



Full length article

No rose without a thorn: Corporate teamwork culture and financial statement misconduct

Chenyong Liu ^{a,*}, David Ryan ^b, Guoyu Lin ^c, Chunhao Xu ^d^a California State University, Los Angeles, Los Angeles, CA, USA^b Southern Utah University, Cedar City, UT, USA^c Reh School of Business Clarkson University, Potsdam, NY, USA^d College of Business University of Texas of the Permian Basin, Odessa, TX, USA

ARTICLE INFO

Article history:

Received 24 April 2022

Received in revised form 30 August 2022

Accepted 30 December 2022

Available online 5 January 2023

JEL classification:

G32

G41

M42

Keywords:

Teamwork culture

Financial statement misconduct

Corporate governance

Fraud prevention

ABSTRACT

This study investigates the dark side of corporate teamwork culture on firms' financial reporting behaviors. We used a novel corporate culture measurement developed by machine learning approach (Li et al., 2021), and calculated Benford Score (Amiram et al., 2015) as the proxy for financial misconduct in firms' annual financial statements from 2003 to 2021. We find a positive association between a company's emphasis on teamwork culture and financial statement misconduct; this association is more pronounced when a firm reports no internal control weakness. Additional analyses show that firms with stronger teamwork cultures are more likely to engage in financial statement misconduct when they use a Big 4 accounting firm as an auditor, or they are smaller in size. This research contributes to the collusive fraud literature by identifying a mechanism by which accounting personnel might be complicit and/or participate in financial statement misconduct or fraud. Our findings may be of interest to those tasked with corporate governance in identifying and preventing financial statement fraud.

© 2023 The Author(s). Published by Elsevier B.V. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Culture is a key driver of firm value (Graham et al., 2017). As an important attribute of corporate culture, teamwork is commonly cited as a top company value (Guiso et al., 2015). However, teamwork has two sides. On the one hand, it facilitates innovation, employee loyalty, and workplace cooperation (Tripathy, 2018; Groysberg et al., 2018). On the other hand, a teamwork culture strengthens the social bond of personnel, which makes speaking up against organizational practices an act of disloyalty (Goebel and Weißenberger, 2017); it may also serve as the rationalization for collusive financial statement fraud. Due to the difficulty of observing and measuring company culture, how individuals become involved in financial statement misconduct and related misbehaviors remains an open question (Bhandari et al., 2022). In this study, we use a metric of a corporate culture based on a machine learning approach (Li et al., 2021) to investigate the impact of teamwork on financial statement misconduct.

The theory of social norm proposes that the social environment influences a person's decisions, and an individual is likely to follow a behavior that is prompted by an organization even if that

behavior is not generally perceived as ethical (Reno et al., 1993; Golden, 2021). Therefore, despite the benefits a strong teamwork culture brings, it may lead to unexpected operational and financial consequences. Specifically, financial reporting requires significant teamwork; top executives such as CEOs are likely unable to perpetrate financial misconduct without a broader involvement of other professionals (Fleming et al., 2016). As such, finance and accounting personnel may be complicit with questionable practices in organizations where teamwork is stressed. In such cultures, speaking up against the team may be construed as disloyal and unacceptable (Goebel and Weißenberger, 2017). Moreover, Cressey (1973) developed the model of the Fraud Triangle, which suggests that *pressure*, *opportunity*, and *rationalization* are fundamental catalysts for fraud. Individuals may feel incentivized to be complicit or participate in ethically questionable practices as loyalty is rewarded in team-centered organizations (Singh, 2008). Thus, it is reasonable to expect a possible association between an emphasis on teamwork or collaboration and collusive financial statement fraud. Collectively, we predict that firms with stronger teamwork cultures are associated with higher predicted financial statement misconduct. We further explore whether the association between a firm's teamwork culture and predicted financial statement misconduct is more salient when the assessment and disclosure of internal control over financial reporting (ICFR) effectiveness are required

* Corresponding author.

E-mail addresses: cliu92@calstatela.edu (C. Liu), davidryan@suu.edu (D. Ryan), glin@clarkson.edu (G. Lin), xu_c@utpb.edu (C. Xu).

by law.¹ Financial statement fraud typically involves collusion (Fleming et al., 2016; Bishop et al., 2017). Since internal control deficiency disclosure exposes firms to more scrutiny by auditors, firms engaging in financial statement misconduct may conspire to override internal controls to conceal issues. As a result, we expect that firms with stronger teamwork cultures are associated with higher predicted financial statement misconduct when no ICFR weakness is disclosed.

We use the Benford Score, a relatively new predictor of fraud, as our measure for financial statement misconduct (Amiram et al., 2015). The Score is based upon the mean absolute deviation (MAD) of the frequency of digits appearing in financial statements compared to the theoretical Benford's Law distribution of these digits (Golden, 2021). Supported by the theory of mathematics and statistics (Hill, 1995), the Benford Score has already been widely used in auditing software packages for fraud detection (Golden, 2021). Amiram et al. (2015) demonstrate that the distribution of leading digits reported in financial statements complies with Benford's Law and developed the Benford Score measure. The proxy may be used for financial misconduct prediction in publicly traded companies with adequate financial statement data. Moreover, unlike other commonly adopted measures of financial statement fraud such as identified cases in the Securities and Exchange Commission (SEC) Accounting and Auditing Enforcement Releases (AAER),² the Benford Score can predict firms that may be engaging in financial statement misconduct but not caught yet (Golden, 2021). A larger deviation of the actual from the expected leading digits distribution in the financial statements, reflected by a larger Benford Score, indicates a higher propensity for financial statement misconduct (Chakrabarty et al., 2020).

Our results suggest that a firm's corporate teamwork culture is positively associated with the likelihood of financial statement misconduct. That is, the more emphasis and prominence a firm puts on teamwork as a shared value, the more likely the organization is engaging in financial statement misconduct. This result confirms our assumption that a company greatly extolling the value of collaboration may have negative side effects. We further show that the association between teamwork culture and financial statement misconduct is more pronounced when no ICFR weakness is reported in the firm. This means that either the collusive activity of highly collaborative organizations can successfully circumvent internal controls, or the companies know how to constrain and conceal misconduct to avoid additional scrutiny. Our results remain robust to a set of alternative procedures. Additional analyses show that, for companies with stronger teamwork cultures, the results are more pronounced when the companies are smaller or have Big 4 auditors (i.e., Deloitte Touche Tohmatsu [Deloitte], PricewaterhouseCoopers [PwC], Ernst & Young [EY], and KPMG).

This study contributes to the academic and practice literature in three aspects. First, it extends our knowledge of the determinants of collusive financial statement misconduct in an organization. We provide evidence that corporate culture may play a critical role in people's ethical decision-making process. Second, our research identifies a dark side of organizations that emphasize a strong teamwork culture. Often cited as a benefit, teamwork is usually considered a value-added virtue; however, our results suggest that collusive financial statement misconduct

may be an unexpected consequence of teamwork and collaboration. Third, our paper could be of interest to auditors, investors, and individuals responsible for corporate governance and oversight. Drawing upon the results of this study, investors might better interpret the value of corporate culture, especially teamwork culture, with necessary caveats. Auditors will also be able to assess firms' potential fraud risks by understanding the potential consequences of client culture. Furthermore, Boards of Directors and compliance officers may be able to mitigate the risk of collusive fraud through additional employee training and more direct communication.

The rest of this paper is organized as follows. Section 2 presents the background, literature review, and hypothesis development. Section 3 discusses our research design, including sample selection and empirical models. Section 4 shows the empirical results as well as additional analyses. Section 5 provides the robustness check to support our main tests. Finally, Section 6 concludes the study.

2. Background and hypothesis development

2.1. Financial fraud and misconduct

Financial fraud and misconduct remain prevalent problems despite regulatory and audit efforts to curb them (Anand et al., 2015). As one of the costliest forms of fraudulent activity, financial statement fraud causes a significant loss of value for companies and their shareholders (Bishop et al., 2017).

To illustrate the fundamentals of financial fraud, prior research often cites the Fraud Triangle model (Davis and Pesch, 2013; Golden, 2021), whereby the three elements of *pressure*, *opportunity*, and *rationalization*, culminate as catalysts for financial fraud and misconduct. As Dr. Cressey, the developer of the Fraud Triangle, argued in his work (Cressey, 1973, p.33): "When the trust violators were asked to explain why they refrained from violation of other positions of trust they might have held at previous times, or why they had not violated the subject position at an earlier time, those who had an opinion expressed the equivalent of one or more of the following quotations: (a) 'There was no need for it like there was this time'. (b) 'The idea never entered my head'. (c) 'I thought it was dishonest then, but this time it did not seem dishonest at first'. Later, a new Fraud Diamond model was created by adding the fourth element, *capability*, into the Fraud Triangle. The Diamond model argues that other than incentive, opportunity, and attitude, personal competence and ability play a vital role in fraud participation (Wolfe and Hermanson, 2004).

Although the conceptual structure of fraud is well established with the theoretical models mentioned above, financial statement misconduct is still hard to detect and prevent (Simha and Satyanarayan, 2016; Van Driel, 2018). Because financial misconduct entails personal behavioral, legal, technical, as well as ethical aspects, it is hard to discover a fraud or misconduct in its early stage; in addition, the difficulty of fraud detection is aggravated by the increasing complexity of financial transactions (Reurink, 2018). Some studies rely on predictive measures to indicate the likelihood of financial statement misconduct. For example, Beneish (1999) developed the M-score metric to identify companies that are likely to be financial statement manipulators. The score was calculated ex-post by identifying common ratio anomalies of firms that had received SEC enforcement notices for financial reporting issues. Separately, based on financial ratios' residual regression, Dechow et al. (2011) proposed the F-score to identify potential financial misstatements. Prior literature shows that, to some extent, both the M-score and F-score are effective predictors of financial statement manipulation (e.g., Beneish and Vorst, 2021). Nevertheless, the scores are results of linear combinations of corporate financial performance proxies (e.g., asset

¹ In 2002, the U.S. Congress passed the Sarbanes-Oxley Act (SOX), which mandates the disclosure of effectiveness of internal control over financial reporting (ICFR) by all publicly traded firms and their auditors (Schneider et al., 2009).

² The AAER dataset (<https://www.sec.gov/divisions/enforce/friactions.htm>) is widely used in forensic accounting research as indicators of accounting manipulation, earnings management, and financial frauds (Dechow et al., 2010).

quality, gross margin, sales revenue, and debt leverage), making it challenging to discern the suspected financial misconduct from actual firm performance (Amiram et al., 2015).

Taken together, the prior literature shows that financial statement fraud and misconduct are difficult to detect in organizations because they are concealed, and stakes are high for employees involved if fraud is uncovered (Amiram et al., 2018). Moreover, even though the persistent problem of financial statement fraud is widely recognized in literature, how people become involved in financial misconduct remains an unanswered empirical question (Albrecht et al., 2015; Bishop et al., 2017).

