Tone at the Bottom: Measuring Corporate Misconduct Risk from the Text of Employee Reviews (MS, 2022)

Dennis W. Campbell[a]   Ruidi Shang[b]

[a]Harvard University

[b]Tilburg University

Presenter: Zuocheng Zhang

12 October 2025

P0: Overview

Some Intuitions

What?

- Misconduct:
    - Ethical misconduct: discrimination
    - ESG misconduct: pollution
    - Fraud
    - Serial fraud
- Review Texts:
    - News
    - Report letters
    - Comments

Some Intuitions

Why?

- ▶ Why does employee comments outperforms other sources

How?

- ▶ Frequency
- ▶ Sentiment
- ▶ Supervised or unsupervised analysis
- ▶ Measure the value of information

P1: Research Question

Research Question

This paper investigates:

- ▶ Whether information extracted via text-based statistical methods applied to employee reviews left on the website Glassdoor.com can be used to develop indicators of corporate misconduct risk

Various resources in predicting misconducts:

- ▶ Annual reports, conference calls, balance sheets, media

But these sources are:

1. Highly aggregated
2. Ex post
3. Lack of channels (i.e. internal operations, control mechanism, organizational behaviors)

Motivation 2: Inside Information: Whistleblowing

Employees have the best access to the information on firms' internal operations and controls simply as a by-product of their normal work

Whistleblowing is an important channel: Dyck et al. (JF, 2010), Wilde (TAR, 2017)

Not a promising info, either:
1. High social and economic cost ("HARD INFORMATION")
2. Ex post
3. Lack of incentives

Motivation 3: Info Extracted Glassdoor.com Platform

Glassdoor provides a clear and specific structure for employees to review their firms - "Soft information"

Glassdoor **ratings** can:

- ▶ Predict financial statement line items (Hales et al., 2018)
- ▶ Stock returns (Green et al. 2019)
- ▶ Analyst output (Huang et al. 2020)

Limitation of ratings:

1. **Homogeneous**: do not capture firm-specific information
2. **Noisy**: different interpretations for the same topic
3. **Less information**

Motivation 3: Info Extracted Glassdoor.com Platform

...while texts contains additional information:

Table 3. Correlations Between Text Measures and Ratings

	Rating	(1)	(2)
(1) *MW_index − pros*	−0.18*		
(2) *MW_index − cons*	−0.13*	0.43*	
(3) *MW_index − advice*	−0.16*	0.31*	0.41*

Contribution

Corporate misconduct

- ▶ Detect accounting fraud and misreporting by market and firm characteristics (Brazel et al. 2009, Dechow et al. 2011, Purda and Skillicorn 2015, Ji et al. 2017)
- ▶ **This paper:** Information that employees themselves

Whistleblowing

- ▶ "Hard" whistleblower complaints
- ▶ **This paper:** "Soft" whistleblower

Financial, legal, and reputational risks

- ▶ **This paper:** The index of the paper may be useful in developing leading indicators of the quality and state of a firm's internal control environment or even broader organizational culture

Glassdoor.com

▶ **Anonymous:** Low whistleblowing cost

► **Not negative comment-oriented:** Incentive-compatible
mechanism

Pros*

5 word minimum

Cons*

5 word minimum

Advice for management?

Glassdoor.com

► **Comment info types:**

    ► Direct, first-hand info -> misconduct-related

1.0 ★☆☆☆☆ ⌄   29 Sept 2024   •••

No Highly recommended company

🕵 Delivery driver

| Current employee | 📍 Milpitas, CA |

❌ Recommend   — CEO approval   ❌ Business outlook

Pros
Can get tips. Flexible schedule

Cons
Very chaotic personnel management. Tips are opaque. Unequal job opportunities and discrimination.

Advice to Management
The management of the company is chaotic. The human resource manager can't play the role of a supervisory manager at all.

