

Does social exchange relationship impair audit committee effectiveness?

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Abstract This research applies the three-tier agency theory and social exchange theory to study the role of audit committees in improving financial reporting quality and reducing the likelihood of earnings restatements. Utilizing a matched sample of restated and non-restated U.S. listed firms between 2002 and 2005, this paper finds that firms with a larger proportion of audit committee members appointed after the CEO are associated with higher incidences of restatements, while the presence of an all-independent nomination committee is associated with a lower likelihood of restatements. The paper also shows that firms whose audit committee members have longer average tenure and receive higher director compensation are associated with a smaller likelihood of restatements. Finally, the paper documents changes in the impact of audit committee characteristics on financial restatements after the enactment of the Sarbanes–Oxley Act. Overall, our results suggest that audit committees’ effectiveness in supervising financial reporting quality is affected by social exchange processes and the broad social context.

Keywords Audit committee · Financial restatement · Three-tier agency theory · Social exchange · Behavioral theory of corporate governance

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1 Introduction

The accuracy and credibility of financial reports issued by listed firms are crucial for an efficient and viable stock market. Unfortunately, accounting fraud and other financial market misconduct are prevalent in the global market, and have seriously damaged interests of shareholders around the world (Cumming et al. 2015; Greve et al. 2010). Dyck et al. (2010) for example estimate that up to 14% of U.S. firms may engage in fraudulent activities. This ratio is even higher in developing economies with less stringent regulatory environment (e.g., Gabbioneta et al. 2013; Firth et al. 2011). The 2016 Global Fraud Study reports that a typical organization loses approximately 5% of its annual revenues to financial misconduct each year, which amounts to hundreds of billions in lost value globally.¹ Apart from causing significant investment loss, fraudulent financial reporting also constitutes a direct breach of stakeholders' trust, thus represents an ethical failure of corporate managers to perform their fiduciary duties to investors (Kaplan 2001; Staubus 2005).

To prevent financial misconduct and to improve investor confidence, governments around the world have implemented a series of reforms to strengthen internal and external corporate governance mechanisms. Many of these regulatory changes have focused on the composition of an audit committee, a board sub-committee in charge of overseeing a firm's financial reporting process, internal control structure, internal audit functions, and external audit services. In the U.S., both the New York Stock Exchange (NYSE) and the National Association of Securities Dealers Automated Quotations (NASDAQ) started requiring publicly traded firms to maintain an audit committee with at least three outside directors in 1999. The Sarbanes–Oxley Act (SOX) of 2002 further specifies that an audit committee in a listed company should consist entirely of independent directors. In addition, each member of the audit committee must be financially literate with at least one being a financial expert. These requirements were subsequently incorporated by both stock exchanges in their listing requirements (Linck et al. 2009). The underlying rationale of these reforms could be summarized in a statement of Arthur Levitt (1999), the former chairman of Securities and Exchange Commission (SEC) in the U.S., that “Qualified, committed, independent, and tough-minded audit committees represent the most reliable guardians of the public interest.”

However, as Agrawal and Chadha (2005) point out, “there is no systematic empirical evidence on the effectiveness of these governance provisions in avoiding serious accounting problems at companies”. Carcello et al. (2011) likewise suggest that SOX provisions on audit committee independency are not equally effective in all listed firms and are often compromised by organizational contingencies particularly the CEO's involvement in board selection processes. The primary objective of this paper therefore is to examine factors affecting the effectiveness of audit committees in assuring financial reporting quality and reducing the occurrence of financial restatements in the post-SOX era to explore whether more stringent

¹ Association of Certified Fraud Examiner: Accessed from <http://www.acfe.com/rtn2016.aspx>.

corporate governance regulations indeed strengthen functions and authority of listed firms' audit committees beyond bringing symbolic changes to their structure.

Extant studies on audit committees are mostly built on agency theory to examine the committee's role in mitigating managerial opportunism arising from the separation of ownership and control (Fama 1980; Fama and Jensen 1983; Jensen and Meckling 1976). The standard agency model posits a risk-neutral principal (shareholders) who delegates jobs to a risk-averse agent (management). Moral hazard occurs when managers act to gain private interests at the cost of shareholders, e.g., by manipulating or misreporting financial statements. A major task of shareholders therefore is to implement effective corporate governance mechanisms to monitor managerial activities or grant management incentives to align their interest with those of shareholders (Hermalin and Weisbach 1997; Jensen and Murphy 1990). Consequently, audit committees with certain characteristics are argued to be able to provide higher quality monitoring to reduce information asymmetry, improve financial reporting quality, and ultimately decrease the probability of accounting fraud and misreporting as manifested in financial restatements. For example, the incidence of financial restatements is found to be lower at the presence of an audit committee on the board (DeFond and Jiambalvo 1991), in firms with a large audit committee (Abbott et al. 2004), or a committee consisting of more independent members (Agrawal and Chadha 2005; Donohoe et al. 2007) as well as more financial experts (Abbott et al. 2004).

Recently, a smaller but growing stream of work has begun to consider how top management can influence behavior and decision of boards and other constituents, and subsequently impairs the efficacy of internal and external corporate governance mechanisms (Westphal and Zajac 2013). For example, Westphal (1998) finds that executives often use ingratiation and persuasion to influence board members so as to offset the effect of increased structural board independence on corporate strategy and CEO compensation. Similarly, Westphal and Bednar (2008) document that top executives use their interpersonal influence to prevent powerful institutional investors from forcing changes in board structure, CEO compensation, and corporate strategy that would have benefited shareholders while compromising managerial interests. Westphal and Deephouse (2011) apply the same logic to examine how CEOs use social influence and impression management techniques to affect journalists' reports about their firms and their leadership. A recent study by Bruynseels and Cardinaels (2014) shows that firms whose audit committee members have friendship ties with CEOs spend less in external audit services and are more likely to engage in earnings management. Following this trend in the literature, our paper explicitly incorporates the behavioral theory of corporate governance to examine the relationship between top management, audit committees, and shareholders in a broad social exchange context that highlights the shaping of individual behaviour in the midst of social relationships, networks, and institutions (Westphal and Zajac 2013).

Specifically, we view the relationship between shareholders, audit committee members, and management as a three-tier principal-supervisor-agency hierarchy, in which the principal (shareholders) delegates monitoring authority to a supervisor (the audit committee in our case) who evaluates and monitors the agent

(management) on behalf of the principal (Laffont and Tirole 1991; Tirole 1986). Similar to the standard principal-agent framework, the three-tier agency model also recognizes that self-interested managers may act to gain private interests at the cost of shareholders. Importantly, this model explicitly considers the motivation of the supervisor in exercising supervisory duties, since interests of the supervisor may also differ from those of shareholders. In particular, whether the supervisor will engage in active monitoring on behalf of the principal or line up with the agent is dependent on whether interests of the supervisor (audit committees) are more closely aligned with those of the principal (shareholders) or the agent (management). By explicitly taking into account the supervisor's motivation to conduct vigilant monitoring, the three-tier agency model thus enables us to examine how mutually contingent and mutually rewarding social exchange relationships between management and audit committee members and between shareholders and audit committee members may influence the efficacy of audit committees in exercising their monitoring function and improving financial reporting quality. From this aspect, our paper also supplements prior studies that have utilized this three-tier model to examine the effectiveness of external auditors (Antle 1982; Baiman et al 1987, 1991) and compensation committees (Conyon and He 2004) in safeguarding shareholder value. We also expand previous empirical work on social influence processes by developing and testing new hypotheses related to the role of social exchange on affecting audit committees' decision making.

The remainder of this paper is organized as follows. We first discuss the theoretical framework, namely the social exchange theory, employed in the paper. We then develop our hypotheses in Sect. 3. Section 4 describes data and empirical methods and Sect. 5 presents results of our main tests as well as additional analysis. We end the paper with a discussion and conclusion in Sect. 6.