2.2. Corporate teamwork culture and financial misconduct

Culture is viewed by most senior executives as a critical driver of firm value and has the power to influence employee attitudes and decision-making (Graham et al., 2017; Groysberg et al., 2018). For instance, organizational culture is often identified as a critical component of financial decisions (Goebel and Weißenberger, 2017). Furthermore, prior studies have shown that when a company's culture lacks an ethical focus, the company is more likely to have control deficiencies (Liu, 2016). However, little is known about how detailed and specific cultural attributes are associated with financial statement misconduct or fraud.

Among all the cultural factors, teamwork or collaboration is commonly referred to as one of the most important values (Graham et al., 2017). Guiso et al. (2015) report that most Fortune 500 companies advertise teamwork as a top company cultural constituent. This is not surprising as the benefits of teamwork are well documented. Particularly, teamwork facilitates innovation, creativity, and learning within companies (Tripathy, 2018). A strong teamwork culture also enhances employee retention, organizational loyalty, and workplace engagement (Groysberg et al., 2018). Because of the importance of collaboration, the ability to work as part of a team is highlighted in the business education curriculum as a critical soft skill that students need to develop before entering the workforce (Oosthuizen et al., 2021).

While teamwork is generally regarded as a positive trait of organizational culture, it also has a dark side. Teams allow the individual to feel like they are a part of something larger than themselves (White and Lean, 2008); when teamwork is overemphasized, individuals may acquiesce to group consensus even if the direction is questionable – a phenomenon referred to as groupthink (Scharff, 2005). Free and Murphy (2015) conducted one of the earliest comprehensive ex-post studies on collusive fraud through interviews of 37 incarcerated persons involved in collusion. The study documents a necessary tie between individuals and their organizations that facilitates fraud. More than 80% of the financial statement frauds included in the research were characterized by functional bonds where most of the participants believed that the financial misconducts were perpetrated for the overall benefit of their teams. These results suggest that there is a potential commonality between teamwork culture and the rationalization of collusive financial frauds. Additionally, with a case study, Scharff (2005) finds that teamwork was often emphasized as part of company culture in WorldCom, which facilitated the scale and duration of the notorious financial statement fraud. Before its cataclysmic downfall, Enron was also lauded as an example of strong organizational teamwork (Kulik, 2005).

Individuals, by nature, are influenced by organizational culture, and highly structured organizations that emphasize teamwork as a cultural value may cause employees to assess the impact on the team as a key criterion in ethical decision making (Groysberg et al., 2018). People feel incentivized to be important and contributing members of the team as loyalty is often rewarded in team-centered organizations (Singh, 2008); however,

the incentive is also one of the three sides of the Fraud Triangle model and is often assumed to be pecuniary. As financial reporting requires significant teamwork and broader involvement from accounting and finance personnel, financial statement misconduct inevitably requires a team effort to be successful at remaining undetected by auditors (Bishop et al., 2017; Fleming et al., 2016). At a minimum, corporate staff may be complicit in questionable practices in companies, but when firms emphasize teamwork, it may inadvertently foster a culture that is conducive to financial statement misconduct. Therefore, we formalize our first hypothesis as follows:

H1. Firms with stronger teamwork culture are associated with higher predicted financial statement misconduct.

2.3. Corporate internal control and financial misconduct

Prompted by financial reporting fraud at Enron and other companies, the Sarbanes–Oxley Act of 2002 (SOX) was established to improve internal controls over financial reporting (ICFR), and to reduce incidents of financial reporting misstatements by creating an obligation for companies and their external auditors alike to assess and disclose the effectiveness of ICFR (Albrecht et al., 2015; Lowe et al., 2015). While the adoption of SOX has improved financial statement reliability through the improvement of internal monitoring, the notion that internal controls post-SOX has reduced incidents of fraud is debatable (Anand et al., 2015). In particular, ICFR makes the perpetration of financial misconduct by an individual more difficult (Donelson et al., 2017). Still, financial statement fraud typically involves collusion (Bishop et al., 2017); as such, these controls may be circumvented by a team (Fleming et al., 2016).

Jollineau et al. (2012) find that companies with strong collaboration or teamwork cultures foster an affinity between team members and finance leaders, which ultimately reduces the effectiveness of internal controls. In organizations where teams have undertaken financial statement misconduct, there will be a need for team members to remain loyal and keep issues undetected (Singh, 2008), which requires internal controls to at least appear to be operating effectively. Because firms with strong teamwork cultures will be focused on achieving goals for the team's benefit, whereas reported ICFR failures expose firms to higher levels of scrutiny by internal corporate governance and external auditors, it is reasonable to expect that collusive teams will avoid internal control findings. Collectively, we formalize our second hypothesis as follows:

H2. Firms with stronger teamwork cultures are more associated with predicted financial statement misconduct when no internal control issues are reported.

3. Research design

3.1. Measure of corporate teamwork culture

O'Reilly and Chatman (1996, p.160) assert that corporate culture is "a system of shared values and norms that define appropriate attitudes and behaviors for organizational members". Biggerstaff et al. (2015) find that employees take cues from the "tone from the top" that guide day-to-day operating decisions. As such, a company's leadership may set the firm's attitudes towards ethical decisions. Research finds that financial statement fraud requires more than the involvement of key executives alone as the financial reporting process involves a wide spectrum of finance and accounting personnel working together (Tillman, 2009). We argue that the individual's need to belong to and contribute to

the perceived success of the team is a mechanism by which finance and accounting individuals collude to facilitate financial statement misconduct or fraud.

To answer the research question of this research, we utilize the score of *Teamwork* proposed by Li et al. (2021) to measure the corporate teamwork culture of public U.S. firms from 2003 to 2018. Using an innovative machine learning technique, Word Embedding Model, Li et al. (2021) analyze the most-mentioned culture highlights in the S&P 500 firms' corporate websites: innovation, integrity, quality, respect, and teamwork (Guiso et al., 2015). With the key-value words generated for each culture dimension after their analysis, Li et al. (2021) examine more than 200,000 earnings call transcripts and create a dictionary of cultural values. The dictionary is then used to assess the cultural values of each firm in the sample pool. We follow the methodology suggested by Li et al. (2021) but focus specifically on the teamwork culture dimension for our current study.³

The teamwork culture proxy proposed by Li et al. (2021) has several advantages over other measures. First, the teamwork culture score we employ is derived from earnings call transcripts, which directly reflect firm leadership's attitude instead of more sanitized disclosures in regulatory filings or websites (Li et al., 2021). For example, unlike the culture-related information disclosed on company websites or press releases, which could be specially created for marketing purposes, the discourse in earnings announcements cannot be polished immediately by corporate executives answering questions (Lee, 2016). Therefore, culture scores gleaned from earnings calls would more closely reflect the mind of the firm leadership. Second, Li et al. (2021) leveraged a machine learning approach instead of relying on the subjective method of counting certain keywords' recurrence based on some word lists that share similar meanings (e.g., Harvard's General Inquirer tag categories). Creating a reliable word list/dictionary for measuring organizational culture requires strong linguistic knowledge in business applications (Loughran and McDonald, 2016); it is also subject to researcher bias through manual adjustments (Loughran and McDonald, 2011), thus making the results discretionary. The machine learning method developed by Li et al. (2021) automates the identification of words and phrases associated with teamwork and creates a relatively exhaustive culture dictionary. Third, when numerically scoring the teamwork culture, Li et al. (2021) specifically lower the weights on some frequently mentioned words in earnings calls, which mitigates noise from repetition.

3.2. Measure of financial misconduct

Named after Frank Benford, who noticed that people check the first several pages more frequently than the later pages of a common logarithms table (Benford, 1938), Benford's Law is widely recognized and used as an effective tool to detect financial fraud (Nigrini, 2012). In general, the Law suggests that for the data that are not specifically manipulated or assigned (e.g., the numbers of local population naturally grow in different cities, etc.), more numbers start with the first digit as "1" than "2", with the first digit as "2" than "3", and so on (Da Silva and Carreira, 2013). By reviewing different types of accounting data, Durtschi et al. (2004) postulate that financial statement data are likely to conform to Benford's Law, and a Benford analysis could be useful in forensic accounting.

³ Li et al. (2021) disclose their Python codes for earnings call textual analysis and model training in a GitHub repository. The codes are available at <https://github.com/MS20190155/Measuring-Corporate-Culture-Using-Machine-Learning>. We appreciate the authors for the codes as well as other help to obtain their corporate culture scores.

In the current study, we capture the likelihood of financial misconduct by using the Benford Score, a proxy created by Amiram et al. (2015). Exploiting the statistical distribution of financial numbers, the Benford Score is a firm-year measure that estimates the level to which the empirical distribution of a firm's financial statement digits deviates from the theoretical distribution suggested by Benford's Law (Amiram et al., 2015). Compared with other existing measures of fraud prediction in financial statements (e.g., Beneish M-Score and Dechow F-Score), the Benford Score has many advantages. For example, the Benford Score does not require complete time-series or cross-sectional data and does not correlate with firm-specific characteristics (Golden, 2021). More importantly, the Benford Score can better predict unobserved financial and accounting frauds with fewer errors (Durtschi et al., 2004; Golden, 2021).

Prior literature shows that the aggregate Benford Score is 0.0009, which is consistent with the theoretical prediction of Benford's Law (e.g., Nigrini, 2012).⁴ Furthermore, accounting information is generated by a different natural process which means that financial reporting data meets the criteria in Hill's (1995) theorem (Golden, 2021); consequently, most accounting data is compatible with Benford's Law, making it a useful fraud predictor (Durtschi et al., 2004). Accordingly, the leading digit of numbers in financial statements should fit the distribution proposed by Benford's Law. Amiram et al. (2015) further support the notion that there is a positive association between the Benford Score and the propensity of material financial misstatements and data manipulation.

The metric of the Benford Score exploits the formula below to determine the probability with which the leading digits of numbers in a financial statement should follow:⁵

$$(d) = \log_{10}(1 + 1/d), \quad (1)$$

where $d = 1, 2, \dots, 9$, and P stands for the probability of the number's frequency with all the data included. Formulated on Eq. (1), the probability of the number "1" appearing as the first digit is about 30%, whereas the larger digits (e.g., 7, 8, 9) have less frequency to take the leading position.⁶

Following prior literature (Amiram et al., 2015; Chakrabarty et al., 2020), we obtain all firms' annual financial statement data between 2003 and 2021 from Compustat North America. Next, we drop all the non-numerical variables and delete all the data not included in the Balance Sheet, Income Statement, and Statement of Cash Flows. The dataset is then filtered with the following procedure used in extant studies (e.g., Golden, 2021) to calculate the Benford Score: (1) for numerical financial statement data with an absolute value that is less than one, we extract its first non-zero digit; (2) all the missing variables are set to zero; (3) observations for firms with negative total assets balance are excluded, and (4) observations with less than 100 line items reported in their financial statements are dropped from the sample. After the data filtering process, we calculate the Benford Score by following

⁴ Different from the Benford Score of specific firms, "aggregate benford score" was used to prove that the measure of Benford Score leveraged in this study is reliable. More specifically, if the measure of Benford Score perfectly follows the theoretical digits' distribution of the Benford's Law, it should show an aggregate of zero. According to Nigrini (2000), an aggregate benford score between 0.000 and 0.004 indicates a "close conformity" of Benford's Law. In the current study, *Benford_Score's* aggregate is 0.0009, signifying high validity of our measure.

