measured using the average monthly raw return and the Fama-French-Carhart (FFC) 4-factor alpha. Average returns and alphas are presented in monthly percentage terms. The last row reports the differences in monthly average returns and alphas. Newey-West adjusted t -statistics are given in parentheses. *, **, and ***, indicate significance of the difference in returns and alphas at the 10%, 5%, and 1% levels, respectively.

	Equal-Weighted Portfolios		Value-Weighted Portfolios	
	Average Return	4-Factor Alpha	Average Return	4-Factor Alpha
Low Δ Rating	0.84* (1.81)	-0.30 (-1.55)	0.80* (1.86)	-0.08 (-0.66)
Middle Group	1.19*** (2.79)	0.14 (1.33)	0.96*** (2.68)	0.06 (1.04)
High Δ Rating	1.39*** (2.69)	0.32 (1.44)	1.31*** (3.28)	0.35 (1.44)
High – Low	0.55** (2.26)	0.62*** (2.57)	0.51*** (2.62)	0.43** (2.17)

Table IA 7. Orthogonalized Changes in Employer Ratings and Stock Returns: Fama-MacBeth Regressions

This table reports the average intercept and slope coefficients from the Fama and MacBeth (1973) cross-sectional regressions of one-month-ahead excess stock returns on the orthogonalized changes in employer ratings ($\Delta\text{Rating}^{\text{Orthogonal}}$), defined as the residual from regressing the average employer ratings in quarter t minus the average ratings in quarter $t-1$ with respect to the firm characteristics in Table 2. The independent variables are defined in the appendix and include size, book-to-market, stock returns, the Amihud illiquidity measure, ROA, asset growth, idiosyncratic volatility, analyst forecast dispersion, analyst recommendation changes, and insider trading. $\Delta\text{Rating}^{\text{Orthogonal}}$ and Rating are z-scored (demeaned and divided by their standard deviation) within each month. Newey-West adjusted t -statistics are given in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The sample covers June 2008 to June 2016.

	(1)	(2)	(3)
$\Delta\text{Rating}^{\text{Orthogonal}}$	0.241** (2.48)	0.209** (2.28)	0.215** (2.25)
Rating		0.179 (1.53)	0.184* (1.79)
Size		-0.103 (-0.98)	0.057 -0.65
Book-to-Market		-0.188 (-0.83)	-0.132 (-0.23)
Return _{t-12:t-2}		-0.008 (-0.61)	0.006 -0.58
Illiquidity			0.172 (0.99)
Return _{t-1}			-0.018 (-0.85)
ROA			0.892 (1.39)
Asset Growth			-0.345 (-0.75)
Idiosyncratic Volatility			-0.656 (-1.73)
Forecast Dispersion			-0.402* (-1.87)
$\Delta\text{Recommendation}$			0.237 (0.40)
Insider Trading			0.405
# of time periods	93	93	93
Obs. per period	244	244	244
Adj. R-squared	0.01	0.03	0.07

Table IA 8. The Information Content in Changes in Employer Rating versus Changes in Business Outlook

This table reports the average intercept and slope coefficients from the Fama and MacBeth (1973) cross-sectional regressions of one-month-ahead excess stock returns on the orthogonalized changes in business outlook with respect to changes in employer rating ($\Delta\text{Outlook}^{\text{Orthogonal}}$) and vice versa ($\Delta\text{Rating}^{\text{Orthogonal}}$). The four key independent variables are z-scored (demeaned and divided by their standard deviation) within each month. *SSDX*, *Size*, *BM*, and *Illiquidity* are Newey-West adjusted *t*-statistics are given in parentheses, where *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The sample covers March 2013 to June 2016.