2 Theoretical background

Social exchange is a series of repeated interactions that generate obligations between two parties, in which one party's action provides rewards and incentives for the actions of another party (Blau 1964; Emerson 1976; Homans 1961). It is a voluntary exchange action motivated by returns expected from the other party and is a mutually contingent and rewarding process (Blau 1964; Emerson 1976). The benefits derived from a social exchange relationship could be tangible with economic value or intangible without direct economic value. In particular, unlike in economic exchange where benefits are formal and contractual, benefits in social exchange are rarely specified or negotiated *ex ante*, but are voluntary in nature (Blau 1964).

Social exchange relationships are built upon the social influence top management could impose on board members and other constituents. The social-psychological literature suggests that management is able to influence board members through a variety of interpersonal mechanisms ranging from anchoring and persuasion to ingratiation and intimidation (Belliveau et al. 1996; Westphal 1998; Westphal and Zajac 2013). For example, management can apply ingratiation, an assertive social

influence tactic that enables individuals to gain favor with another person (Jones 1964; Kacmar et al. 2004). Because rendering personal favors for another person tends to generate positive affect for the ingratiator, this kind of positive affect from ingratiation often causes attribution biases in decisions and leads to favoritism toward the ingratiator in organizational decision making (Westphal 1998). Ingratiation behavior can also exert social influences by invoking the norm of reciprocity. Because individuals receive a personal favor often feel socially obligated to return it, norms of reciprocity can be manipulated and used as a weapon of influence toward those who have the capability to benefit or harm individuals engaging in ingratiation activities (Cialdini and Goldstein 2004).

We next apply this new theoretical angle to address how social influence and exchange relationships between audit committee members, top management, and shareholders may affect audit committees' effectiveness in supervising the financial reporting process, and consequently impact the incidence of financial restatements.

3 Hypotheses development

One crucial indicator of financial reporting quality is the incidence of financial restatements. A financial restatement represents a direct admission that financial information previously issued by the firm is incorrect and unreliable, thus weakens the validity and effectiveness of the underlying financial reporting process (Almer et al. 2008). A financial restatement also suggests that material misstatements have been undetected by the restating firm's internal control system as well as its external auditor certifying the issuance of the original statements, thus indicating severe shortcomings in both internal and external monitoring functions (Arthaud-Day et al. 2006). As a result, financial restatements often elicit strong negative market reactions and represent a costly problem in the capital market (Dechow et al. 1996; Palmrose et al. 2004; Wilson 2008).

Audit committee independence is widely believed to be a remedy for managerial malfeasance in financial reporting. Such a doctrine is reflected in security regulations around the world. In the U.S., Section 301 of the SOX requires that all audit committees shall be independent directors who are not affiliated with either the company or its subsidiary. Provision C. 3.1 of the U.K. corporate governance codes imposes a similar requirement on audit committee independence. In France, at least two-thirds of audit committee members in listed firms need to be independent non-executive directors, and the German corporate governance codes require the chairman of the audit committee to be independent. However, the empirical evidence is mixed. Although Abbott et al. (2004), Dechow et al. (1996), and Klein (2002) have found evidence that audit committee independence improves financial reporting quality measured by a smaller degree of earnings management and a reduced likelihood of restatements, neither Agrawal and Chadha (2005) nor Larcker et al. (2007) is able to document such a relationship. This inconsistency in empirical results leads to a natural question: are these committee members really independent from managerial influences?

Audit committee independence is typically measured using the proportion of outside directors on the committee. However, being an outside director, defined as a member who is neither currently employed by the firm nor has any contractual relationship with the firm, is insufficient for the director to make independent decisions and actively exercise his/her monitoring role free of managerial influence (Hermalin and Weisbach 1997; Hambrick et al. 2015; Morck 2009). Shivdasani and Yermack (1999) for example document that when the CEO is involved in the selection of board members, the firm tends to appoint fewer independent directors and more grey outsiders with conflicts of interests. A recent study by Carcello et al (2011) shows that CEO involvement in selecting board members impairs audit committee effectiveness by reducing the impact of audit committee independence and financial expertise on the likelihood of restatement.

The CEO's influence could be well explained by social exchange theory. According to this theory, if committee members are appointed after the CEO, they are more likely to feel a strong social obligation toward the incumbent CEO because challenging the CEO may put these directors' board seats as well as valuable personal and professional relationships with top management at risk (Lambert et al. 1993). Norms of reciprocity will thus prompt these committee members to make decisions in favor of the CEO's preference. As a result, they are less likely to engage in vigilant monitoring. For example, both Main et al. (1995) and Fiss (2006) find that CEO compensation is higher when the chair of the compensation committee is appointed after the CEO. Wade et al. (1990) document that the proportion of the board appointed under the current CEO is positively related to the adoption of golden parachutes for the CEO. In addition, Coles et al. (2014) show that firms with more directors appointed after the CEO (so called co-opted board members) have inferior monitoring quality demonstrated by diminished CEO turnover-performance sensitivity, increased CEO pay level, and decreased pay-performance sensitivity. By the same token, we expect that audit committees are less likely to engage in vigilant monitoring of the financial reporting process if a larger proportion of audit committee members are appointed after the CEO, which leads to the following hypothesis:

H1 Firms having a larger proportion of audit committee members appointed after the CEO are associated with higher incidences of restatements.

An independent nomination committee is often argued to be a valid control mechanism to curtail the influence of the CEO and other top executives on the appointment of board and committee members, (Shivdassani and Yermack 1999). Consequently all major stock exchanges in the U.S. have changed their listing requirements in late 2003 to reduce the formal involvement of CEOs in the selection process of board members. For example, NYSE listed firms are now required to have a nominating committee comprising only independent directors. NASDAQ listed firms demand director nominees to be recommended or selected by either an all-independent nominating committee or by the independent members of the full board of directors (Bebchuk and Fried 2004). The U.K. rule similarly requires that a majority of nomination committee members should be independent non-executive directors.

Based on social exchange theory, the reciprocal commitment in an exchange relationship is a principled obligation toward the other party from whom they receive benefits (Blau 1964; Homans 1961). With the existence of an independent nomination committee, audit committee members are less likely to attribute their board membership to the favor of the CEO, and more likely to view it as an endorsement by the nomination committee and shareholders. Consequently, audit committee members are less likely to feel a strong social obligation toward the incumbent CEO, which may improve their monitoring quality and consequently reduce the odds of restatements. Taken together, we make the following prediction:

H2 Firms with an independent nomination committee are associated with lower incidences of restatements.

The social-psychological literature suggests that management is able to influence board members through a variety of interpersonal mechanisms ranging from anchoring and persuasion to ingratiation and intimidation (Belliveau et al. 1996; Westphal and Stern 2007). Specifically, top management's capability to impose social influence and a board's vulnerability to receive social influence are affected by their relative status and prestige. Other things being equal, ingratiation coming from a high-status actor is especially powerful in creating positive affect and a feeling of indebtedness toward the ingratiator (Jones 1964). In addition, inferiority in status and prestige is likely to lead to opinion conformity, where inferior actors feel less powerful to challenge opinions of superior actors. Singh and Harianto (1989) for example find that a CEO with higher status than the board chair is more likely to receive a golden parachute package. In the case of audit committees, Badolato et al. (2014) show that the relative status between managers and audit committee members affects top management's perception on the audit committee's competence and willingness to confront managers in case of financial fraud. They subsequently document that audit committees are more effective in constraining earnings management when members have high relative status than CEOs.