⁵ The formula was originally introduced by Simon Newcomb, a Canadian American astronomer as well as applied mathematician in 1881. In 1938, Frank Benford, an American electrical engineer and physicist, rediscovered and generalized the formula, which makes it be widely named as Benford's Law.

⁶ According to the distribution of Benford's Law, the theoretical frequency for 1, 2, 3, 4, 5, 6, 7, 8, 9 to be the leading-digit is 0.3010, 0.1761, 0.1249, 0.0969, 0.0792, 0.0669, 0.0580, 0.0512, and 0.0458, respectively.

Table 1
Sample selection.

Firm-year observations available in Compustat North America from 2003 to 2021	212,214
Less:	
Firm-year observations of firms not incorporated in the U.S.	58,068
Firm-year observations without enough earnings calls' information to generate <i>Teamwork_Score</i>	87,632
Firm-year observations without enough financial statement data to generate <i>Benford_Score</i>	11,671
Firm-year observations without enough data for control variables	8,855
Final sample of firm-year observations	45,988

the steps prescribed by Amiram et al. (2015). We measure the extent to which the filtered financial statement data deviates from the theoretical distribution established by Benford's Law which identifies the likelihood of fraud and financial misconduct.

Specifically, we generate the leading digits' frequency distribution (from number "1" to "9") in financial statements and summarize the absolute value of the differences between the actual distribution (AD) and expected distribution (ED) of leading digits for each firm-year observation, and then scale the total sum by nine. The absolute value of the differences between AD and ED is calculated as below:

$$\text{Benford Score} = \left(\frac{\sum_{i=1}^K (|\text{AD} - \text{ED}| i)}{K} \right) \quad (2)$$

where AD is the actual empirical frequency of the leading digit and ED is the theoretical frequency expected theoretical frequency based on Benford's distribution. K is the highest number of leading digits in financial statements, which is "9". To illustrate the calculation of the Benford Score, let us assume 50% of firm A's financial statement numbers have a leading digit of "1", 30% of the numbers have a leading digit of "2", and 20% of the numbers start with the digit of "3". Because the theoretical/expected frequencies of digit 1, 2 and 3 under Benford's Law are 30.1%, 17.6%, and 12.5%, firm A's Benford Score is 0.286 (i.e., $|50\% - 30.1\%|/1 + |30\% - 17.6\%|/2 + |20\% - 12.5\%|/3$).

Consistent with the results in existing literature such as Amiram et al. (2015) and Golden (2021), the mean of original Benford Score values in the current study is close to zero, leading to the estimated coefficients in our empirical model (reported in next section) close to zero as well. As a result, in the regression model and Eq. (2), we enlarge the original Benford Score by 1000 times so that the interpretation of the coefficients is more implicit.⁷ Because the Score reflects the difference in leading digits' frequency between the actual and expected distribution, as the Score increases, the likelihood of financial statement misconduct also increases.

3.3. Data and sample selection

We initiate our sample selection process with 212,214 firm-year observations in Compustat North America from 2003 to 2021. The sample period starts in 2003 as it is the year when Sarbanes-Oxley Act (SOX) came into effect. Next, to mitigate the impact of different regional cultures on financial operations (Khlif, 2016), we eliminate 58,068 firm samples not incorporated in the U.S. Following Li et al. (2021), we use earnings call transcripts to calculate *Teamwork_Score* as our proxy measure of a corporation's teamwork culture. We exclude 87,632 observations that do not have enough earnings call transcript data. Also, we drop 11,671 observations without sufficient data to calculate *Benford_Score* and 8,855 observations with inadequate control variable data. The final sample includes 45,988 firm-year observations. Table 1 summarizes our sample selection process.

⁷ By comparing the regression results of the model with Benford Score both multiplied and not multiplied by 1000, we find that all the variables' statistical factors such as standard errors, t -values, and p -values, etc. are all the same.

3.4. Empirical models

To test our first hypothesis (H1) of the association between corporate teamwork culture and the propensity for financial statement misconduct, we modify the models employed in Zhang et al. (2020) and Golden (2021), and develop our OLS regression model as follows:

$$\begin{aligned} \text{Benford_Score} = & \alpha + \alpha_1 \text{Teamwork_Score}/\text{Teamwork_Rank} \\ & + \alpha_2 \text{Size} \\ & + \alpha_3 \text{ROA} + \alpha_4 \text{Big4} + \alpha_5 \text{LEV} + \alpha_6 \text{MTB} \\ & + \alpha_7 \text{INV} + \alpha_8 \text{REC} \\ & + \alpha_9 \text{Distress} + \alpha_{10} \text{Foreign} + \alpha_{11} \text{Special_Item} \\ & + \alpha_{12} \text{Busy_Season} \\ & + \alpha_{13} \text{Sales_Growth} + \alpha_{14} \text{CEO_Dual} \\ & + \text{Year and Industry Fixed Effects} + \varepsilon, \end{aligned} \quad (3)$$

where the dependent variable, *Benford_Score*, is a metric of the likelihood of financial statement misconduct derived from Benford's Law. Because the numerical values of the original Benford Scores generated with the calculation method of Amiram et al. (2015) are close to zero (mean ≈ 0.027), we create *Benford_Score* by enlarging the original Benford Score by 1000 times so that our reported estimated coefficients in Eq. (3) are more easily interpreted.⁸ The independent variable of interest in Eq. (3) is *Teamwork_Score*, a continuous variable proposed by Li et al. (2021) to capture teamwork culture in firms. We include an ordinal variable, *Teamwork_Rank*, as the alternative to *Teamwork_Score* in Eq. (3). *Teamwork_Rank* shows the discrete values ranging from 1 to 4 according to the percentiles of *Teamwork_Score* of all the samples from 2003 to 2021. A company with the highest level (top 25th percentile) of teamwork culture scores is denoted with a *Teamwork_Rank* of 4, and the lowest level (bottom 25th percentile) has a *Teamwork_Rank* of 1. This design enables us to better test H1 by further examining the potential influence of teamwork culture on financial statement misconduct among different firm groups and establishes the setting for our additional test in the next section. Because a higher value of *Benford_Score* connotes a higher likelihood of financial statement misconduct (Amiram et al., 2015; Chakrabarty et al., 2020; Golden, 2021), we expect the coefficient of *Teamwork_Score* and *Teamwork_Rank* (i.e., α_1) to be positive and statistically significant. A positive α_1 indicates that a more cooperative teamwork culture within a firm facilitates financial statement misconduct.

Control variables are included in our model as some firm-level factors significantly affect a company's internal control and fraud prevention performance. In Eq. (3), by following Liu et al. (2021) and Golden (2021), we control for company size (*Size*), profitability (*ROA*), the pressure of business expansion (*MTB* and *Sales_Growth*), debt burden (*LEV*), and current assets (*INV* and *REC*) during the fiscal year when a firm's teamwork culture score is measured. In addition, we use *Big4* and *Busy_Season* to mitigate

⁸ Untabulated results show that after multiplying the dependent variable (*Benford_Score*) by 1000, the clustered standard errors and p -values of all variables in Eq. (1) remain the same.

the impact of audit quality and auditor attentiveness on corporate financial misconduct (e.g., Feng et al., 2009; Lopez and Peters, 2012). Researchers find that there is an association between financial distress and fraud (e.g., Mahama, 2015); as a result, we incorporate an indicator variable, *Distress*, into the model. Based on Altman's Z Score, *Distress* equals 1 if a firm has an Altman's Z Score less than 1.8, meaning the company is in the financial danger zone and approaching bankruptcy (Altman, 2018). As firms with significant foreign business interests are subject to more regulatory supervision and auditor efforts (Bentley et al., 2013), we use an indicator variable, *Foreign*, to control for a company's global footprint. *CEO_Dual* is used in the model to control a firm's corporate governance quality, which affects financial misconduct (Velte, 2021). Finally, we include *Special_Item* as a control variable in Eq. (3) as prior research suggests that the disclosure of special financial items is associated with earnings manipulation and fraud (Abbott et al., 2000; McVay, 2006; Brazel et al., 2009). Detailed definitions of the variables are summarized in Appendix.

We do not expect a specific direction of *Size* because large companies could have adequate accounting policies and more well-trained staff, thus leading to a better ICFR system (Ge and McVay, 2005). However, with more substantial bargaining power, large companies may be more likely to make internal staff and external auditors acquiesce to some misconducts (e.g., Carcello and Nagy, 2004a). Therefore, we do not predict the impact of *Size* in Eq. (3) but leave it as an empirical question for an additional test.⁹ We expect the signs of *ROA* and *Big4* to be negative because a firm's profitability and auditor competence are positively associated with financial compliance (Ge and McVay, 2005). Nonetheless, we assume that the direction of *Busy_Season* is positive in Eq. (3) since the pressure on auditors during a busy season may decrease overall audit quality (e.g., Gul et al., 2017). Furthermore, the estimated coefficients of *MTB* and *Sales_Growth* are expected to be positive as the higher pressure of business growth expectations may incentivize firms to engage in financial statement misconduct or fraud (e.g., Beneish, 1997; Carcello and Nagy, 2004a). Krause et al. (2014) argue that a CEO simultaneously serving as the board chairman could reduce corporate financial fraudulent behaviors when the CEO's compensation includes stock and option grants; therefore, we expect that *CEO_Dual* in the model is negatively associated with *Benford_Score* because our samples are all listed firms, and most listed firms provide stock/option as part of CEO compensation (Frydman and Jenter, 2010). Finally, we do not predict the directions of *LEV*, *Inv*, *Rec*, *Distress*, *Foreign*, and *Special_Item*. On the one hand, a higher debt level and more balance of current assets such as inventory and accounts receivable provide incentives and opportunities for financial statement manipulations (e.g., Dalniak et al., 2014). On the other hand, companies with greater potential to manipulate financial statements are often subject to stronger monitoring so that they might have less opportunity to commit fraud. For example, companies with large amounts of debt are typically monitored closely by their creditors (Dhaliwal et al., 2011). Therefore, it is difficult to determine how debt ratios, financial distress, foreign business dealings, and special items affect corporate behaviors in the current study.

To examine the association between financial statement misconduct, teamwork culture, and internal control issues (H2), we use the information reported under SOX 302 as a proxy of internal

control effectiveness. Unlike SOX 404, which requires internal control over financial reporting (ICFR) attestation opinions issued by independent auditors, SOX 302 requires a company's chief officers (typically CEOs and CFOs) to disclose their internal assessment of ICFR effectiveness. We argue that SOX 302 data are more suitable for Eq. (3) than SOX 404 opinions from external auditors since SOX 302 information better reflects the internal corporate culture.¹⁰ Although SOX 302 mandates a firm's management executives to comment on internal control issues on both a quarterly and annual basis, we only focus on the annual reports to align with *Benford_Score*, which is based on annual financial statements.