	Changes in Business Outlook			Changes in Employer Rating	
	(1)	(2)		(1)	(2)
$\Delta\text{Outlook}$	0.161*		ΔRating	0.220**	
	(1.85)			(2.33)	
$\Delta\text{Outlook}^{\text{Orthogonal}}$		0.017	$\Delta\text{Rating}^{\text{Orthogonal}}$		0.213**
		(0.11)			(2.12)
Rating	0.226**	0.163**	Rating	0.202**	0.209*
	(2.29)	(2.26)		(2.17)	(1.83)
Size	-0.579	0.061	Size	-0.345	-0.124
	(-1.09)	(0.69)		(-1.07)	(-1.25)
Book-to-Market	0.284	0.011	Book-to-Market	0.160	-0.225
	(0.24)	(0.07)		(0.85)	(-0.36)
$\text{Return}_{t-12:t-2}$	-0.020	0.065	$\text{Return}_{t-12:t-2}$	0.007	0.010
	(-1.47)	(0.89)		(0.78)	(1.01)
Illiquidity	-0.016	0.172	Illiquidity	0.122	0.037
	(-1.23)	(0.99)		(0.86)	(1.18)
Return_{t-1}	-0.007	-0.015	Return_{t-1}	-0.017*	-0.063
	(-0.47)	(-0.75)		(-1.68)	(-1.35)
ROA	-1.013	-0.835	ROA	0.287	0.618
	(-1.16)	(-1.37)		(1.71)	(1.23)
Asset Growth	-0.702	-0.327	Asset Growth	-0.632	-0.646
	(-1.79)	(-0.74)		(-1.18)	(-1.10)
Idiosyncratic Volatility	-0.569**	-0.685	Idiosyncratic Volatility	-0.387	0.022
	(-3.02)	(-1.78)		(-1.32)	(0.07)
Forecast Dispersion	-0.542	-0.287	Forecast Dispersion	(0.15)	-0.417
	(-1.45)	(-0.59)		(-0.31)	(-1.03)
$\Delta\text{Recommendation}$	0.184	0.151	$\Delta\text{Recommendation}$	0.132	0.125
	(0.51)	(0.46)		(0.81)	(0.40)
Insider Trading	0.179	0.343	Insider Trading	0.124	0.396
	(0.83)	(1.43)		(0.17)	(0.41)
# of time periods	42	42	# of time periods	42	42
Obs. per period	162	162	Obs. per period	162	162
Adj. R-squared	0.05	0.03	Adj. R-squared	0.06	0.05

Table IA 9. Employer Ratings, Business Outlook, and Firm Operating Performance

This table reports the regression results of changes in operating performance on employer ratings and business outlook ratings. In Panel A, Sales growth is measured from quarter t to quarter $t+1$. In Panel B, Earnings surprises are measured using analyst forecast errors, defined as the difference between the realized earnings in quarter $t+1$ and the consensus analyst earnings forecast, scaled by the absolute value of the realized earnings. In Panel A, the key independent variables are the employer rating (Rating) and business outlook (Outlook), defined as the average employer rating and average business outlook in quarter t . We also consider business outlook after orthogonalizing with respect to employer rating (Outlook^{Orthogonal}) and vice versa (Rating^{Orthogonal}). In Panel B, we examine changes in employer rating (Δ Rating) and business outlook (Δ Outlook). We control for firm characteristics including size, book-to-market, and momentum which are defined in the appendix. Time-clustered t -statistics are reported in parentheses, with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively. The sample covers June 2008 to June 2016.