One proxy of audit committee status is committee members' tenure. Long tenured board members are less likely to feel obligation toward the CEO (Wade et al. 1990). They are also more likely to reach their own conclusions in interpreting organizational events rather than relying on management for explanation (Donoher et al. 2007). A longer firm tenure also enables audit committee members to gradually accumulate knowledge of the firm and better understand the firm's operations, internal process, and financial situations (Golden and Zajac 2001). As their experience increases, audit committee members may become more effective at overseeing a firm's financial reporting process. As a result, these firms are less likely to make mistakes in financial statements and have fewer needs to correct financial reporting failures subsequently. Finally, members with longer board tenure may be less likely to engage in unethical or fraudulent behaviours in an attempt to protect their established reputation (Donoher et al. 2007). By the same token, we predict that audit committee members with longer tenure are more likely to engage in vigilant monitoring to prevent irregularities in the financial statements.

However, board members may entrench themselves and become more aligned with managers instead of shareholders as their tenure increases. The social exchange

theory suggests that social relationship grows and develops from repeated interactions between the exchange parties. Repeated interactions over time could enhance relational ties and strengthen the reciprocal commitment between the exchange parties (Blau 1964). A long interaction history will thus reinforce the norm of reciprocity between exchange parties. As a result, they are more likely to provide a favor for each other. O'Reilly et al. (1988) and Belliveau et al. (1996) both find that the longer the overlapping tenure between the compensation committee chair and the CEO, the higher the CEO compensation is. They attribute these findings to increased social obligations of compensation committee chairs to CEOs as a result of increased director tenure. A recent paper by Huang (2013) suggests that board tenure has an inverted U-shaped relation with firm value. He attributes this result to the fact that negative entrenchment effect may dominate the positive on-the-job learning effect after a threshold point. In our case, we expect that increasing board tenure may diminish an audit committee's effectiveness in supervising financial reporting quality. It should be noted that listed firms in the U.S. typically do not set specific term limits on director service. There are neither federal regulations nor laws to limit director tenure in the U.S., while the other nations are generally more restrictive on maximum director tenure.² Because social exchange theory and extant literature are ambiguous in predicting the impact of audit committee tenure on monitoring quality, we make the following competing hypotheses:

H3a Firms whose audit committee members possess longer tenure are associated with lower incidences of restatements.

H3b Firms whose audit committee members possess longer tenure are associated with higher incidences of restatements.

The above hypotheses focus on the social exchange relation between audit committee members and top management. In addition to the obligation toward top management, the social exchange relationship may also affect audit committee members' commitment toward shareholders. Homans (1958) suggests that "Persons that give much to others try to get much from them, and persons that get much from others are under pressure to give much to them". That is, amounts of exchanged benefits between two exchanged parties are dependent on the amount they receive from each other. Board members typically receive an annual cash retainer for their board seats and sometimes additional fees for attending board and committee meetings. Social exchange theory suggests that a person in a social exchange relation expects the other to fulfill a fairness norm, to be reciprocal in kind, or simply to be grateful. This norm of reciprocity will subsequently affect an individual's behavior and decision (Westphal and Zajac 2013). For example, the efficiency wage argument suggests that paying employees more than the market-clearing wage helps increase their productivity and efficiency (Shapiro and Stiglitz

² For example, the U.K. Corporate Governance Code requires a board to explain in its annual disclosures whether a director who has served more than 9 years qualifies as independent. In Hong Kong, an independent director's tenure is limited to 9 years at a maximum. In France, a director will not be classified as independent if they have served more than 12 years (Katz and McIntosh 2014).

1984; Stiglitz 1987). In their study of corporate boards, Adams and Ferreira (2008) find that directors are less likely to have attendance problems at board meetings when they receive higher board meeting fees. That is, corporate directors indeed perform better in case of higher financial rewards even if the amount is rather small. By the same token, we expect that directors and committee members who receive higher payments for their board positions tend to work more vigilantly to monitor the financial reporting process as a reciprocal return to shareholders, which gives rise to the following prediction:

Hypothesis 4 Firms whose audit committee members receiving higher compensation for their board positions are associated with lower incidences of restatements.

4 Data and methodology

4.1 Sample selection and matching process

Data on audit committees and boards are collected from the Investor Responsibility Research Center (IRRC). The IRRC data provide detailed demographic and positional information for directors in the U.S. S&P1500 firms. Restatement data are obtained from General Accounting Office (GAO)'s 2002 and 2006 reports, which include earnings restatements announced between January 1998 and December 2005. We use the 4-year panel data of 2002–2005 in our main analysis. We also contrast the 2002–2005 data with the 1998–2001 data in our additional analysis. According to GAO, a restatement is defined as “an instance in which a company restates its financial statements because they were not fairly presented in accordance with generally accepted accounting principles (GAAP). This would include material errors and fraud...”. Restatements resulting from normal business activity such as accounting policy changes or for presentation purposes were excluded from the GAO sample. To further classify these restatement events, we supplement GAO data with company reports by searching LexisNexis to gather information on reasons of restatements and initiators of restatements. We also supplement GAO data with irregularity classifications provided by Hennes et al. (2008). We obtain accounting and financial information from COMPUSTAT. The pre-matching S&P1500 sample includes 4140 firm years without restatement and 299 firm years with financial restatements. After excluding firm years without complete information on audit committees, board characteristics, and financial data, the pre-matching sample consists of 278 observations with restatements and 3743 observations without restatements.

Because restatements occur relatively infrequently, making random sampling infeasible, we apply a match-sample design following previous literature (e.g., Arthaud-Day et al. 2006; Harris and Bromiley 2007). We match each restated firm with a non-restated firm that is in the same year, is nearest in size (measured by total assets), and is in the same industry represented by the four-digit SIC code. We are able to find appropriate matches for 191 restated firms, giving a total sample size of

382 firms.³ The sample selection and matching process is summarized in Table 1. In our additional analysis, we utilize the same matching method for our 1998 to 2001 sample. We find matches for 54 restated firms, and obtain a total of 108 firms in our pre-SOX sample.

4.2 Test variables

We use a dummy variable (RESTATE) to capture a restatement, with one representing the occurrence of a restatement event (half of the total sample) in the given firm year and zero representing the matched counterpart of non-restated firms. To illustrate more details about our restatement sample, we further partition restatements in two ways. First, we classify a restatement as either fraud-related or error-related based on criteria applied by Hennes et al. (2008)'s study. In brief, a restatement is classified as fraud-related if the restatement is caused by an international misreporting of financial statements, or related to SEC, Department of Justice or independent investigations, while is classified as error-related if it is related to a basic accounting mistake or a data error. Second, we group restatements by its initiators. A restatement is classified as internally initiated if it is prompted or jointly prompted by the company, its board of directors, or its audit committee, and is classified as externally initiated if it is prompted by the external auditor, SEC, IRS (Internal Revenue Service), FASB (Financial Accounting Standards Board), or any combination of these agencies.

To illustrate distribution of various restatement types and to test the representativeness of our matching sample as well as changes in restatement events before and after the SOX, we contrast types of restated firms in the whole S&P1500 sample with our pre-SOX and post-SOX matching samples respectively. Results are reported in Table 2. Table 2 suggests that incidences of restatements increase significantly in the post-SOX period of 2002 and onward. A total of 299 restatement events are identified in the S&P 1500 samples during this period, while only 97 events are identified in the pre-SOX period between 1998 and 2001. This result is consistent with a GAO report which reveals that financial restatements have drastically increased in the post-SOX period from the pre-SOX level (GAO 2006). Table 2 also shows that about 63.55% of restatements in the post SOX period is prompted internally, representing a 10% increase from the pre-SOX level. We also find that about 20% of restatements in the post-SOX period are fraud-related and the rest 80% are error-related. There is no significant change in the irregularity type from the pre- to post-SOX period. Furthermore, Table 2 suggests that the

³ O'Connor et al. (2006) point out that industry and firm size are two most important factors that could affect the likelihood of financial restatements. On one hand, industry structure, regulation, industry environment could all be antecedents of financial misconducts. We control these variations through matching by four-digit SIC codes. That is, restated firms and non-restated firms are required to belong to the same industry sector. On the other hand, firm size could also significantly affect the likelihood of financial restatements. We use the nearest neighbor method to perform matching, i.e., choose a non-restated firm closest to the size of a restated firm in a given industry at a given year. The descriptive analysis reported in Table 2b suggests that the average size of our restatement sample is not significantly different from that of the non-restated sample. This result demonstrates that our matching is effective with minimal sample selection bias.