Because our measure of teamwork culture (i.e., *Teamwork_Score*) is continuous whereas the measure of internal control effectiveness is dichotomous (i.e., effective vs. ineffective), it is hard to accurately interpret the result of the interaction term of these two proxies of different types (West et al., 1996). Accordingly, we test H2 by splitting the entire sample into two subgroups (i.e., the group of SOX 302 effective and the group of ineffective) and run Eq. (3) with the data from the two groups, respectively.¹¹ Consistent with the prediction of H2, we expect the estimated coefficient of *Teamwork_Score* in the SOX effective samples' group to be positive and statistically significant, whereas the coefficient of *Teamwork_Score* in the SOX ineffective group to be insignificant.

4. Results

4.1. Descriptive statistics

Table 2a reports the summary statistics of the variables contained in the main regression analysis. There are 45,988 firm-year observations in the final sample pool. The mean of *Benford_Score* from 2003 to 2021 is 27.334. Because we amplified the original Benford Score by 1000 times, the mean of the unprocessed Benford Score is 0.02733,¹² which is consistent with the measurements reported in prior studies (e.g., Amiram et al., 2015; Golden, 2021). The mean of the variable of interest, *Teamwork_Score*, is 2.228, with a standard deviation of 1.427. As the median of the measure is 1.860, it indicates that the distribution of *Teamwork_Score* is right-skewed. The descriptive statistics of other variables are also generally consistent with the findings in the prior literature on forensic accounting research using a large scale of samples (e.g., Amiram et al., 2015). Table 2b includes all the variables' Pearson correlation coefficients in the main regression analysis. All continuous variables are winsorized at the 1st and 99th percentiles. The variance inflation factors (VIFs) for all variables in our model are less than ten, indicating that collinearity is not a concern in the regression analysis.

¹⁰ In an untabulated test, we replace the companies' self-reported internal control assessment under SOX 302 with the ICFR audit opinions issued by external auditors under SOX 404 (b). The regression results obtained are generally consistent with the outcomes of our tabulated main analyses.

¹¹ In an untabulated test, we also include the interaction term of *Teamwork_Score* and SOX 302 ICFR effectiveness dummy variable in the model to examine H2. The result shows that such an interaction term is positive and significant, which generally suggests the same conclusion we can obtain from the current H2 test.

¹² The mean of the unprocessed *Benford_Score* is 0.02733. It is not contradict to Benford Score's aggregate of 0.0009 mentioned in Footnote 4. The aggregate of Benford Score is the Mean Absolute Deviation (MAD) of the leading digits in all the financial statements of all sample firms, which is different from the mean/average of the *Benford_Score* of each specific firm. The aggregate of Benford Score is used to check if financial statement data follow the Benford's Law, whereas the mean of *Benford_Score* reflects the average value our proxy measuring financial statement misconduct in different sample firms.

⁹ In the "Result" section of this paper, we include the results of an additional test to provide more insights about how company size affects the propensity for corporate financial misconduct in the circumstance of teamwork culture.

Table 2a
Panel A: Descriptive statistics.

Variable	Mean	Std Dev	25th Pctl	Median	75th Pctl
<i>Benford_Score</i>	27.334	8.329	21.345	26.457	32.342
<i>Teamwork_Score</i>	2.228	1.427	1.272	1.860	2.758
<i>Teamwork_Rank</i>	2.435	1.113	1.000	2.000	3.000
<i>Size</i>	7.606	1.776	6.309	7.486	8.741
<i>ROA</i>	0.012	0.130	0.001	0.032	0.070
<i>Big4</i>	0.873	0.333	1.000	1.000	1.000
<i>LEV</i>	0.232	0.213	0.040	0.196	0.360
<i>MTB</i>	3.094	5.219	1.279	2.076	3.605
<i>Inv</i>	0.087	0.115	0.000	0.036	0.135
<i>Rec</i>	0.159	0.166	0.051	0.113	0.193
<i>Distress</i>	0.458	0.498	0.000	0.000	1.000
<i>Foreign</i>	0.554	0.497	0.000	1.000	1.000
<i>Special_Item</i>	0.775	0.417	1.000	1.000	1.000
<i>Busy_Season</i>	0.743	0.437	0.000	1.000	1.000
<i>Sales_Growth</i>	0.098	0.266	-0.018	0.066	0.171
<i>CEO_Dual</i>	0.455	0.498	0.000	0.000	1.000

4.2. Multivariate analysis of H1

Table 3 shows the empirical results for H1 by examining the relationship between corporate teamwork culture (measured by *Teamwork_Score* and *Teamwork_Rank*) on the propensity for financial misconduct (measured by *Benford_Score*). In Column 1 of Table 3, the coefficient of the variable of interest, *Teamwork_Score*, is positive and statistically significant (0.235 with p -value < 0.001). This means that firms with a stronger teamwork culture are more likely to engage in financial statement misconduct, which is consistent with H1. When we replace the variable of interest with *Teamwork_Rank*, the results are still robust. Consistent with the outcomes in Table 3 Column 1, the estimated coefficient of *Teamwork_Rank* in Column 2 is 0.150 (p -value of 0.003). This suggests that firms emphasizing a teamwork culture are associated with higher predicted financial statement misconduct or fraud. In sum, the results in Table 3 support H1.¹³

There is a concern that the Covid pandemic since early 2020 strongly changed the working style in many firms (e.g., remote working), which could influence corporate financial misconduct as well. To mitigate the concern, we updated our model in an untabulated test by incorporating the interaction term of *Covid_19* (which equals to 1 when a firm-year observation is in or after FY 2019) and *Teamwork_Score* specifically shows the joint effect of Covid-19 pandemic and corporate teamwork culture. We do not find any statistical significance for the interaction term of *Covid_19* and *Teamwork_Score*, meaning the joint effects of the pandemic and teamwork culture are not statistically relevant.¹⁴

4.3. Multivariate analysis of H2

Table 4 shows the hypothesis test results for H2, which hypothesizes that firms with stronger teamwork culture are associated with a higher likelihood of financial misconduct when they have no internal control issues reported. Column 1 of Table 4 reports the results of running Eq. (3) based on the firm-year observations with ineffective ICFR design and implementation

¹³ Because the impact of corporate teamwork culture on financial misconduct in the circumstance of internal control weakness will be specifically examined in H2, we do not include internal control related variables in Eq. (3). However, in an untabulated test, we get consistent outcomes as we obtained in the H1 main test even with internal control factor (i.e., ICFR attestation opinions under either SOX 404 or SOX 302) included in the model as a control variable.

¹⁴ We highly suggest that the insignificant results of the *Covid_19* variable to be interpreted with caution as our original research design was not specifically geared to study the impact of Covid. We do not have adequate data to control for the factors associated with Covid spread in different areas (e.g., location fixed effects).

according to SOX 302 reports.¹⁵ The estimated coefficient of *Teamwork_Score* is insignificant (0.204 with a p -value of 0.253), indicating that, when there is an internal control problem disclosed by the executive management team, no statistical relationship between corporate teamwork culture and the likelihood of financial statement misconduct exists. On the contrary, the results in Column 2 of Table 4a show that when firms do not report any issues in ICFR, the estimated coefficient of *Teamwork_Score* is positive and statistically significant (0.246 with p -value < 0.001). Furthermore, the F-test shows that the coefficients of *Teamwork_Score* between the SOX 302 effective and ineffective groups are significantly different from each other (F-statistics of 4.38 with p -value < 0.01). Consistent with our H1 test, in Table 4b, we also report the outcomes of multivariate analysis of H2 by replacing *Teamwork_Score* with *Teamwork_Rank*. The findings are similar to those in Panel A. These results imply that when no internal control deficiencies are reported, a stronger teamwork culture might facilitate a company to engage in collusive financial statement fraud. The possible reasons for such a finding include: (1) for financial statement misconduct to remain concealed, the corporate management team must circumvent internal controls while making them appear effective; (2) firms constrain financial statement misconduct when the company's ICFR is indicated to be ineffective, which may raise the specter of wrongdoing and expose the misconduct. Either reason deserves more attention from auditors and investors of the firm.

4.4. Cross-sectional test for Big 4 vs. non-Big 4 auditors

To further explore the relationship between corporate teamwork culture and financial statement misconduct, we perform additional tests centered on available data. Because prior literature documents that the risk control mechanism in Big 4 accounting firms is significantly different from that in non-Big 4 firms (e.g., Khurana and Raman, 2004), we first conduct a cross-sectional test to examine how Big 4 and non-Big 4 auditors influence their clients' financial misconduct in the circumstance of having a strong corporate teamwork culture.

We split the full samples into subgroups as indicated by whether a company engages audit services from Big 4 accounting firms or not. Column 1 of Table 5 reports the outcomes of Eq. (3) but only for the companies using Big 4 auditors, whereas Column 2 shows the results for companies employing non-Big 4

¹⁵ In an untabulated test, we mitigate the concern that our result is driven by the difference in sample sizes between the SOX 302 effective and ineffective observations by leveraging one-to-one propensity score matching (PSM) based on size, ROA, and MTB. The PSM test results are similar to those obtained in Tables 4a and 4b.

Table 2b

Panel B: Correlation table.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Benford_Score	1.000														
(2) Teamwork_Score	0.097***	1.000													
(3) Size	-0.163***	-0.215***	1.000												
(4) ROA	-0.165***	-0.291***	0.254***	1.000											
(5) Big4	-0.083***	0.009*	0.263***	0.061***	1.000										
(6) Lev	-0.029***	-0.034***	0.137***	-0.123***	0.056***	1.000									
(7) MTB	0.007	0.126***	-0.024***	0.059***	0.050***	-0.034***	1.000								
(8) Inv	-0.067***	-0.204***	-0.145***	0.070***	-0.006	-0.108***	-0.044***	1.000							
(9) Rec	0.030***	-0.124***	0.095***	0.039***	-0.180***	-0.226***	-0.060***	-0.049***	1.000						
(10) Distress	-0.004	0.130***	-0.024***	-0.397***	-0.005	0.353***	-0.088***	-0.165***	-0.206***	1.000					
(11) Foreign	-0.230***	0.025***	0.048***	0.139***	0.109***	-0.097***	0.080***	0.113***	-0.048***	-0.087***	1.000				
(12) Special_Item	-0.198***	0.007	0.111***	-0.064***	0.051***	0.133***	-0.035***	0.011**	-0.013**	0.104***	0.187***	1.000			
(13) Busy_Season	0.054***	0.047***	0.104***	-0.089***	-0.007	0.128***	-0.006	-0.288***	0.047***	0.120***	-0.129***	-0.007	1.000		
(14) Sales_Growth	0.055***	0.107***	-0.051***	0.073***	-0.014***	-0.030***	0.108***	-0.048***	-0.012**	-0.064***	-0.028***	-0.071***	0.036***	1.000	
(15) CEO_Dual	-0.046***	-0.070***	0.091***	0.076***	0.030***	-0.012**	0.002	0.029***	0.028***	-0.052***	0.016***	-0.036***	-0.002	0.017***	1.000

(1) *, **, and *** indicate significance at $p < 0.10$, $p < 0.05$, and $p < 0.01$ levels, respectively.(2) We do not include the variable of *Teamwork_Rank* in this table because the correlations of *Teamwork_Rank* with other variables are similar to those of *Teamwork_Score*.