👏 Helpful   ↗ Share   🐱 1

▶ **Comment info types:**

    ▶ Indirect, generalized info -> firm features, serial and long-term violation-related

3.0 ★★★☆☆   19 May 2025   •••

pressure

Manager

Current employee   ⊙ Hong Kong

○ Recommend   ○ CEO approval   ○ Business outlook

Pros
good career path and will promote

Cons
pressure, and very long working hour

👏 Helpful   ⌲ Share

P2: Hypothesis

Hypothesis

Predictive index from employee reviews can:

- ▶ ...reveal signals of internal control
- ▶ ...independent of ratings, media sentiment, or financial performance
- ▶ ...is therefore a predictive index can forecast future misconducts
- ▶ ...even captures broader patterns — serial or criminal misconduct

P3: Research Design

Variables

Sample

- ▶ United States, publicly traded, and 2008 - 2016, also includes overseas branches
- ▶ Deduct: < 10 reviews
- ▶ 3,438 firms (24,216 firm-year obs.)

Dependent variables

- ▶ From Violation Tracker
- ▶ $\mathbb{1}(Violation)$
- ▶ $\#Violation$
- ▶ *Penalties*

Limitations

- ▶ Penalties are recorded at the enforcement actions
- ▶ Some are not detected of detected but not enforced

Variables

Independent variables

1. Word-cleaning
2. Drop too common (appear $> 50\%$ reviews) or too rare (< 5 reviews) keywords
3. 11,772 unique words

Controls

- **Traditional variables:** Size, leverage, ROA, lagged outcome
- **External info:** Media coverage and sentiment
- **Incremental contribution:** Glassdoor ratings

Independent Variables

Note: This paper only care about the info of employee review text itself, instead of something like sentiments

Inversed Regression

$$E(W_{jit} \mid x_{it}, v_{it+1}) = e^{\alpha_j + \beta_j x_{it} + \phi_j v_{it+1} + \varepsilon_{it}}$$

W_{ijt}: count of word, v_{it+1}: violation, x_{it}: controls

Run 35,316 separate regressions (3 comment categories $\times$ 11,772 words)

Independent Variables

Sum up:

$$\phi_1 \frac{W_{1it}}{\sum W_{it}} + \phi_2 \frac{W_{2it}}{\sum W_{it}} + \cdots + \phi_{11,772} \frac{W_{11,772\,it}}{\sum W_{it}}$$

We can get:

$MW_{index}^{pros} = \sum W_{it}^{pros} = \sum_{j=1}^{11,772} W_{jit}^{pros}$

$MW_{index}^{cons} = \sum W_{it}^{cons} = \sum_{j=1}^{11,772} W_{jit}^{cons}$

$MW_{index}^{advice} = \sum W_{it}^{advice} = \sum_{j=1}^{11,772} W_{jit}^{advice}$

Independent Variables

Features	Violation type			
	Any violations	*Violations - HV*	*Serial violators*	*Criminal violators*
Pay	Pay, money, salaried, receive, rate, hourly	Pay, money, salaried, paycheck, receive, hourly	Pension, wage, raise, salaried, receive, pay, earn, hourly	Cash
Work schedule	Week, vacation, Saturday, schedule, holiday, hour, flexible, time, shift, everyday	Overtime, overwork, week, schedule, shift, Thanksgiving, Saturday, time, flexible, vacation, holiday, everyday	Overtime, shift, week, schedul, everyday, flexible, time	
Organization (re)structure				Merger, reorganization, decentralize
Discrimination	Discrimination, women, female	Discrimination, women, female	Women, white, male	

Summary Statistics

Table 1. Descriptive Statistics

Variable	Description	Mean	Standard deviation	10th percentile	Median	90th percentile
	Outcome variables					
Violation	Indicator for the presence of any violation	0.28	0.45	0	0	1
ViolationHV	Indicator for the presence of any "high-visibility" violation directly related to workers or consumers (e.g., safety, health, employment, wages, hours, and labor relations; product/service safety, consumer protection, etc.)	0.23	0.42	0	0	1
#Violations	Total number of violations	1.39	8.42	0	0	3
#ViolationsHV	Total number of "high-visibility" violations directly related to workers or consumers (e.g., safety, health, employment, wages, hours, and labor relations; product/service safety, consumer protection, etc.)	1.15	8.26	0	0	2
Penalty	Penalties imposed by the relevant regulatory or legal authorities	$15,800,000	$361,000,000	0	0	$300,000
	Glassdoor data					
Rating	Average overall Glassdoor rating	3.13	0.66	2.30	3.14	4.00
Number of Reviews	Number of employee reviews on Glassdoor	79.55	288.77	2	15	158
Number of Words	Total number of words across Glassdoor employee reviews	5,318	16,872	114	1,154	11,241