Table 1 Sample selection and matching process

	Firm-year obs. with restatement	Firm-year obs. without restatement
Initial restating firms in S&P 1500 over year 2002–2005	299	4140
Less: firms without complete Compustat data	(3)	(66)
firms without complete audit committee and board information	(18)	(331)
Pre-matching sample size	278	3743
Matched Sample using industry, year and firm size	191	191

Table 2 The representativeness of matching sample

Variables	Full S&P1500 sample		Matching sample	
	Pre SOX (1998–2001)	Post SOX (2002–2005)	Pre SOX (1998–2001)	Post SOX (2002–2005)
<i>Restatement firms</i>	97	299	54	191
<i>By initiators</i>				
Internal (%)	51 (52.57%)	190 (63.55%)	30 (55.56%)	120 (62.83%)
External (%)	46 (47.43%)	109 (36.45%)	24 (44.44%)	71 (37.17%)
<i>By irregularity</i>				
Fraud (%)	19 (19.59%)	60 (20.07%)	8 (14.82%)	41 (21.47)
Error (%)	78 (80.41%)	239 (79.93%)	46 (85.12%)	150 (78.53%)

distribution of restatement types in our matching samples closely resemble the original S&P1500 sample. As a result, generalizability is well maintained in our matching process.

Audit committee characteristics are measured as follows. First, APPOINT_AFTER captures the percentage of audit committee members appointed after the CEO. NORMINATION is a dummy variable with one indicating the existence of an all-independent nomination committee and zero otherwise. Nomination committee independence is defined as having none of members being former or current employees, nor holding any contractual relationship with the firm. The average committee tenure, AVE_TENURE, is calculated as the sum of all audit committee members' tenures divided by the committee size, where director tenure is measured as the number of years a director has served on the board. We measure ANNUAL_FEE as the annual cash compensation that a director receives from the company by serving on the board and the audit committee.

We also include additional audit committee variables that may affect the likelihood of financial restatements. First of all, audit committee size may affect its effectiveness (Beasley 1996). We measure audit committee size (AUDIT_SIZE) as

the total number of directors sitting on the audit committee. The square of audit committee size, *SIZE_SQUARE*, is also included to capture nonlinearity in this relationship. Prior literature also suggests that financial expertise of audit committee members affects monitoring effectiveness (DeFond et al. 2005; Krishnan and Lee 2009). We use *EXPERT_RATIO* to measure the proportion of financial experts on the audit committee (Cohen et al. 2014; DeFond et al. 2005). Our classification of a financial expert embraces Agrawal and Chadha's (2005) definition of both accounting and non-accounting financial experts. Specifically, a director is classified as a financial expert when he/she is a CPA, an accountant, an auditor, a controller, managing partners of a financial institution, CFO, CAO, CEO, or president of a company. Prior literature also suggests that the effectiveness of audit committees is affected by whether these members are over-committed or not (Faleye et al. 2011; Ferris et al. 2003; Pritchard et al. 2003). We consequently measure average external board seats and internal committee seats of audit committee members. The average directorship, *AVE_BOARDSEAT*, is calculated as the sum of each committee member's outside directorships divided by the committee size, where directorship is measured as the total number of external boards a director is sitting on (Ferris et al. 2003; Fich and Shivdasani 2006). *AVE_COMMSEAT*, is calculated as the sum of each committee member's internal committee seats divided by the audit committee size (Faleye et al. 2011). The extant literature also suggests that more active committee members who meet more frequently are associated with higher monitoring quality (Ghosh et al. 2010; Larcker et al. 2007). We thereby capture the activeness of an audit committee using the total number of committee meetings, denoted as *MEET_NUM*.

In addition, we control for characteristics of board of directors. As explained by Cohen et al. (2004), since a board empowers and selects members of an audit committee, the audit committee cannot be effective in fulfilling its oversight functions without strong board support. We include two measures of board characteristics based on previous literature (Klein 2002). *IND_RATIO* is calculated as the proportion of independent directors serving on the board. Here a director is classified as independent if he/she is neither a current or former employee of the company nor has any contractual relationship with the company. We also measure leadership duality, *DUAL*, with one indicating a combined CEO and chairperson position and zero otherwise. In general, we expect that a higher quality board, characterized as a higher proportion of independent directors, and a separate CEO and chairperson post, is associated with a lower incidence of financial restatements. We exclude the measure of board size due to high correlation between audit committee size and board size.

Finally, we control for firm characteristics that may influence the likelihood of restatement. Firm size (denoted as *LOG_ASSETS*) is measured as the natural log of total assets at the beginning of the restatement year. We expect a positive relationship between firm size and the incidence of restatements. Market to book ratio (*MB_RATIO*) is calculated as total market value of equity divided by book value of equity, which indicates a firm's performance potential. We expect a negative association between market to book ratio and the likelihood of restatements. A firm's growth rate (*GROWTH*) is calculated as the average growth

rate of net sales in the 3 years preceding a restatement. We predict a positive sign between a firm's growth potential and the occurrence of restatements because a rapidly growing firm is more likely to experience internal control problems such as failing to meet an increase in customer demand or record an entry in a new market, which may result in subsequent restatements (Beasley 1996; Doyle et al. 2007). A dummy variable LOSS is used to indicate whether a firm is experiencing losses in the year prior to a restatement. We predict a positive association between the LOSS dummy and the probability of restatements, because troubled firms with poor financial performance are more likely to engage in earnings management which may cause subsequent financial restatements (Loebbecke et al. 1989). Importantly, we also control for the influence of previous restatement events on the likelihood of following restatements as well as on board and committee structures. HISTORY carries the value one if the firm has experienced a restatement at any time in the previous 3 years and zero otherwise. The definitions of variables are summarized in "Appendix". We lag all independent and control variables by 1 year following prior literature (e.g., Abbott et al. 2004; Agrawal and Chadha 2005; Beasley 1996). That is, we examine audit committee characteristics in the year before the restating year.

4.3 Analytical methods

Consistent with prior literature (e.g., Harris and Bromiley 2007; O'Connor et al. 2006), we apply a conditional logit model in our main test, which is a standard procedure for estimating models with matched case-control samples with zero/one dependent variables. The conditional logit model estimates a logit model with a fixed effect for each match (Agresti 2002; Hosmer and Lemeshow 2000). An important feature of this fixed-effect model is to control for the endogeneity problems created by unobserved firm-specific effects that are correlated with both dependent and independent variables (Hsiao 2003).