Table 3
Multivariate analysis result for H1 (corporate teamwork culture and financial misconduct).

Dependent variable = <i>Benford_Score</i>			
Independent variables	Expected sign	(1) Full sample Coefficients (<i>p</i> -values) n = 45,988	(2) Full sample Coefficients (<i>p</i> -values) n = 45,988
Constant		32.497*** (0.000)	32.768*** (0.000)
<i>Teamwork_Score</i>	+	0.235*** (0.000)	
<i>Teamwork_Rank</i>	+		0.150*** (0.003)
<i>Size</i>	+/-	-0.798*** (0.000)	-0.809*** (0.000)
<i>ROA</i>	-	-6.705*** (0.000)	-7.075*** (0.000)
<i>Big4</i>	-	0.096 (0.599)	0.120 (0.512)
<i>LEV</i>	+/-	-1.110*** (0.000)	-1.211*** (0.000)
<i>MTB</i>	+	0.028*** (0.006)	0.030*** (0.003)
<i>Inv</i>	+/-	-1.029 (0.183)	-1.347* (0.081)
<i>Rec</i>	+/-	-0.567 (0.337)	-0.717 (0.225)
<i>Distress</i>	+/-	-0.481*** (0.001)	-0.472*** (0.002)
<i>Foreign</i>	+/-	-1.928*** (0.000)	-1.933*** (0.000)
<i>Special_Item</i>	+/-	-2.604*** (0.000)	-2.615*** (0.000)
<i>Busy_Season</i>	+	-0.018 (0.895)	-0.014 (0.919)
<i>Sales_Growth</i>	+	1.001*** (0.000)	1.055*** (0.000)
<i>CEO_Dual</i>	-	-0.325*** (0.002)	-0.333*** (0.002)
Year fixed effect		Yes	Yes
Industry fixed effect		Yes	Yes
R ²		14.99%	14.91%

auditors. The estimated coefficient of *Teamwork_Score* in Column 1 of Table 5 is positive and significant (0.235 with *p*-value < 0.001) whereas that in Column 2 is insignificant (0.179 with a *p*-value of 0.112), suggesting that the firms engaging Big 4 auditors are driving the results supporting H1.¹⁶ A possible reason for this result is that non-Big 4 auditors' clients are usually smaller in size, thus facilitating the cultivation of teamwork culture in these organizations. Conversely, Big 4 auditors' clients are usually larger in size with more operational and geographical segments (Lawrence et al., 2011); hence, it is harder for them to create a strong firm-wide teamwork culture. When such a culture has been developed deliberately, the dark side of teamwork may be more pronounced.

This finding could be of interest to audit practitioners, especially Big 4 accounting firms, as it exposes the potential risks associated with the dark side of teamwork culture that may prevail in some audit clients.

4.5. Cross-sectional test for small vs. large firms

Company size is highly correlated with fraudulent financial reporting (e.g., Fleming et al., 2016; Nor et al., 2010). Carcello and Nagy (2004b) assert that either due to the greater bargaining power that large companies have, or because it is harder to ascertain the accuracy of financial information of more complex firms,

¹⁶ An untabulated F-test shows that the coefficients of *Teamwork_Score* for the two sample subgroups (Big 4 vs. Non-Big 4) are significantly different.

auditors may have difficulty detecting potential fraud in their larger clients. In this additional test, we extend the prior literature by examining the influence of corporate teamwork culture on fraudulent financial reporting relative to company size.

Specifically, to test the joint effect of corporate teamwork culture and company size, we modify Eq. (3) by adding an interaction term of *Size* and *Teamwork_Score* and develop the model as below:

$$\begin{aligned}
 \text{Benford_Score} = & \beta + \beta_1 \text{Teamwork_Score} + \beta_2 \text{Size} \\
 & + \beta_3 \text{Teamwork_Score} \times \text{Size} \\
 & + \beta_4 \text{ROA} + \beta_5 \text{Big4} + \beta_6 \text{LEV} + \beta_7 \text{MTB} \\
 & + \beta_8 \text{INV} + \beta_9 \text{REC} \\
 & + \beta_{10} \text{Distress} + \beta_{11} \text{Foreign} + \beta_{12} \text{Special_Item} \\
 & + \beta_{13} \text{Busy_Season} \\
 & + \beta_{14} \text{Sales_Growth} + \beta_{15} \text{CEO_Dual} \\
 & + \text{Year and Industry Fixed Effects} + \varepsilon, \quad (4)
 \end{aligned}$$

where all the variables are defined as the same as those in Eq. (3).

Table 6a reports the regression results of Eq. (4). Consistent with the findings we obtain in the main hypothesis analysis, the estimated coefficient of *Teamwork_Score* (β_1) in Table 6a is positive and statistically significant (0.896 with *p*-value < 0.001), meaning that the more teamwork culture a company exhibits, the more risk of financial fraudulent reporting it has. The coefficient estimate of *Size* (β_2) is negative (-0.577 with *p*-value < 0.001), suggesting that a bigger firm size leads to less financial

Table 4a

Panel A: Multivariate analysis result for H2 (corporate teamwork culture and financial misconduct in the circumstance of effective/ineffective internal controls) based on *Teamwork_Score*.

Dependent variable = <i>Benford_Score</i>				
Independent variables	Expected sign	(1) Samples of Firms with <i>Ineffective</i> Internal Control Reported under SOX 302 Coefficients (<i>p</i> -values) n = 8269	(2) Samples of Firms with <i>Effective</i> Internal Control Reported under SOX 302 Coefficients (<i>p</i> -values) n = 37,719	F-statistics
Constant		36.376*** (0.000)	31.964*** (0.000)	
<i>Teamwork_Score</i>	+	0.204 (0.253)	0.246*** (0.000)	4.38*** (0.010)
<i>Size</i>	+/-	-0.780*** (0.000)	-0.807*** (0.000)	1.93 (0.141)
<i>ROA</i>	-	-4.242** (0.024)	-7.158*** (0.000)	1.91 (0.174)
<i>Big4</i>	-	0.997 (0.110)	0.044 (0.830)	2.19 (0.111)
<i>LEV</i>	+/-	-0.787 (0.578)	-0.978*** (0.005)	1.99 (0.136)
<i>MTB</i>	+	0.002 (0.963)	0.032*** (0.004)	1.99 (0.136)
<i>Inv</i>	-	1.343 (0.647)	-1.252 (0.135)	5.63*** (0.001)
<i>Rec</i>	-	3.365* (0.083)	-0.727 (0.260)	3.70** (0.025)
<i>Distress</i>	+/-	-0.714 (0.224)	-0.480*** (0.004)	1.73 (0.241)
<i>Foreign</i>	+/-	-2.934*** (0.000)	-1.961*** (0.000)	1.83 (0.190)
<i>Special_Item</i>	+/-	-3.720*** (0.000)	-2.541*** (0.000)	1.70 (0.221)
<i>Busy_Season</i>	+	0.044 (0.932)	0.060 (0.684)	2.24 (0.111)
<i>Sales_Growth</i>	+	1.872 (0.126)	1.069*** (0.000)	1.71 (0.221)
<i>CEO_Dual</i>	-	0.147 (0.725)	-0.310*** (0.007)	1.94 (0.145)
Year fixed effect		Yes	Yes	
Industry fixed effect		Yes	Yes	
R ²		19.07%	15.09%	

misconduct. Also, we note that $Teamwork_Score \times Size$ (β_3) is negative (-0.096 with p -value < 0.001). The result indicates that the interaction term of *Teamwork_Score* and *Size* is negatively associated with the propensity for a company to engage in financial misconduct. In sum, a smaller company with stronger teamwork culture is more likely to engage in financial reporting misconduct.

To confirm our assumption as above, built on the variable of *Teamwork_Rank* exploited in Eq. (3), we develop a model as below:

$$\begin{aligned}
 Benford_Score = & \gamma + \gamma_1 Teamwork_High_Rank + \gamma_2 Small_Size \\
 & + \gamma_3 Teamwork_High_Rank \times Small_Size \\
 & + \gamma_4 ROA + \gamma_5 Big4 \\
 & + \gamma_6 LEV + \gamma_7 MTB + \gamma_8 INV + \gamma_9 REC \\
 & + \gamma_{10} Distress + \gamma_{11} Foreign \\
 & + \gamma_{12} Special_Item + \gamma_{13} Busy_Season \\
 & + \gamma_{14} Sales_Growth \\
 & + \gamma_{15} CEO_Dual \\
 & + \text{Year and Industry Fixed Effects} + \varepsilon, \quad (5)
 \end{aligned}$$

where *Teamwork_High_Rank*, an indicator variable, equals 1 if a firm's *Teamwork_Rank* is above 2 (*Teamwork_Rank* is ranged from 1 to 4; a higher rank means a stronger teamwork culture), 0 otherwise. *Small_Size* is also an indicator variable, which equals 1 if a firm's *Size* (based on total assets) is above the median of all the observations in a certain year; 0 otherwise.

Table 6b exhibits the results of the test with Eq. (5). In the table, the estimated coefficient of $Teamwork_High_Rank \times Small_Size$ (γ_3) is positive and significant (1.336 with p -value < 0.001). This result shows that when a firm is strong in teamwork culture (i.e., $Teamwork_High_Rank = 1$) and is small in size (i.e., $Small_Size = 1$), the firm will have a higher propensity to engage in financial statement misconduct.

5. Robustness tests

In the main hypothesis test model of Eq. (3), we follow Amiram et al. (2015) and capture the propensity of firms to undertake fraudulent financial reporting with *Benford_Score*, a relatively new measure (Golden, 2021). In this robustness test, we replace the measure of fraudulent financial reporting with the M-Score (Beneish, 1999), which is widely used in forensic accounting and earnings manipulation research.¹⁷ The model for the robustness test based on M-Score is as below:

$$\begin{aligned}
 Logit(Fraud_Risk_M) = & \zeta + \zeta_1 Teamwork_Score + \zeta_2 Size \\
 & + \zeta_3 ROA + \zeta_4 Big4
 \end{aligned}$$

¹⁷ Other widely used measures of financial reporting fraud include Dechow F-Score, etc. Prior literature finds that both M-Score and F-Score are effective and efficient in detecting potential financial frauds (e.g., Aghghaleh et al., 2016). In the current study, we just show the robustness test result with Beneish M-Score as dependent variable. Untabulated test shows consistent result of when using F-Score to capture financial fraud risk.

Table 4b
 Panel B: Multivariate analysis result for H2 (corporate teamwork culture and financial misconduct in the circumstance of effective/ineffective internal controls) based on *Teamwork_Rank*.