Panel A: Sales Growth

	Business Outlook		Employer Rating		
	(1)	(2)	(1)	(2)	
Outlook	0.016*** (7.87)		Rating	0.005* (2.04)	
Outlook ^{Orthogonal}		0.021*** (7.09)	Rating ^{Orthogonal}	-0.015*** (-4.89)	
Size	0.011*** (2.92)	0.011** (2.91)	Size	0.012** (2.98)	
Book-to-Market	-0.004 (-1.21)	-0.004 (-1.16)	Book-to-Market	-0.002 (-0.41)	
Return _{$t-12:t-2$}	0.010*** (3.79)	0.010*** (3.81)	Return _{$t-12:t-2$}	0.015*** (6.09)	
Illiquidity	0.001 (1.34)	0.001 (1.28)	Illiquidity	0.001 (1.04)	
Turnover	-0.000 (-0.08)	0.000 (0.02)	Turnover	-0.001 (-0.59)	
ROA	-0.001 (-0.99)	-0.001 (-1.02)	ROA	-0.001 (-1.23)	
Forecast Dispersion	-0.001 (-0.84)	-0.001 (-0.84)	Forecast Dispersion	-0.001 (-0.74)	
Idio. Volatility	-0.007** (-2.97)	-0.006** (-2.72)	Idio. Volatility	-0.008*** (-3.85)	
Inst. Ownership	-0.001 (-0.52)	-0.001 (-0.41)	Inst. Ownership	-0.001 (-0.39)	
Fixed Effects	Time,Firm	Time,Firm	Fixed Effects	Time,Firm	Time,Firm
Observations	6,308	6,308	Observations	6,548	6,548
R-Squared	0.575	0.576	R-Squared	0.533	0.572

Table IA 9. Employer Ratings, Business Outlook, and Firm Operating Performance
(continued)

Panel B: Earnings Surprises					
	Business Outlook			Employer Rating	
	(1)	(2)		(1)	(2)
Δ Outlook	0.028 (1.27)		Δ Rating	0.045** (2.31)	
Δ Outlook ^{Orthogonal}		-0.035 (-0.96)	Δ Rating ^{Orthogonal}		0.068* (2.15)
Size	0.218 (1.25)	0.218 (1.25)	Size	-0.090 (-0.68)	0.218 (1.25)
Book-to-Market	-0.396 (-0.95)	-0.398 (-0.95)	Book-to-Market	-0.302 (-1.01)	-0.399 (-0.96)
Return _{t-12:t-2}	-0.166*** (-4.57)	-0.167*** (-4.61)	Return _{t-12:t-2}	-0.121*** (-4.01)	-0.168*** (-4.63)
Illiquidity	1.546 (1.04)	1.561 (1.04)	Illiquidity	1.176 (1.24)	1.584 (1.07)
Turnover	-0.082 (-0.68)	-0.083 (-0.68)	Turnover	-0.024 (-0.34)	-0.082 (-0.68)
ROA	-0.018 (-1.58)	-0.016 (-1.41)	ROA	-0.006 (-0.66)	-0.019 (-1.51)
Forecast Dispersion	4.099*** (4.90)	4.100*** (4.91)	Forecast Dispersion	0.977 (1.35)	4.103*** (4.93)
Idio. Volatility	0.019 (0.36)	0.017 (0.33)	Idio. Volatility	-0.064 (-0.83)	0.014 (0.27)
Inst. Ownership	0.072* (2.17)	0.071* (2.12)	Inst. Ownership	0.086*** (2.78)	0.071* (2.15)
Fixed Effects	Time,Firm	Time,Firm	Fixed Effects	Time,Firm	Time,Firm
Observations	6,877	6,877	Observations	6,877	6,877
R-Squared	0.292	0.292	R-Squared	0.232	0.293

Table IA 10. Portfolios Sorted on Employer Rating Changes: Labor Intensity

The table reports the return performance of portfolio sorted by changes in employer rating (ΔRating), conditioning on labor intensity, defined as total staff expenses over net sales. ΔRating is defined as the average employer rating in quarter t minus the average ratings in quarter $t-1$. Each stock remains in the portfolio for three months, and portfolios are either equal- or value-weighted. The breakpoints for partitioning the rating change groups are based on the top and bottom 20% ratings, with High (Low) denoting improvements (reductions) in employee satisfaction. Panel A reports the average labor intensity in the Fama-French 12 industries. Panel B splits firms into two groups using median labor intensity at the end of the previous quarter. Panel C splits firms into two groups using an alternative measure of labor intensity proxied by the ratio of compensation expense to output based on the Bureau of Economic Analysis (BEA) Industry Accounts, following John, Knyazeva, and Knyazeva (2015). Panels B and C report differences in performance between the high and low change portfolios, using returns and alphas with respect to the Fama-French-Carhart (FFC) model. Newey-West adjusted t -statistics are given in parentheses, with *, **, *** indicating significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Average labor intensity (total staff expenses over net sales)