5 Empirical results

5.1 Univariate analysis

Tables 3 and 4 presents descriptive statistics of key variables. Table 3 shows mean, median, minimum and maximum values of the combined sample. Table 4 splits the total sample into two sub-samples representing the experience group of restated firms and the control group of non-restated firms and contrasts mean values of key variables. Tables 3 and 4 indicate that about 52% of audit committee members are appointed after the CEO. In particular, the restated subsample has a significantly higher percentage of independent audit committee members being appointed after the CEO than the control group (55 versus 49%). Eighty-four percent of our sample firms have an independent nominating committee, while restated firms are less likely to possess a nominating committee compared to the matching counterpart (86 versus 90%). The average tenure of an audit committee member is 8.65 years for the whole sample and 7.95 years for the restated subsample, which is significantly less

Table 3 Pooled sample statistics

Variables (n = 382)	Mean	Median	Min.	Max.	SD
APPOINT_AFTER	0.52	0.50	0.00	1.00	0.37
NORMINATION	0.84	1.00	0.00	1.00	0.37
AVE_TENURE	8.65	8.00	2.00	24.34	3.89
ANNUAL_FEE (1,000\$)	30.52	30.00	0.00	100.00	19.11
AUDIT_SIZE	3.83	4.00	1.00	9.00	1.03
EXPERT_RATIO	0.52	0.50	0.00	1.00	0.27
AVE_AUDITSEAT	1.14	1.00	0.00	3.00	0.75
AVE_BOARDSEAT	1.85	1.75	1.00	5.70	0.72
MEET_NUM	8.54	8.00	4.00	29.00	4.32
IND_RATIO	0.71	0.73	0.00	0.93	0.13
DUAL	0.61	1.00	0.00	1.00	0.48
HISTORY	0.06	0.00	0.00	1.00	0.24
LOG_ASSETS	4.14	3.44	1.77	5.47	4.58
LOSS	0.17	0.00	0.00	1.00	0.36
MB_RATIO	1.23	0.79	0.05	9.66	1.33
GROWTH	9.76	6.68	-31.13	124.30	19.71

Table 4 Mean value for sample firms with versus without restatements

Variables	With restatement	Without restatement	Difference	<i>p</i> value (one tail)
APPOINT_AFTER	0.55	0.49	0.06	0.05**
NORMINATION	0.86	0.90	-0.04	0.03**
AVE_TENURE	7.95	9.35	-1.40	0.00***
ANNUAL_FEE	30.30	30.72	-0.42	0.41
AUDIT_SIZE	3.80	3.86	-0.06	0.28
EXPERT_RATIO	0.52	0.51	0.01	0.39
AVE_AUDITSEAT	1.06	1.21	-0.15	0.02**
AVE_BOARDSEAT	1.81	1.89	-0.08	0.12
MEET_NUM	9.23	7.88	1.35	0.00***
IND_RATIO	0.72	0.71	0.01	0.37
DUAL	0.62	0.60	0.02	0.34
HISTORY	0.08	0.04	0.04	0.03**
LOG_ASSETS	4.18	4.09	0.09	0.25
LOSS	0.19	0.11	0.08	0.01***
MB_RATIO	1.10	1.35	-0.24	0.03**
GROWTH	8.92	10.60	-1.68	0.19
OBSERVATIONS	191	191		

p value of one tailed *t* test is reported

** Significant at 0.05 level; *** Significant at 0.01 level

than the average number in the non-restated subsample (9.35). In addition, we find that audit committee members on a restated firm have significantly fewer external audit committee seats (2.07) than those sitting on the control group (2.21). No statistically significant differences in average external board seats, proportion of financial expertise, director compensation, audit committee size, proportion of independent directors on the board, and leadership duality are observed. We also find that a restated firm is more likely to have a previous restatement event, experience a loss, have smaller market to book ratio, and possess smaller growth opportunities than a non-restated firm.

Table 5 reports Pearson correlation coefficients of key variables. Consistent with our expectation, the proportion of committee members appointed after the CEO is positively related to restatements, whereas the existence of an independent nomination committee and average committee tenure are negatively related to the likelihood of restatements. We also find that annual director compensation is negatively related to the incidence of restatements. These results provide preliminary support for our main hypotheses.

5.2 Conditional logit model analysis

Our main results obtained from the conditional logit model are reported in Table 6.⁴ Column 1 of Table 6 reports results based on the full matched sample of 382 observations (191 restated and 191 non-restated firms). To prevent the impact of previous restatement events on the likelihood of the following restatements or on the structures of audit committees, we also exclude all firms that have restated their earnings in the previous 3 years from the sample. The remaining sample has 166 restated firms, 166 matching firms, and an overall sample size of 332. We report results from this trimmed sample in Column 2 of Table 6.

As observed in Table 6, a positive and significant relationship exists between the proportion of audit committee members appointed after the CEO and the likelihood of restatements, which supports H1. This result is qualitatively consistent with Coles et al. (2014) who find that firms with more co-opted board members are associated with inferior board monitoring quality. Table 6 also indicates a negative and significant relationship between the existence of an independent nomination committee and the likelihood of restatements as H2 predicts. This result echoes findings of Shivdassani and Yermack (1999) and Carcello et al. (2011). Both studies confirm that the existence of an all-independent nomination committee helps curtail a CEO's influence in board selection, thus improving board monitoring quality and audit committee effectiveness. Further, committee members' average tenure is found to have a significantly negative relation with the likelihood of restatements. This result supports H3a which predicts that audit committee members with longer tenure are more effective in reducing financial restatements, while contradicts with the counter-hypothesis of H3b. As a result, the expert effect of committee members seems to dominate their entrenchment effect in our

⁴ We tested for multicollinearity and in general there were no problems. The variance inflation factor (VIF) for the independent variables were all below 2.0 with the only exception being audit committee size and audit committee size square. Therefore, multicollinearity is not a concern.

Table 5 Correlation matrix for key variables

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
RESTATE [1]	1.00							
APPOINT_AFTER [2]	0.09*	1.00						
NORMINATION [3]	-0.11*	-0.15*	1.00					
AVE_TENURE [4]	-0.18*	-0.14*	-0.04	1.00				
EXPERT_RATIO [5]	-0.01	-0.03	0.06	-0.16*	1.00			
AVE_AUDITSEAT [6]	-0.09*	-0.06	0.21*	0.08	0.00	1.00		
AVE_BOARDSEAT [7]	0.00	-0.05	0.12*	-0.12*	0.09	0.09	1.00	
ANNUAL_FEE [8]	-0.10*	-0.08	0.16*	-0.07	-0.01	0.05	0.22*	1.00
AUDIT_SIZE [9]	-0.03	-0.05	0.16*	-0.02	-0.00	-0.04	0.21*	0.23
MEET_NUM [10]	0.14*	-0.22*	0.16*	-0.09	0.04	0.03	0.03	0.07
DUAL [11]	0.01	0.10*	0.13*	0.02	0.00	-0.04	0.12*	0.09
IND_RATIO [12]	0.02	-0.14*	0.21*	-0.25	0.09	-0.14*	0.17*	0.16*
HISTORY [13]	0.09	-0.13*	-0.02	-0.07	-0.00	-0.02	0.02	0.01
LOG_ASSETS [14]	0.03	-0.01	0.05	-0.07	0.02	-0.10	0.22*	0.24
LOSS [15]	0.11*	-0.08	-0.06	-0.11*	0.01	-0.00	0.05	-0.03
MB_RATIO [16]	-0.09	-0.03	0.03	0.09	-0.02	-0.22*	-0.10*	-0.03
GROWTH [17]	-0.02	0.11	-0.04	-0.00	-0.08	0.02	0.07	-0.05

Variables	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]
RESTATE [1]									
APPOINT_AFTER [2]									
NORMINATION [3]									
AVE_TENURE [4]									
EXPERT_RATIO [5]									

Table 5 continued

Variables	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]
AVE_AUDITSEAT [6]									
AVE_BOARDSEAT [7]									
ANNUAL_FEE [8]									
AUDIT_SIZE [9]	1.00								
MEET_NUM [10]	0.12*	1.00							
DUAL [11]	0.19*	0.06	1.00						
IND_RATIO [12]	0.32*	0.13*	0.14*	1.00					
HISTORY [13]	0.00	0.18*	0.01	0.08	1.00				
LOG_ASSETS [14]	0.27*	0.07	0.13*	0.09	-0.01	1.00			
LOSS [15]	-0.05	0.26*	-0.05	-0.06	0.20*	-0.06	1.00		
MB_RATIO [16]	-0.24*	-0.19*	-0.15*	-0.26*	-0.09	-0.19*	-0.11*	1.00	
GROWTH [17]	-0.07	-0.14*	-0.02	-0.15*	-0.14*	0.01	-0.15*	0.36*	1.00