Dependent variable = <i>Benford_Score</i>				
Independent variables	Expected sign	(1) Samples of Firms with <i>Ineffective</i> Internal Control Reported under SOX 302 Coefficients (<i>p</i> -values) n = 8269	(2) Samples of Firms with <i>Effective</i> Internal Control Reported under SOX 302 Coefficients (<i>p</i> -values) n = 37,719	F-statistics
Constant		36.784*** (0.000)	32.284*** (0.000)	
<i>Teamwork_Rank</i>	+	0.086 (0.680)	0.141*** (0.009)	3.74** (0.024)
<i>Size</i>	+/-	-0.802*** (0.000)	-0.819*** (0.000)	1.96 (0.144)
<i>ROA</i>	-	-4.480** (0.019)	-7.568*** (0.000)	1.04 (0.354)
<i>Big4</i>	-	1.011 (0.104)	0.068 (0.739)	2.21 (0.110)
<i>LEV</i>	+/-	-0.903 (0.519)	-1.084*** (0.002)	2.04 (0.130)
<i>MTB</i>	+	0.003 (0.944)	0.034*** (0.002)	2.06 (0.127)
<i>Inv</i>	-	1.041 (0.723)	-1.614* (0.054)	5.70*** (0.003)
<i>Rec</i>	-	3.212* (0.098)	-0.891 (0.167)	3.73** (0.024)
<i>Distress</i>	+/-	-0.684 (0.241)	-0.472*** (0.004)	1.38 (0.223)
<i>Foreign</i>	+/-	-2.921*** (0.000)	-1.965*** (0.000)	1.44 (0.205)
<i>Special_Item</i>	+/-	-3.711*** (0.000)	-2.552*** (0.000)	1.65 (0.169)
<i>Busy_Season</i>	+	0.045 (0.932)	0.066 (0.656)	2.30 (0.100)
<i>Sales_Growth</i>	+	-1.847 (0.128)	1.135*** (0.000)	1.87 (0.192)
<i>CEO_Dual</i>	-	0.112 (0.789)	-0.317*** (0.006)	1.13 (0.318)
Year fixed effect		Yes	Yes	
Industry fixed effect		Yes	Yes	
R ²		19.01%	15.01%	

$$\begin{aligned}
 &+ \zeta_5 LEV + \zeta_6 MTB + \zeta_7 INV + \zeta_8 REC \\
 &+ \zeta_9 Distress + \zeta_{10} Foreign \\
 &+ \zeta_{11} Special_Item + \zeta_{12} Busy_Season \\
 &+ \zeta_{13} Sales_Growth \\
 &+ \zeta_{14} CEO_Dual \\
 &+ \text{Year and Industry Fixed Effects} + \varepsilon,
 \end{aligned}
 \tag{6}$$

where the dependent variable *Fraud_Risk_M* equals 1 if a firm is identified as risky in conducting financial fraud or manipulating financial data determined from its M-Score. More specifically, we follow Beneish and Nichols (2009) to obtain the numerical value of the M-Score, and then consider all firms with a Beneish M-Score larger than -1.78 risky (Beneish and Vorst, 2021). The independent variables included in Eq. (6) are defined the same as those in Eq. (3).

Table 7 reports the results of the robustness test of Eq. (6). In the table, the estimated coefficient of *Teamwork_Score* is positive and statistically significant (0.125 with *p*-value < 0.001). This result confirms our finding in the main hypothesis test that when a firm exhibits a stronger teamwork corporate culture, it is more likely to have the risk of financial statement fraud.

There is a concern that the measure of financial fraud risk based on either Benford's Law or Beneish M-Score can only suggest a likelihood but not true detection of known financial statement fraud (Nigrini, 2012). To further enhance the conclusion validity of our findings, we perform another robustness test by

exploiting a propensity score matching (PSM) model. Specifically, following Zhang et al. (2020) and Dyck et al. (2010), we construct a sample pool with all the identified firms (cases) of financial statement misconduct between 2003 and 2021 and then match these firm-year observations with the observations having no financial fraud issues by leveraging PSM.¹⁸ As suggested in prior forensic accounting literature (e.g., Liu et al., 2021), our PSM process matches the samples of identified frauds with the samples of non-fraud based on company size (*Size*), market growth pressure (*MTB*), profitability (*ROA*), and global footprint (*Foreign*). We then adopt a logistic regression to finish the robustness test as shown below:

$$\begin{aligned}
 \text{Logit}(\text{Fraud_Law}) = & \delta + \delta_1 \text{Teamwork_High_Rank} + \delta_2 \text{Size} \\
 & + \delta_3 \text{ROA} + \delta_4 \text{Big4} \\
 & + \delta_5 \text{LEV} + \delta_6 \text{MTB} + \delta_7 \text{INV} + \delta_8 \text{REC} \\
 & + \delta_9 \text{Distress} + \delta_{10} \text{Foreign} \\
 & + \delta_{11} \text{Special_Item} + \delta_{12} \text{Busy_Season} \\
 & + \delta_{13} \text{Sales_Growth}
 \end{aligned}$$

¹⁸ The data of financial fraud cases are publicly available in the repository of Stanford Securities Class Action Clearinghouse (SSCAC). We manually adjust the data with the information disclosed on the website of the U.S. Department of Justice (DOJ) (<https://www.justice.gov/criminal-fraud>) and the SEC AAER section (<https://www.sec.gov/divisions/enforce/friactions.htm>). For example, we only keep the cases which are at firm-level but not individual-level. To avoid double counting, when a firm has been sued by both DOJ and SEC, we only count that case once.

Table 5
Result of additional test 1 (Big 4 vs. non-Big 4 clients).

Dependent variable = <i>Benford_Score</i>			
Independent variables	Expected sign	(1) Samples of Firms Hiring Big 4 Auditors Coefficients (<i>p</i> -values) n = 40,148	(2) Samples of Firms Hiring Non-Big 4 Auditors Coefficients (<i>p</i> -values) n = 5840
Constant		32.390*** (0.000)	31.285*** (0.000)
<i>Teamwork_Score</i>	+	0.235*** (0.000)	0.179 (0.112)
<i>Size</i>	+/-	-0.787*** (0.000)	-0.983*** (0.000)
<i>ROA</i>	-	-7.120*** (0.000)	-4.543*** (0.000)
<i>LEV</i>	+/-	-1.427*** (0.000)	0.417 (0.614)
<i>MTB</i>	+	0.030*** (0.005)	0.009 (0.795)
<i>Inv</i>	-	-0.312 (0.695)	-3.700* (0.095)
<i>Rec</i>	-	-0.921 (0.150)	0.717 (0.616)
<i>Distress</i>	+/-	-0.436*** (0.007)	-0.755* (0.067)
<i>Foreign</i>	+/-	-1.981*** (0.000)	-1.551*** (0.000)
<i>Special_Item</i>	+/-	-2.415*** (0.000)	-3.456*** (0.000)
<i>Busy_Season</i>	+	0.063 (0.660)	-0.537 (0.177)
<i>Sales_Growth</i>	+	1.215*** (0.000)	-0.008 (0.986)
<i>CEO_Dual</i>	-	-0.309*** (0.007)	-0.435 (0.146)
Year fixed effect		Yes	Yes
Industry fixed effect		Yes	Yes
R ²		14.91%	13.59%

$$+ \delta_{14} \text{CEO_Dual} + \text{Year and Industry Fixed Effects} + \varepsilon, \quad (7)$$

where the variable of *Fraud_Law* equals 1 if a firm's financial statement fraud occurred in a certain fiscal year and subsequently sued, 0 otherwise.

The robustness test result with Eq. (7) is in Table 8. We find that the estimated coefficient of *Teamwork_High_Rank* is positive and statistically significant (0.473 with a *p*-value of 0.032). This result suggests that firms with stronger teamwork cultures are more likely to be involved in accounting or financial statement misconduct, and later caught. Because the dependent variable we use in this robustness test, *Fraud_Law*, reflects the identified/confirmed cases of financial statement fraud, not the predicted likelihood, the conclusion drawn upon the outcomes of the Eq. (7) test is reliable. Thus, the results generated from both robustness tests support our conclusion in the main analysis for our main hypothesis (H1).

6. Conclusion

Corporate culture is important in a firm's operational and financial performance (e.g., Guiso et al., 2015; Bhandari et al., 2022); it is worthwhile to explore more about how corporate culture affects business outcomes, whether positive or negative. In this study, we examine the influence of corporate teamwork culture on financial statement misconduct, which extends prior literature by identifying that corporate teamwork culture has a dark side that may provide the incentive and rationalization for the recruitment of accounting and finance personnel to be complicit or participate in financial statement misconduct.

We empirically demonstrate that stronger teamwork culture is associated with higher propensity for financial statement misconduct in a company. This effect is more pronounced in firms using Big 4 auditors. Moreover, for firms that are smaller in size, a strong teamwork culture may be more detrimental to financial reporting integrity. However, our results also show that when there is an internal control problem disclosed publicly, the possible negative impact of teamwork culture on financial misconduct is mitigated, meaning that companies appear to know when and how to conceal unethical behaviors.

This research exposes a dark side of teamwork culture as a catalyst for financial statement misconduct. The results may be of interest to those with corporate governance responsibilities to shape internal discussions about the confluence of ethics and corporate values. Additionally, these findings may be helpful to shareholders. With the insights offered by the current study, investors could have a more complete picture before making investment decisions by considering corporate culture in a dialectical way. Our study could also be of interest to audit practitioners, especially Big 4 auditors. As risk control is critical in audit engagements (Allen et al., 2006), our findings provide auditors with a unique perspective to assess collusive financial statement misconduct risk.

Our study is not without limitations. As with most archival studies, we are only able to empirically demonstrate an association between our variables of interest and the dependent variables, but not the causal relationship between the dependent and independent variables. Hence, we suggest readers interpret our multivariate regression results with caution. Also, because our measure of corporate teamwork culture is based on textual analysis of firms' earnings call transcripts, we note inherent issues

Table 6a
Panel A: Result of additional test 2 based on firm size.

Dependent variable = <i>Benford_Score</i>		
Independent variables	Expected sign	Full sample Coefficients (p-values) n = 45,988
Constant		30.882*** (0.000)
<i>Teamwork_Score</i>	+	0.896*** (0.000)
<i>Size</i>	+/-	-0.577*** (0.000)
<i>Teamwork_Score</i> × <i>Size</i>	?	-0.096*** (0.000)
ROA	-	-6.260*** (0.000)
<i>Big4</i>	-	0.070 (0.703)
<i>LEV</i>	+/-	-1.060*** (0.001)
<i>MTB</i>	+	0.028*** (0.006)
<i>Inv</i>	-	-0.820 (0.288)
<i>Rec</i>	-	-0.630 (0.286)
<i>Distress</i>	+/-	-0.473*** (0.002)
<i>Foreign</i>	+/-	-1.912*** (0.000)
<i>Special_Item</i>	+/-	-2.584*** (0.000)
<i>Busy_Season</i>	+	-0.024 (0.861)
<i>Sales_Growth</i>	+	1.007*** (0.000)
<i>CEO_Dual</i>	-	-0.336*** (0.002)
Year fixed effect		Yes
Industry fixed effect		Yes
R ²		15.07%

Table 6b
Panel B: Result of additional test 2 based on firms of smaller vs. larger sizes.