Prediction and Evaluation

Prediction

- ▶ Gradient-boosting methods
- ▶ $MW_{index}^{pros} + MW_{index}^{cons} + MW_{index}^{advice} + \text{Controls}$
  $\Longrightarrow \text{Violations}_{t+1}$

Evaluation

- ▶ Pseudo-R^2 and AUC
- ▶ Performance difference w and w/o adding the index

# P4: Results

The effectiveness of the index

2.0% - 6.9% individually improvement and 9.2% and 14.1% collectively

Table 4. Performance and Variable Influence for Violation-Prediction Models

|	Prediction performance in test sample					Influence statistics for full model									
	Pseudo-R^2		AUC			MW index									
Outcome	Full model[a]	No indices	Full model[b]	No indices	Lagged outcome	Pros	Cons	Advice	Rating	Size	Leverage	ROA	Press variables	Industry	Year
Violation, %	29.2	27.3	85.0	83.5	44.0	3.6	3.6	2.0	1.9	27.2	3.1	3.3	2.1	9.1	0.1
Violation – High Visibility, %	26.1	23.5	84.1	82.1	37.3	6.9	4.4	2.8	2.7	22.4	4.2	4.2	3.1	12.0	0.1

Predicting Misconduct

Figure 1. Influence Statistics for Predicting Misconduct Risk Outcomes
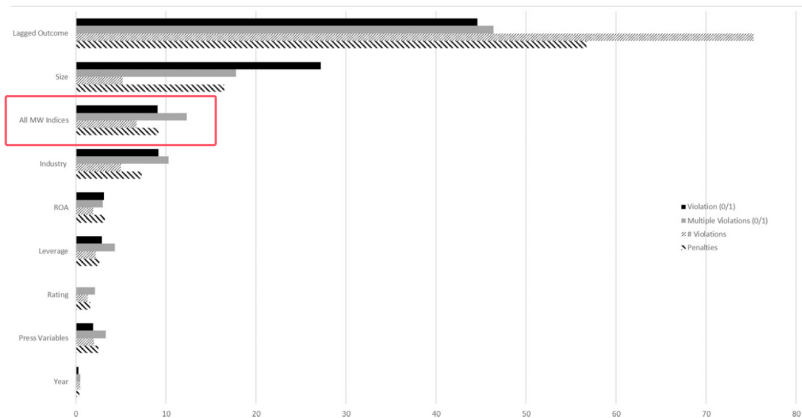
Predicting Serious Violation

1. Transition to serial violation 2. Criminal violation

Figure 2. Influence Statistics for Predicting Serial and Criminal Violator Transitions
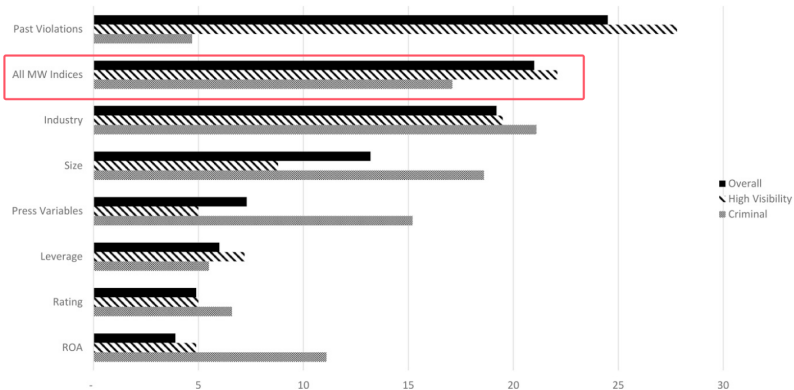
Whistleblower Complaints