* Significant at 0.05 level or above

Table 6 The influence of audit committee characteristics on restatements

Dependent variable: RESTATE	Expected sign	Conditional logit model (fixed-effects logistic)	
		Including firms with restatement history	Excluding firms with restatement history
APPOINT_AFTER [H1]	+	0.63* (0.34)	0.77** (0.37)
NORMINATION [H2]	-	-1.24** (0.59)	-1.17** (0.62)
AVE_TENURE [H3]	+/-	-0.09*** (0.03)	-0.10*** (0.04)
ANNUAL_FEE [H4]	-	-0.02** (0.01)	-0.03*** (0.01)
AUDIT_SIZE	+	2.55*** (0.93)	2.49*** (0.97)
SIZE_SQUARE	-	-0.30*** (0.11)	-0.29*** (0.11)
EXPERT_RATIO	-	-0.05 (0.45)	-0.17 (0.51)
AVE_AUDITSEAT	-	-0.25 (0.19)	-0.34* (0.20)
AVE_BOARDSEAT	+	0.15 (0.19)	0.05 (0.20)
MEET_NUM	+	0.13*** (0.05)	0.13*** (0.05)
DUAL	+	0.06 (0.27)	0.09 (0.29)
IND_RATIO	-	-0.01 (0.01)	-0.01 (0.01)
HISTORY	+	0.39 (0.52)	/ /
LOG_ASSETS	+	0.00 (0.00)	0.00 (0.00)
LOSS	+	0.39 (0.36)	0.14 (0.39)
MB_RATIO	-	-0.04 (0.14)	-0.08 (0.15)
GROWTH	+	-0.00 (0.01)	-0.00 (0.01)
Observations		382	332
Pseudo R Square		0.2011***	0.2106***

Estimated coefficients, standard errors, and *p* values for two-tailed tests are reported

* Significant at 0.10; ** Significant at 0.05; *** Significant at 0.01

sample. Our result is qualitatively consistent with Ghosh et al. (2010) who find that the average tenure of audit committee members is negatively associated with earnings management in a sample of U.S. firms. It also coincides with Donoher et al. (2007)'s finding on the relationship between board member tenure and the likelihood of financial frauds in a U.S. sample. Finally, we find support of H4, which indicates that firms paying higher fees to committee members are associated with a smaller likelihood of restatement. These results are qualitatively consistent with Adams and Ferreira (2008) who find that higher payments to board members motivate them to work more vigilantly to protect shareholders' interests.

Several control variables are also worth mentioning. Table 6 suggests that audit committee size has a positive impact on the occurrence of restatement, but at a decreasing rate. In addition, firms whose audit committee members hold more internal committee seats are associated with a smaller likelihood of restatements. This result is qualitatively consistent with Faleye et al. (2011). Moreover, the number of committee meetings is positively associated with the incidence of restatement. This result is consistent with Larcker et al. (2007)'s observations that audit committees tend to meet more frequently for upcoming restatements.

5.3 Pre-SOX versus Post-SOX effect

Jensen (1993) argues that regulatory environment is an important force to promote effective corporate governance. Our main test is conducted using sample data from the post-SOX period of 2002 to 2005 when more stringent regulations and governance rules are imposed to constrain behaviors of management, board and audit committee members. However, the impact of audit committees on financial reporting quality may be affected by regulatory changes. For example, Collins et al. (2009) find that firms restating their earnings experience higher rates of involuntary CFO turnover in the post-SOX period compared to the pre-SOX period. In contrast, Ghosh et al. (2010) document that the association between board and audit committee characteristics and earnings management are actually weaker rather than stronger in the post-SOX period compared to the pre-SOX era. According to the behavioral theory of corporate governance, decisions of corporate constituents are shaped by the social context they are facing (Westphal and Zajac 2013). In order to examine the influence of regulatory environment on audit committee effectiveness and to better compare our study with extant literature using pre-SOX samples, we next extend our sample period from the post-SOX period applied in the main analysis to the pre-SOX period of 1998–2001. We use the same sample selection method and matching technique for this sample, and obtain 54 restating firms, 54 matching firms, and a total sample size of 108 observations.

Table 7 provides descriptive statistics of main independent and control variables by contrasting the pre-SOX (1998–2001) matching sample with the post-SOX (2002–2005) matching sample. We can tell that there is no significant change in the proportion of audit committee members appointed after CEOs in the post-SOX period. In addition, we find that only 74% of firms have an independent nomination committee in the pre-SOX period, while this number increases drastically to 84% in the post-SOX years due to regulatory reforms. We also find that the average tenure

Table 7 Audit committee and board characteristics: pre- versus post-sox samples

Variables	Pre-SOX 1998–2001	Post-SOX 2002–2005	Difference	<i>p</i> value (one tail)
APPOINT_AFTER	0.55	0.52	0.03	0.24
NORMINATION	0.74	0.84	−0.10	0.00***
AVE_TENURE	9.79	8.65	1.14	0.00***
ANNUAL_FEE	21.96	30.52	−8.56	0.00***
AUDIT_SIZE	3.78	3.83	−0.04	0.35
EXPERT_RATIO	0.53	0.52	0.01	0.26
AVE_AUDITSEAT	0.74	1.14	−0.40	0.00***
AVE_BOARDSEAT	2.00	1.85	0.15	0.02**
MEET_NUM	7.75	8.54	−0.79	0.04**
IND_RATIO	0.69	0.71	−0.02	0.05**
DUAL	0.63	0.61	0.02	0.38
HISTORY	0.06	0.06	0.00	0.44
LOG_ASSETS	3.82	4.14	−0.32	0.02**
LOSS	0.11	0.15	−0.04	0.10*
MB_RATIO	1.48	1.23	0.25	0.05**
GROWTH	13.63	9.76	3.87	0.03**
OBSERVATIONS	118	382		

* Significant at 0.10; ** Significant at 0.05; *** Significant at 0.01

of audit committees actually decreases in the post-SOX period. This result is consistent with findings of Badolato et al. (2014) who document that the SOX term on financial expertise results in more junior members being appointed to audit committees. In addition, an average audit committee member tends to have fewer external directorships but more external audit committee seats after 2002. There is also a significant increase in the number of board meetings and the proportion of independent directors on the board in the post-SOX period. Table 7 also suggests that firms in the post-SOX sample tend to be larger, are more likely to experience a financial loss, have smaller market to book ratio, and have smaller growth rates. In general, these results suggest that the SOX indeed brings changes to the composition of audit committees and boards.

We then examine whether the SOX actually strengthens the function of audit committees apart from bringing structural changes. Table 8 contrasts the impact of audit committee characteristics on restatements in the pre-SOX period with that in the post-SOX period by applying the conditional logit model. Table 8 suggests that the proportion of committee members appointed after the CEO, committee members' average tenure, and director fees have no significant impact on the likelihood of restatements in the pre-SOX period, while they are all statistically significant in the post-SOX period. We also notice that the impact of committee size on restatement is significantly different between the pre-SOX and the post-SOX periods. Although a larger audit committee reduces earnings restatements in the pre-SOX period, it actually increases earnings restatements in the post-SOX period. The later result is qualitatively consistent with Larcker et al. (2007)'s study using the

Table 8 The influence of audit committee characteristics on restatements: pre-SOX versus post-SOX period