Dependent variable = <i>Benford_Score</i>		
Independent variables	Expected sign	Full sample Coefficients (p-values) n = 45,988
Constant		26.948*** (0.000)
<i>Teamwork_High_Rank</i>	+	0.155 (0.429)
<i>Small_Size</i>	?	1.459*** (0.000)
<i>Teamwork_High_Rank</i> × <i>Small_Size</i>	?	1.336*** (0.000)
ROA	-	-8.009*** (0.000)
<i>Big4</i>	-	-0.448** (0.014)
<i>LEV</i>	+/-	-1.447*** (0.000)
<i>MTB</i>	+	0.030*** (0.003)
<i>Inv</i>	-	-0.442 (0.562)
<i>Rec</i>	-	-0.320 (0.584)
<i>Distress</i>	+/-	-0.450*** (0.003)

Table 6b (continued).
Dependent variable = *Benford_Score*

Independent variables	Expected sign	Full sample Coefficients (p-values) n = 45,988
<i>Foreign</i>	+/-	-2.206*** (0.000)
<i>Special_Item</i>	+/-	-2.791*** (0.000)
<i>Busy_Season</i>	+	0.001 (0.995)
<i>Sales_Growth</i>	+	1.075*** (0.000)
<i>CEO_Dual</i>	-	-0.463*** (0.000)
Year fixed effect		Yes
Industry fixed effect		Yes
R ²		14.21%

Table 7
Result of robustness test 1 (measuring financial fraud/misconduct risk with Beneish M-score).

Dependent variable = $\text{Logit}(\text{Fraud_Risk_M} = 1 \mid \text{Beneish_Mscore} > -1.78)$		
Independent variables	Expected sign	Full sample Coefficients (p-values) n = 45,988
Constant		-0.913 (0.304)
<i>Teamwork_Score</i>	+	0.125*** (0.000)
<i>Size</i>	+/-	0.148*** (0.000)
ROA	-	-0.449** (0.025)
<i>Big4</i>	-	-0.096 (0.258)
<i>LEV</i>	+/-	-0.333** (0.036)
<i>MTB</i>	+	0.001 (0.834)
<i>Inv</i>	-	-0.171 (0.634)
<i>Rec</i>	-	0.524 (0.199)
<i>Distress</i>	+/-	0.113 (0.121)
<i>Foreign</i>	+/-	-0.603*** (0.000)
<i>Special_Item</i>	+/-	-0.321*** (0.000)
<i>Busy_Season</i>	+	0.093 (0.184)
<i>Sales_Growth</i>	+	1.610*** (0.000)
<i>CEO_Dual</i>	-	-0.089* (0.072)
Year fixed effect		Yes
Industry fixed effect		Yes
Pseudo R ²		26.32%

of this method (e.g., language ambiguity judgments) might affect construct validity (Loughran and McDonald, 2016). Lastly, we only include U.S. firms in our study; as such, our results may not be generalizable to other country-level cultures. To extend this paper, other researchers may try to identify the tone from the top and/or communication that occurs in high teamwork environments that mitigates or exacerbates an individual's tendency to be complicit or participate in financial statement misconduct. Future research may also contribute to the international accounting literature by examining the impacts of corporate teamwork culture on financial statement outside the U.S.

Table 8

Robustness test 2 (matching firms having identified financial fraud with firms having no fraud based on propensity score matching).

Dependent variable = $\text{Logit}(\text{Fraud_Law} = 1 \text{ if a firm is sued for financial/accounting fraud in a fiscal year})$		
Independent variables	PSM sample Coefficients n = 10,013	(p-values)
Constant	-10.557***	(0.000)
Teamwork_High_Rank	0.473**	(0.032)
Size	0.569***	(0.000)
ROA	-0.580	(0.792)
Big4	0.587	(0.596)
LEV	0.304	(0.812)
MTB	-0.050	(0.204)
Inv	6.599*	(0.076)
Rec	2.084	(0.108)
Distress	0.619	(0.189)
Foreign	-0.34	(0.627)
Special_Item	0.103	(0.861)
Busy_Season	-0.478	(0.345)
Sales_Growth	-1.514	(0.409)
CEO_Dual	0.342	(0.466)
Year fixed effect	Yes	
Industry fixed effect	Yes	
Pseudo R ²	16.58%	

We attempted to test the joint effect of other cultural values on financial statement misconduct. For example, based on the measure suggested in Li et al. (2021), we investigated the impact of corporate teamwork culture on financial statement misconduct alongside corporate integrity culture. We do not find any statistically significant results. This could be caused by various reasons such as potential correlation (endogeneity) issues between the two cultural values. Future studies may provide more insights in these areas.

CRedit authorship contribution statement

Chenyong Liu: Conceptualization, Methodology, Software, Data curation, Writing – original draft, Writing – review & editing. **David Ryan:** Conceptualization, Writing – original draft, Writing – review & editing. **Guoyu Lin:** Methodology, Writing – review & editing. **Chunhao Xu:** Resources, Writing – review & editing.

Appendix. Variable definitions

<i>Benford_Score</i>	The Benford's Score is calculated by following Amiram et al. (2015) and multiplied by 1000.
<i>Big4</i>	Indicator variable coded 1 if a firm hires Big four accounting firms (i.e., PwC, Deloitte, EY, and KPMG) in a fiscal year (Compustat <i>AU</i> = 4/5/6/7), 0 otherwise.
<i>Busy_Season</i>	Indicator variable coded 1 if a firm's fiscal year-end is the last day of December, 0 otherwise.
<i>CEO_Dual</i>	Indicator variable coded 1 if a company's CEO also serves as board chair, 0 otherwise (data from BoardEx North America).

<i>Distress</i>	Indicator variable coded 1 if a company is financially distressed (i.e., Altman Z-Score < 1.8), 0 otherwise.
<i>Foreign</i>	Indicator variable coded 1 if a company has foreign income (i.e., Compustat <i>PIFO</i> > 0) during a certain fiscal year, 0 otherwise.
<i>Fraud_Law</i>	Indicator variable coded as 1 if a firm involved in financial fraud/accounting misconduct issues in a fiscal year and has been sued later; 0 otherwise.
<i>Fraud_Risk_M</i>	Indicator variable coded as 1 if a firm is identified to have financial trouble and has risks in committing financial fraud (i.e., Beneish M-Score > -1.78), 0 otherwise.
<i>INV</i>	Inventory (Compustat <i>INVT</i>) scaled by total assets (Compustat <i>AT</i>).
<i>LEV</i>	Total long-term debt (Compustat <i>DLTT</i>) scaled by total assets.
<i>MTB</i>	Market-to-book ratio equals to be the market value of common equity (Compustat <i>PRCC_F</i> × <i>CSHO</i>) divided by the book value of common equity (Compustat <i>CEQ</i>)
<i>REC</i>	Accounts receivable (Compustat <i>RECT</i>) scaled by total assets.
<i>ROA</i>	Income before extraordinary items (Compustat <i>IB</i>) scaled by total assets.
<i>Sales_Growth</i>	The increase of sales revenue (Compustat <i>Sale</i>) of a company in a certain fiscal year.
<i>Size</i>	The natural logarithm value of total assets.
<i>Small_Size</i>	Indicator variable coded as 1 if a firm has its <i>Size</i> below the size median of all observations, 0 otherwise.
<i>Special_Item</i>	Indicator variable coded 1 if a company has a special item transaction (Compustat <i>SPI</i>) reported in the financial statement, 0 otherwise.
<i>Teamwork_Score</i>	A continuous variable is used to measure corporate teamwork culture following Li et al. (2021).
<i>Teamwork_Rank</i>	Discrete variable with the lowest value of 1 and highest value of 4 based on which percentile range a firm's <i>Teamwork_Score</i> is in. A larger numerical value of <i>Teamwork_Rank</i> stands for more teamwork culture exhibited. More specifically, all observations' <i>Teamwork_Score</i> from 2003 to 2021 are ranked into four groups, and samples in the highest group (i.e., observations with <i>Teamwork_Score</i> above the top 25-percentile) have <i>Teamwork_Rank</i> as 4.
<i>Teamwork_High_Rank</i>	Indicator variable coded as 1 if a firm has its <i>Teamwork_Rank</i> larger than 2 (i.e., above the median), and 0 otherwise.