Industry Description	Labor Intensity	Industry Description	Labor Intensity
Utilities	0.13	NonDurables	0.20
Chemicals	0.14	Other	0.20
Durables	0.17	Finance	0.29
Energy, Oil, Gas	0.18	Business Equipment	0.36
Manufacturing	0.19	Retail Services	0.43
Telephone Transmission	0.19	Healthcare	0.67

Panel B: Stock returns conditioned on labor intensity (total staff expenses over net sales)

	Equal-Weighted Portfolios		Value-Weighted Portfolios	
	High – Low ΔRating		High – Low ΔRating	
	Average Return	4-factor Alpha	Average Return	4-factor Alpha
Low labor intensity	0.80** (2.65)	0.72** (2.54)	0.71** (2.41)	0.54** (2.09)
High labor intensity	0.46 (1.08)	0.35 (0.94)	0.15 (0.47)	0.24 (0.31)

Panel C: Stock returns conditioned on labor intensity (compensation expenses over industry output)

	Equal-Weighted Portfolios		Value-Weighted Portfolios	
	High – Low ΔRating		High – Low ΔRating	
	Average Return	4-factor Alpha	Average Return	4-factor Alpha
Low labor intensity	0.83** (2.23)	1.10** (2.55)	0.66** (2.45)	0.74** (2.74)
High labor intensity	0.28 (0.72)	0.24 (0.62)	0.08 (0.20)	0.14 (0.31)

Table IA 11. Portfolios Sorted on Employer Rating Changes: Labor Hiring and Layoffs

The table reports the return performance of portfolio sorted by changes in employer rating (ΔRating), conditional on labor hiring and layoffs. ΔRating is defined as the average employer rating in quarter t minus the average ratings in quarter $t-1$. Each stock remains in the portfolio for three months, and portfolios are either equal- or value-weighted. The breakpoints for partitioning the rating change groups are based on the top and bottom 20% ratings, with High (Low) denoting improvements (reductions) in employee satisfaction. Panel A reports the results after excluding firms that have increased number of employees by more than 10% during the most recent fiscal year. Panel B reports the results after excluding firms that experience layoffs of more than 10% of the number of employees. Portfolio results are reported using equal- and value-weighted portfolio weights. Performance is measured using the average monthly raw return and the Fama-French-Carhart (FFC) 4-factor alpha. Average returns and alphas are presented in monthly percentage terms. The last row reports the differences in monthly average returns and alphas. Newey-West adjusted t -statistics are given in parentheses. *, **, and ***, indicate significance of the difference in returns and alphas at the 10%, 5%, and 1% levels, respectively.

Panel A: Future Portfolio Returns After Eliminating the Top 10% Firms with Labor Hiring

	Equal-Weighted Portfolios		Value-Weighted Portfolios	
	Average Return	4-Factor Alpha	Average Return	4-Factor Alpha
Low ΔRating	0.67 (1.00)	-0.35 (-1.40)	0.27 (0.49)	-0.62** (-2.53)
Middle Group	1.02* (1.70)	-0.02 (-0.15)	0.79 (1.59)	-0.07 (-0.59)
High ΔRating	1.74*** (2.64)	0.78*** (2.65)	1.24** (2.42)	0.39 (1.50)
High – Low	1.07*** (2.79)	1.13*** (2.66)	0.97*** (2.90)	1.01*** (2.67)