Dependent variable: RESTATE	Conditional logit model		Difference
	Pre-SOX (1)	Post-SOX (2)	Chi-square (<i>p</i> value)
APPOINT_AFTER[H1]	1.34 (1.24)	0.63* (0.34)	3.15* (0.08)
NORMINATION[H2]	-2.47* (1.41)	-1.24** (0.59)	1.17 (0.28)
AVE_TENURE[H3]	-0.13 (0.09)	-0.09*** (0.03)	0.34 (0.56)
ANNUAL_FEE[H4]	-0.02 (0.03)	-0.02** (0.01)	2.34* (0.10)
AUDIT_SIZE	-3.87* (2.31)	2.55*** (0.93)	13.15** (0.00)
SIZE_SQUARE	0.46* (0.28)	-0.30*** (0.11)	12.94*** (0.00)
EXPERT_RATIO	-1.89* (1.07)	-0.05 (0.45)	2.75* (0.09)
AVE_AUDITSEAT	-1.83** (0.82)	-0.25 (0.19)	6.27*** (0.01)
AVE_BOARDSEAT	-0.95 (0.61)	0.15 (0.19)	4.49** (0.03)
MEET_NUM	0.47** (0.20)	0.13*** (0.05)	3.45* (0.06)
DUAL	1.36* (0.79)	0.06 (0.27)	2.74* (0.09)
IND_RATIO	0.06** (0.03)	-0.01 (0.01)	5.29** (0.02)
HISTORY	1.07 (1.90)	0.39 (0.52)	0.05 (0.81)
LOG_ASSETS	0.00 (0.00)	0.00 (0.00)	1.73 (0.18)
LOSS	3.51** (1.49)	0.39 (0.36)	5.34** (0.02)
MB_RATIO	0.11 (0.25)	-0.04 (0.14)	0.50 (0.47)
GROWTH	-0.00 (0.02)	-0.00 (0.01)	0.01 (0.91)
Observations	108	382	
Pseudo R Square	0.5165	0.2011	

Estimated coefficients, standard errors, and *p* values for two-tailed tests are reported

* Significant at 0.10; ** Significant at 0.05; *** Significant at 0.01

2002–2003 sample, which also identifies a positive while insignificant sign between board/committee size and the likelihood of restatements. Moreover, we find that the proportion of financial experts in the audit committee significantly reduces the chance of restatements in the pre-SOX period, while no significant effect is observed in the post-SOX period. This result echoes Badolato et al. (2014)'s claim that regulatory pressure in the post-SOX period to increase audit committees' financial expertise and independence may actually diminish the influence of committee members on financial reporting quality. In addition, we notice a significant negative relationship between the average external audit committee seat holding and the occurrence of earnings restatements in the pre-SOX period, while no significant effect is identified in the post-SOX sample. Moreover, we find that leadership duality and board independence are both associated with a larger likelihood of earnings restatement in the pre-SOX period, but such an association is not established in the post-SOX period.

Overall, these results suggest that the impact of audit committee characteristics on financial restatements is different before and after the SOX in many aspects. These results may be explained by several factors. First of all, Larcker et al. (2007) suggest that regulatory changes may prompt greater conformity in firm governance mechanisms, and consequently reduce the power of statistical tests in some variables. In addition, regulatory changes may affect the interplay and social exchange relationship between audit committee members, top management, and shareholders. On the one hand, more stringent regulations may substitute for the need of internal governance control. For instance, a financial expert on the audit committee may be especially important in detecting financial irregularities during the pre-SOX period when financial disclosure is more opaque and internal control is weaker, while the need to rely on committee members' financial expertise may be lessened in the post-SOX period with much better information disclosure and a more robust internal control system in place (Badolato et al. 2014). On the other hand, regulations may also complement internal corporate governance system. For example, audit committee members might feel more compelling to work for shareholders' interests due to new regulatory pressure, particularly when they are getting higher director compensation from the company, while such a pressure may be less salient in the pre-SOX period when they are more inclined to consider managerial preference.

5.4 Earnings management and financial restatement

In addition to financial restatements, earnings quality can be measured by other proxies such as discretionary accruals, earnings persistence, earnings smoothness, and internal control deficiencies. When contrasting strengths and weaknesses of earnings quality measures, Dechow et al. (2010) point out that "a significant benefit of using the restatement sample to identify firms with earnings quality problems is a lower Type I error rate in the identification of misstatements. In addition, the restatement sample has the added advantage of size." Similarly, Agrawal and Chadha (2005) suggest that a restatement is a direct admission by managers of false accounting and financial misrepresentation while other measures such as earnings

Table 9 Comparison in earnings management measures between restated and non-restated firms

Variables	With restatement	Without restatement	Difference	<i>p</i> value (two-tailed)
REDCA	0.003 (n = 180)	-0.008 (n = 147)	0.011	0.02**
DA_ROA	0.007 (n = 175)	-0.001 (n = 157)	0.008	0.05**

The number of observations used for comparison is listed in parentheses. *REDCA* represents performance adjusted discretionary current accruals

DA_ROA represents performance adjusted total discretionary accruals ** Significant at 5%

management may be more subtle. To validate the usage of restatement as a proxy for financial reporting quality, we then conduct an additional analysis to test the relationship between restatements and earnings management, another popular measure of earnings quality.

We apply two different measures of earnings management. First, we calculate performance adjusted discretionary current accruals (*REDCA*) as a proxy for earnings management for restated and non-restated firms respectively. We follow Ashbaugh et al. (2003) to calculate *REDCA* with higher number indicating higher earnings management.⁵ Our total sample is reduced to 180 restated firms and 147 non-restated firms due to missing data. Table 9 indicates that the mean of adjusted discretionary current accruals is 0.003 for restated firms and -0.008 for non-restated firms. The two-tailed *t*-test is significant at the 0.05 level, indicating restated firms are more likely to manipulate their earnings compared to non-restated counterparts. Second, we estimate performance adjusted total discretionary accruals (*DA_ROA*) following Kothari et al. (2005). The description of the method is omitted here. The *t*-test on the means of *DA_ROA* is also significant at the 0.05 level, which is again consistent with the notion that earnings quality is lower for restated firms than non-restated firms. Overall, these results suggest that the incidence of financial restatements could serve as a valid proxy for earnings quality.

⁵ To calculate *REDCA*, we first partition the entire population of Compustat firms by two-digit SIC codes, we exclude financial sector firms and industries with fewer than 15 firms. We then estimate parameters for normal accruals for each two-digit SIC industry by year using the following equation: $CA_t = \beta_0 + \beta_1(I/A_{t-1}) + \beta_2(\Delta Rev_t) + \beta_3(ROA_{t-1}) + \varepsilon_t$ where: CA_t = current accruals, reflected by net income before extraordinary items (Compustat data item # 123) plus depreciation and amortization (Compustat data item # 125) minus operating cash flows (Compustat data item # 308) scaled by total assets at the beginning of year. TA_{t-1} represents total assets at the beginning of the fiscal year *t*. ΔRev_t captures revenue changes, which is calculated as net sales (Compustat data item #12) in year *t* minus net sales in year *t* - 1 then scaled by the beginning of the year total assets. ROA_{t-1} is the return on asset ratio calculated as income before extraordinary items (Compustat item #18) scaled by total assets in year *t* - 1. All variables are winsorized at the 1st and 99th percentiles. The parameters estimated from this equation are used to calculate expected current accruals (*ECA*): $ECA_t = b_0 + b_1(I/A_{t-1}) + b_2(\Delta Rev_t - \Delta AR_t) + b_3(ROA_{t-1})$, where ΔAR_t indicates changes in accounts receivable, which is calculated as accounts receivable (Compustat item #2) in year *t* minus accounts receivable in year *t* - 1, scaled by the beginning of year total assets. The discretionary current accruals (*REDCA*) are calculated as follows: $REDCA_t = CA_t - ECA_t$.

6 Discussions and conclusion

This study advances corporate governance literature by applying the three-tier agency model and social exchange theory to study the effectiveness of audit committees in reducing financial restatements and improving financial reporting quality. We argue that social exchange relationships in the three-tier hierarchy between audit committee members (the supervisor), top management (the agent), and shareholders (the principal) affect motivations and decisions of committee members, and in turn influence the effectiveness of audit committees in supervising a firm's financial reporting process. Using financial restatement data for a sample of U.S. listed firms during the post-SOX period of 2002–2005, we find that firms with a greater proportion of audit committee members appointed after the CEO are associated with a larger likelihood of restatements, while the presence of an all-independent nominating committee helps reduce the incidence of restatements. In addition, firms whose audit committee members have longer tenure and receive higher fees are less likely to engage in restatements. Our paper thus extends extant empirical studies on financial reporting quality to explicitly investigate how audit committees' monitoring effectiveness may be affected by interpersonal influence and social exchange processes in a three tier principal-supervisor-agent hierarchy.