References

- Abbott, L.J., Park, Y., Parker, S., 2000. The effects of audit committee activity and independence on corporate fraud. *Manag. Finance* 26 (11), 55–68.
- Aghghaleh, S.F., Mohamed, Z.M., Rahmat, M.M., 2016. Detecting financial statement frauds in Malaysia: Comparing the abilities of beneish and dechow models. *Asian J. Account. Gov.* 7.
- Albrecht, C., Holland, D., Malagueño, R., Dolan, S., Tzafir, S., 2015. The role of power in financial statement fraud schemes. *J. Bus. Ethics* 131 (4), 803–813.
- Allen, R.D., Hermanson, D.R., Kozloski, T.M., Ramsay, R.J., 2006. Auditor risk assessment: Insights from the academic literature. *Account. Horiz.* 20 (2), 157–177.
- Altman, E.I., 2018. A fifty-year retrospective on credit risk models, the altman Z-score family of models and their applications to financial markets and managerial strategies. *J. Credit Risk* 14 (4).
- Amiram, D., Bozanic, Z., Cox, J.D., Dupont, Q., Karpoff, J.M., Sloan, R., 2018. Financial reporting fraud and other forms of misconduct: A multidisciplinary review of the literature. *Rev. Account. Stud.* 23 (2), 732–783.
- Amiram, D., Bozanic, Z., Rouen, E., 2015. Financial statement errors: Evidence from the distributional properties of financial statement numbers. *Rev. Account. Stud.* 20 (4), 1540–1593.
- Anand, V., Tina Dacin, M., Murphy, P.R., 2015. The continued need for diversity in fraud research. *J. Bus. Ethics* 131 (4), 751–755.
- Beneish, M.D., 1997. Detecting GAAP violation: Implications for assessing earnings management among firms with extreme financial performance. *J. Account. Public Policy* 16 (3), 271–309.
- Beneish, M.D., 1999. The detection of earnings manipulation. *Financ. Anal. J.* 55 (5), 24–36.
- Beneish, M.D., Nichols, C., 2009. Identifying overvalued equity. In: Johnson School Research Paper Series, (09-09).
- Beneish, M.D., Vorst, P., 2021. The Cost of Fraud Prediction Errors. Kelley School of Business Research Paper, (2020-55).
- Benford, F., 1938. The law of anomalous numbers. *Proc. Am. Phil. Soc.* 55, 1–572.
- Bentley, K.A., Omer, T.C., Sharp, N.Y., 2013. Business strategy, financial reporting irregularities, and audit effort. *Contemp. Account. Res.* 30 (2), 780–817.
- Bhandari, A., Mammadov, B., Thevenot, M., Vakilzadeh, H., 2022. Corporate culture and financial reporting quality. *Account. Horiz.* 36 (1), 1–24.
- Biggerstaff, L., Cicero, D.C., Puckett, A., 2015. Suspect CEOs, unethical culture, and corporate misbehavior. *J. Financ. Econ.* 117 (1), 98–121.
- Bishop, C.C., Hermanson, D.R., Riley, Jr., R.A., 2017. Collusive fraud: Leader, incident, and organizational characteristics. *J. Forensic Account. Res.* 2 (1), A49–A70.
- Brazel, J.F., Jones, K.L., Zimbleman, M.F., 2009. Using nonfinancial measures to assess fraud risk. *J. Account. Res.* 47 (5), 1135–1166.
- Carcello, J.V., Nagy, A.L., 2004a. Client size, auditor specialization and fraudulent financial reporting. *Manag. Audit. J.* 19 (5), 651–668.
- Carcello, J.V., Nagy, A.L., 2004b. Audit firm tenure and fraudulent financial reporting. *Audit. J. Pract. Theory* 23 (2), 55–69.
- Chakrabarty, B., Duellman, S., Hyman, M.A., 2020. A new approach to estimating the relation between audit fees and financial misconduct. *Account. Horiz.* 34 (2), 41–61.
- Cressey, 1973. *Other People's Money; A Study in the Social Psychology of Embezzlement*. Patterson Smith.
- Da Silva, C.G., Carreira, P.M., 2013. Selecting audit samples using benford's law. *Audit. J. Pract. Theory* 32 (2), 53–65.
- Dalnial, H., Kamaluddin, A., Sanusi, Z.M., Khairuddin, K.S., 2014. Detecting fraudulent financial reporting through financial statement analysis. *J. Adv. Manag. Sci.* 2 (1).
- Davis, J.S., Pesch, H.L., 2013. Fraud dynamics and controls in organizations. *Account. Organ. Soc.* 38 (6–7), 469–483.
- Dechow, P.M., Ge, W., Larson, C.R., Sloan, R.G., 2011. Predicting material accounting misstatements. *Contemp. Account. Res.* 28 (1), 17–82.
- Dechow, P., Ge, W., Schrand, C., 2010. Understanding earnings quality: A review of the proxies, their determinants and their consequences. *J. Account. Econ.* 50 (2–3), 344–401.
- Dhaliwal, D., Hogan, C., Trezevant, R., Wilkins, M., 2011. Internal control disclosures, monitoring, and the cost of debt. *Account. Rev.* 86 (4), 1131–1156.
- Donelson, D.C., Ege, M.S., McInnis, J.M., 2017. Internal control weaknesses and financial reporting fraud. *Audit. J. Pract. Theory* 36 (3), 45–69.
- Durtschi, C., Hillison, W., Pacini, C., 2004. The effective use of benford's law to assist in detecting fraud in accounting data. *J. Forensic Account.* 5 (1), 17–34.
- Dyck, A., Morse, A., Zingales, L., 2010. Who blows the whistle on corporate fraud? *J. Finance* 65 (6), 2213–2253.
- Feng, M., Li, C., McVay, S., 2009. Internal control and management guidance. *J. Account. Econ.* 48 (2–3), 190–209.
- Fleming, A.S., Hermanson, D.R., Kranacher, M.J., Riley, Jr., R.A., 2016. Financial reporting fraud: Public and private companies. *J. Forensic Account. Res.* 1 (1), A27–A41.
- Free, C., Murphy, P.R., 2015. The ties that bind: The decision to co-offend in fraud. *Contemp. Account. Res.* 32 (1), 18–54.
- Frydman, C., Jenter, D., 2010. CEO compensation. *Annu. Rev. Financ. Econ.* 2 (1), 75–102.
- Ge, W., McVay, S., 2005. The disclosure of material weaknesses in internal control after the Sarbanes-Oxley Act. *Account. Horiz.* 19 (3), 137–158.
- Goebel, S., Weißenberger, B.E., 2017. The relationship between informal controls, ethical work climates, and organizational performance. *J. Bus. Ethics* 141 (3), 505–528.
- Golden, J., 2021. Local crime environment and corporate financial misconduct using benford's law. *J. Forensic Account. Res.* 6 (1), 436–460.
- Graham, J.R., Harvey, C.R., Popadak, J., Rajgopal, S., 2017. *Corporate Culture: Evidence from the Field* (No. W23255). National Bureau of Economic Research.
- Groysberg, B., Lee, J., Price, J., Cheng, J., 2018. The leader's guide to corporate culture. *Harv. Bus. Rev.* 96 (1), 44–52.
- Guiso, L., Sapienza, P., Zingales, L., 2015. The value of corporate culture. *J. Financ. Econ.* 117 (1), 60–76.
- Gul, F.A., Ma, S.M., Lai, K., 2017. Busy auditors, partner-client tenure, and audit quality: Evidence from an emerging market. *J. Int. Account. Res.* 16 (1), 83–105.
- Hill, T.P., 1995. A statistical derivation of the significant-digit law. *Statist. Sci.* 35, 4–363.
- Jollineau, S.J., Vance, T.W., Webb, A., 2012. Subordinates as the first line of defense against biased financial reporting. *J. Manage. Account. Res.* 24 (1), 1–24.
- Khlif, H., 2016. Hofstede's cultural dimensions in accounting research: A review. *Meditari Account. Res.* 24 (4), 545–573.
- Khurana, I.K., Raman, K.K., 2004. Litigation risk and the financial reporting credibility of big 4 versus non-big 4 audits: Evidence from anglo-American countries. *Account. Rev.* 79 (2), 473–495.
- Krause, R., Semadeni, M., Cannella Jr., A.A., 2014. CEO duality: A review and research agenda. *J. Manage.* 40 (1), 256–286.
- Kulik, B.W., 2005. Agency theory, reasoning and culture at enron: In search of a solution. *J. Bus. Ethics* 59 (4), 347–360.
- Lawrence, A., Minutti-Meza, M., Zhang, P., 2011. Can big 4 versus non-big 4 differences in audit-quality proxies be attributed to client characteristics? *Account. Rev.* 86 (1), 259–286.
- Lee, J., 2016. Can investors detect managers' lack of spontaneity? Adherence to predetermined scripts during earnings conference calls. *Account. Rev.* 91 (1), 229–250.
- Li, K., Mai, F., Shen, R., Yan, X., 2021. Measuring corporate culture using machine learning. *Rev. Financ. Stud.* 34 (7), 3265–3315.
- Liu, X., 2016. Corruption culture and corporate misconduct. *J. Financ. Econ.* 122 (2), 307–327.
- Liu, C., Xu, C., Liu, Z., 2021. To control or to compromise? The prominence of chief compliance officer and foreign corrupt practices act violation. *J. Corp. Account. Finance* 32 (2), 114–128.
- Lopez, D.M., Peters, G.F., 2012. The effect of workload compression on audit quality. *Audit. J. Pract. Theory* 31 (4), 139–165.
- Loughran, T., McDonald, B., 2011. When is a liability not a liability? Textual analysis, dictionaries, and 10-ks. *J. Finance* 66 (1), 35–65.
- Loughran, T., McDonald, B., 2016. Textual analysis in accounting and finance: A survey. *J. Account. Res.* 54 (4), 1187–1230.
- Lowe, D.J., Pope, K.R., Samuels, J.A., 2015. An examination of financial sub-certification and timing of fraud discovery on employee whistleblowing reporting intentions. *J. Bus. Ethics* 131 (4), 757–772.
- Mahama, M., 2015. Detecting corporate fraud and financial distress using the Altman and Beneish models. *Int. J. Econ. Commer. Manage.* 3 (1), 1–18.
- McVay, S.E., 2006. Earnings management using classification shifting: An examination of core earnings and special items. *Account. Rev.* 81 (3), 501–531.
- Nigrini, M.J., 2000. *Digital Analysis using Benford's Law: Tests & Statistics for Auditors*. Global Audit Publications, A Division of ACL Services Ltd, Vancouver, Canada.
- Nigrini, M.J., 2012. *Benford's Law: Applications for Forensic Accounting, Auditing, and Fraud Detection*, Vol. 586. John Wiley & Sons.
- Nor, J.M., Ahmad, N., Saleh, N.M., 2010. Fraudulent financial reporting and company characteristics: Tax audit evidence. *J. Financial Report. Account.* 8 (2), 128–142.
- Oosthuizen, H., De Lange, P., Wilmshurst, T., Beatson, N., 2021. Teamwork in the accounting curriculum: Stakeholder expectations, accounting students' value proposition, and instructors' guidance. *Account. Educ.* 30 (2), 131–158.
- O'Reilly, C.A., Chatman, J.A., 1996. Culture as social control: Corporations, cults, and commitment. *Res. Organ. Behav. Annu. Ser. Anal. Essays Crit. Rev.* 18, 157–200.
- Reno, R.R., Cialdini, R.B., Kallgren, C.A., 1993. The transsituational influence of social norms. *J. Personal. Soc. Psychol.* 64 (1), 104.
- Reurink, A., 2018. Financial fraud: A literature review. *J. Econ. Surv.* 32 (5), 1292–1325.

- Scharff, M.M., 2005. Understanding WorldCom's accounting fraud: Did groupthink play a role? *J. Leadersh. Organ. Stud.* 11 (3), 109–118.
- Schneider, A., Gramling, A.A., Hermanson, D.R., Ye, Z.S., 2009. A review of academic literature on internal control reporting under SOX. *J. Account. Lit.* 28 (1).
- Simha, A., Satyanarayan, S., 2016. Straight from the horse's mouth: Auditors' on fraud detection and prevention, roles of technology, and white-collars getting splattered with red!. *J. Account. Finance* 16 (1), 26–44.
- Singh, J., 2008. Impostors masquerading as leaders: Can the contagion be contained? *J. Bus. Ethics* 82 (3), 733–745.
- Tillman, R., 2009. Reputations and corporate malfeasance: Collusive networks in financial statement fraud. *Crime, Law Soc. Chang.* 51 (3), 365–382.
- Tripathy, M., 2018. Building quality teamwork to achieve excellence in business organizations. *Int. Res. J. Manag. IT Soc. Sci.* 5 (3), 1–7.
- Van Driel, H., 2018. Financial fraud, scandals, and regulation: A conceptual framework and literature review. *Bus. Hist.* 61 (8), 1259–1299.
- Velte, P., 2021. The link between corporate governance and corporate financial misconduct. A review of archival studies and implications for future research. *Manag. Rev. Q.* 1–59.
- West, S.G., Aiken, L.S., Krull, J.L., 1996. Experimental personality designs: Analyzing categorical by continuous variable interactions. *J. Pers.* 64 (1), 1–48.
- White, D.W., Lean, E., 2008. The impact of perceived leader integrity on subordinates in a work team environment. *J. Bus. Ethics* 81 (4), 765–778.
- Wolfe, Hermanson, D.R., 2004. The fraud diamond: Considering the four elements of fraud. *CPA J.* 74 (12), 38.
- Zhang, J., Wang, J., Kong, D., 2020. Employee treatment and corporate fraud. *Econ. Model.* 85, 325–334.