Panel B: Future Portfolio Returns After Eliminating the Firms with Layoff Announcements

Low ΔRating	0.87 (1.33)	-0.22 (-1.12)	0.68 (1.45)	-0.29** (-2.26)
Middle Group	1.06* (1.83)	0.04 (0.28)	0.91** (2.38)	0.04 (0.37)
High ΔRating	1.55** (2.61)	0.60** (2.43)	1.31*** (3.28)	0.38 (1.61)
High – Low	0.67** (2.38)	0.82** (2.63)	0.63** (2.52)	0.67** (2.57)

Table IA 12. Change in Employer Ratings and Earnings Surprises

This table reports the results of regressing measures of earnings surprises on changes in employer ratings. In the first three columns, the dependent variable is quarter $t+2$ through $t+4$ analyst earnings forecast error, defined as the difference between the realized earnings in a given quarter and the consensus analyst earnings forecast for that quarter, scaled by the absolute value of the realized earnings. In columns three through six, the dependent variable is the earnings announcement return for quarters $t+2$ through $t+4$, measuring using the three-day cumulative abnormal return surrounding the earnings announcement estimated based on the Fama-French three-factor model. The key independent variable is the change in employer rating (Δ Rating), defined as the average employer rating in quarter t minus the average rating in quarter $t-1$. We also control for other firm characteristics such as size, book-to-market, and momentum which are defined in the appendix. Time-clustered t -statistics are reported in parentheses, with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively. The sample covers June 2008 to June 2016.

	Analyst Earnings Forecast Errors			Announcement Returns		
	Quarter $t+2$	Quarter $t+3$	Quarter $t+4$	Quarter $t+2$	Quarter $t+3$	Quarter $t+4$
Δ Rating	-0.007 (-1.43)	0.003 (0.45)	0.013 (1.65)	0.100 (1.37)	0.013 (0.17)	-0.079 (-1.23)
Size	-0.430*** (-4.22)	-0.497*** (-5.34)	-0.381*** (-5.18)	-2.322*** (-3.17)	-2.653*** (-3.71)	-2.296*** (-3.53)
Book-to-Market	0.120 (1.66)	-0.023 (-0.49)	0.062 (0.86)	-0.481* (-1.76)	0.091 (0.42)	-0.254 (-0.85)
Return $_{t-12,t-2}$	0.015 (0.84)	0.001 (0.08)	0.012 (0.92)	-0.426** (-2.49)	0.062 (0.35)	0.101 (0.62)
Illiquidity	-0.225 (-0.73)	-0.425 (-0.67)	-1.541*** (-3.04)	0.073 (0.93)	-0.098 (-0.95)	-0.154* (-1.78)
Turnover	0.017 (0.81)	0.050* (2.00)	0.099*** (4.23)	0.370* (1.71)	0.203 (0.69)	-0.078 (-0.45)
ROA	-0.020 (-1.60)	-0.010 (-0.73)	-0.015* (-1.72)	-0.265 (-1.38)	0.077 (0.65)	0.009 (0.06)
Forecast Disp.	-0.112 (-1.49)	-0.017 (-0.20)	0.073*** (4.75)	-0.328*** (-6.09)	-0.696*** (-4.87)	-0.123 (-1.44)
Idio. Volatility	0.022 (0.87)	0.008 (0.34)	-0.012 (-0.32)	0.107 (0.42)	0.351** (2.14)	0.113 (0.65)
Inst. Ownership	-0.015 (-1.00)	-0.015 (-0.79)	0.008 (0.65)	-0.057 (-0.43)	-0.124 (-0.57)	-0.185 (-1.25)
Fixed Effects	Time, Firm	Time, Firm	Time, Firm	Time, Firm	Time, Firm	Time, Firm
Observations	7,503	6,785	5,531	8,332	7,515	6,176
R-squared	0.330	0.335	0.353	0.147	0.122	0.145