From a theoretical standpoint, our paper explicitly utilizes behavioral theory of corporate governance to investigate effectiveness of audit committees in improving financial reporting quality and protecting shareholder interests. A common critique of the agency theory is that it ignores the relational aspect of the interaction between principals and agents but only focus on explicit contract designs (Wiseman et al. 2012). The behavioral theory of corporate government in contrast enables us to consider the agency relationship under a broader social context by explicitly taking into account “socially situated agency” and “socially constituted agency” in the term of Westphal and Zajac (2013). Specifically, our paper indicates that social exchange relationships not only affect motivations of agents (managers) but also those of supervisors (audit committees) in the three-tier agency framework. By incorporating this behavioral angle into the three-tier agency model, we are thus able to explore socially embedded nature of the principal-supervisor-agent relationship. We thus answer the call of Aguilera and Jackson (2010) to recognize “the socially embedded nature of actors, actor constellations, interests, and power relationships” in corporate governance.

Findings of this study also have important practical implications. Our empirical results suggest that the definition of an independent director that has been adopted by existing corporate governance regulations and the majority of empirical studies may oversimplify the relationship between boards of directors and firm managers. Even if a director is classified as independent based on his/her working history with the firm, i.e., the director is neither a current or previous employee nor a contractor of the firm, the director may still engage in social exchanges with top management of the firm and may not necessarily make independent decisions for shareholders' benefits (Johnson et al. 2013). As Westphal and Zajac (1997) state, “generalized norms of reciprocity... may represent a primary, social psychological mechanism

hindering increased board independence.” We capture the strength of this social relationship using committee members’ appointment time, tenure, and director compensation related to their employment relationship. Recent studies have also investigated this social exchange and network relationship reflected in other social dimensions, e.g., board members and CEOs belong to the same country club or graduated from the same school (e.g., Bruynseels and Cardinaels 2014; Fracassi and Tate, 2012a, b; Krishnan et al. 2011). As Westphal and Zajac (2013) argue, decisions of directors and executives are not made in a social vacuum, but rather shaped by social relationships, institutions, norms, and rules. As a result, considering the impact of social exchange and norms of reciprocity in a wider social context would undoubtedly be a fruitful direction for future corporate governance studies.

Our study also highlights the salience of the regulatory context in affecting audit committee effectiveness. We not only observe a significant increase in the number of financial restatements in the post-SOX period, but also notice a substantial change in the impact of audit committee characteristics on restatements in the post-SOX period. These results suggest that external regulations such as the SOX influence the institutional context that is crucial for the effectiveness of internal corporate governance mechanisms (Misangyi and Acharya 2014). As a formal institutional rule, regulatory environment not only affects investor protection and equity market valuation in the macro level (La Porta et al. 1998), but also shapes market participants’ perceptions, interests, and motivations in the micro level, and consequently influences choices of these socially embedded actors (Aguilera and Jackson 2010). For example, Gomulya and Boeker (2016) suggest that the passage of the SOX increases the level of concern and scrutiny directed at board members of fraud firms. As a result, inside board members and members appointed by the CEO are less likely to resist the replacement of CEOs in these fraud firms in the post-SOX period. We therefore recommend future corporate governance studies to explicitly take into account the influence of regulatory context and other institutional factors on the appropriate functioning of internal governance mechanisms.

With the diffusion of the Anglo–Saxon corporate governance model around the world, more and more countries are relying on audit committees to control firms’ financial reporting quality. Studies in other nations have found comparable results to those conducted in the U.S. context that audit committee structure and activities influence the quality of financial reporting and information disclosure. For example, Garcia et al. (2012) document that audit committee size and the number of audit committee meetings are both associated with reduced earnings management in Spain. Using a sample of Chinese firms, Lin et al. (2015) find that the efficacy of audit committees in constraining earnings management is influenced by the firm’s cross-listing status and the presence of government officials in the committee. Vlamincx and Sarens (2015) find evidence that audit committee quality measured by director independence and busyness both affect the magnitude of earnings management in the Belgian context. In contrast, the other scholars argue that corporate governance designs may not be equally effective in different nations. For example, van Essen et al. (2012)’s meta-analysis shows that board attributes that are identified as best governance practices such as board independence and the

separation of CEO and chairperson post only have very limited influence on financial performance of listed Asian firms. To gain additional insights on the boundary conditions of internal and external corporate governance mechanisms, it is therefore essential to further utilize this behavioural angle to explore what kind of formal and informal institutions may matter, in which context, and in which way.

Social exchange theory indicates that national culture may affect interpersonal relationships and the interpretation of social exchange (Homans 1961). Exploring the influence of social exchange relationship in various cultures or conducting a comparative study to examine this research topic in nations with distinct cultural roots could undoubtedly advance our understanding on the role of social exchange in influencing audit committee efficacy across cultures and increase generalizability of our research findings. In addition, institutional logics of governance may change overtime. Zajac and Westphal (2004) for example document that the agency logic has become more prevalent and legitimate among large U.S. firms since late 1980 s. Fiss and Zajac (2004) likewise show that German firms are more likely to accept the shareholder view of the firm starting from 1990 s. Adding a temporal dimension to the study of social exchange and social relationships would be valuable to explore how changes in institutional logics may affect interactions between top management, board members, and shareholders.

In conclusion, we believe our paper presents significant progress toward untangling the influence of social exchange relationships on the efficacy of audit committees. We suggest that although an audit committee bears a fiduciary duty to protect shareholder interests through the supervision of financial reporting processes, its effectiveness is constrained by committee members' social interactions with top management and shareholders. This study points to the importance of using multilevel frameworks that combine agency theory with the social exchange perspective to explicitly investigate motivations of audit committee members as the supervisor of management. Such a pluralistic approach will help deepen our understanding of the impact of social and behavioral factors on corporate governance. Therefore, in an effort to promote a better designed internal governance mechanism, more attention should be paid to study board members' social relationship and decision-making processes. As Sonnenfeld (2002) puts it: "What makes great boards great is not the rules and regulations. It is the way people work together."

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Appendix

See Table 10.

Table 10 Description of key variables

1	RESTATEMENT	1 if there is a restatement, and zero otherwise
2	APPOINT_AFTER	The proportion of audit committee members who are appointed after the CEO
3	NORMINATION	1 if there is a nomination committee in the main board; and 0 otherwise
4	AVE_TENURE	The sum of all audit committee members' board tenure divided by the committee size
5	ANNUAL_FEE	The average audit committee members' fees by serving on the board
6	AUDIT_SIZE	The number of directors sitting on an audit committee
7	SIZE_SQUARE	The square of audit committee size
8	EXPERT_RATIO	The number of financial experts on the committee divided by the committee size
9	AVE_AUDITSEAT	The sum of all audit committee members' external audit committee seats divided by the committee size
10	AVE_BOARDSEAT	The sum of all committee members' outside directorship divided by the committee size
11	MEET_NUM	The number of committee meetings
12	DUAL	1 if there is a combined CEO and chairperson position; and 0 otherwise
13	IND_RATIO	The ratio of independent directors sitting on the board
14	HISTORY	1 if the firm has experienced a restatement at any time in the previous 3 years and 0 otherwise
15	LOG_ASSETS	Natural log of total assets at the beginning of the restatement year
16	LOSS	1 if a firm has a net loss in the previous year; and zero otherwise
17	MB_RATIO	Market value divided by book value at the beginning of the restatement year
18	GROWTH	Average percentage change in net sales over the 3 years ending 1 year before the restatement

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