Table 7. Employee Comments as a Leading Indicator of Whistleblower Complaints

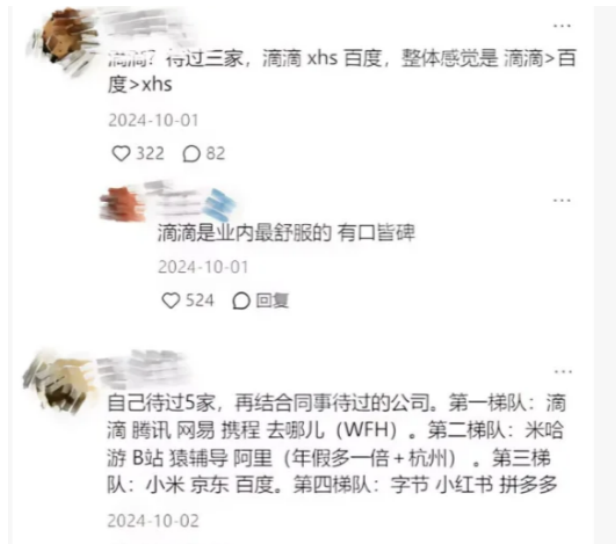| Dependent variable = *Employee Complaint$_t$*	Coefficient	Robust standard error	z	$P > z$
Employee Complaint$_{t-1}$	2.02***	0.11	17.91	0.00
MW_IndexHV$_{t-1}$ – Pros	60.74***	16.86	3.60	0.00
MW_IndexHV$_{t-1}$ – Cons	60.96***	11.03	5.53	0.00
MW_IndexHV$_{t-1}$ – Advice	28.81	21.73	1.33	0.19
Rating$_{t-1}$	−0.22**	0.09	−2.53	0.01
Size$_{t-1}$	0.46***	0.04	12.98	0.00
Leverage$_{t-1}$	0.00	0.00	−1.01	0.31
ROA$_{t-1}$	1.49***	0.58	2.56	0.01
Coverage$_{t-1}$	−0.01	0.02	−0.68	0.49
Sentiment$_{t-1}$	2.91	3.19	0.91	0.36
Industry fixed effects		Yes		
Year fixed effects		Yes		
Psuedo-R^2		37.3%		
N		7,255		

Conclusion

This paper:

1. Investigates the value of review texts, using inversed regression and gradient-boosting method

2. The index contains additional information, compared with external info, whisleblowing info, and Glassdoor ratings

3. Increased out-of-then sample performance in predicting direct firm misconduct, and long-term serial and criminal misconduct

P5: Ideas and Comments

Ideas

1. Chinese data

Maimai

滴滴？待过三家，滴滴 xhs 百度，整体感觉是 滴滴>百度>xhs

2024-10-01

♡ 322 ○ 82

滴滴是业内最舒服的 有口皆碑

2024-10-01

♡ 524 ○ 回复

自己待过5家，再结合同事待过的公司。第一梯队：滴滴 腾讯 网易 携程 去哪儿（WFH）。第二梯队：米哈游 B站 猿辅导 阿里（年假多一倍＋杭州）。第三梯队：小米 京东 百度。第四梯队：字节 小红书 拼多多

2024-10-02

Ideas

1. Chinese data

Rednote

"

中行湖北省分
科技岗是真科技吗，
转正薪资大概多少？
农行工行呢，真诚
求助uu们

ANONYMOUS   关注

中行湖北省分去年我到了体检然后没去，面试的
时候说的轮岗两年起，不保证能回科技岗，工资
很低

06-10

♡ 1   ♡ 3

ANONYMOUS 作者
这样啊🪨
06-10
♡ 赞   ♡ 回复
展开 2 条回复

Dragon,,
佬不去这个实习吗，我感觉实习转正概率还是比
秋招上岸强吧，突然感觉我也应该拒了去大厂实
习的🏢
06-10
♡ 赞   ♡ 2

ANONYMOUS 作者

Comments

1. Employer comment is a more direct information sources, and can be applied to more sources

2. Lacks empirical analysis to prove the effectiveness and application of this index

3. Non-linear methodologies can be applied

Thank you