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Earnings Management of Firms Just Meeting Zero-earnings Thresholds: The Stakeholders' Perspective

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摘要：本文以兩項觀點（公司治理與審計品質將增加監控且降低盈餘管理之觀點，以及分析各利害關係人決策與企業決策關係之觀點），探討董事長兼任總經理、獨立董監事、機構法人持股與大型會計師事務所查核與零盈餘門檻操控行為之關係。實證結果顯示獨立董監席次比率及機構法人持股比率，皆與零盈餘門檻操控為顯著正相關，而審計品質（以四大會計師事務所查核衡量）及董事長兼任總經理則與零盈餘門檻操控間不存在顯著關聯。該實證結果傾向支持由利害關係人決策與企業決策觀點解釋企業零盈餘門檻操控行為。本文並以 Jacob and Jorgensen (2007) 之研究設計，發現台灣上市（櫃）公司存在會計年度年盈餘分配圖在零盈餘門檻附近存在不連續現象；另估計剛跨

越零盈餘門檻公司（小額正年盈餘公司組）之實質盈餘管理與異常裁量性應計數，兩項平均值皆不顯著異於零，該結果與本文主張零盈餘門檻操控為小金額損益操控之想法一致。

關鍵詞：利害關係人；避免損失；盈餘門檻；盈餘管理

Abstract：This paper aims to examine whether CEO-board chairperson duality, board independence, institutional holding, and audit quality affect earnings management behavior of firms that are just meeting zero-earnings thresholds. The empirical tests are based on the following two perspectives: the perspective that corporate governance and audit quality can constrain earnings management and the perspective of stakeholders' interests and firms' decisions. Our empirical findings suggest that firms with a higher proportion of independent board members and higher institutional shareholding are more likely to meet the zero-earnings thresholds through earnings management. However, we find insignificant results for CEO-board chairperson duality and audit quality. In summary, the findings support the perspective of the stakeholders' interests and the firms' decisions. In addition, we document the existence of discontinuities around zero-earnings thresholds in earnings distributions based on the methodology of Jacob and Jorgensen (2007). Also, discretionary accrual and real activities manipulation are insignificantly different from zero for firms just meeting zero-earnings thresholds, which supports our assumption that those firms are likely to involve only an insignificant amount of earnings management.

Keywords: Stakeholders' interest; Avoiding loss; Earnings threshold; Earnings management

1. Introduction

Schipper (1989) defines that earnings management is an act of intentionally influencing the process of financial reporting to obtain private gains. Healy and Wahlen (1999) indicate that earnings management occurs "when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic

performance of the firm, or to influence contractual outcomes that depend on reported accounting numbers." Empirical studies by Hayn (1995), Burgstahler and Dichev (1997), Degeorge, Patel and Zeckhauser (1999), and Jacob and Jorgensen (2007) find discontinuities in net income histograms regarding zero-earnings and earnings thresholds close to zero and attribute these findings to firms managing earnings in small amounts to meet zero-earnings thresholds when facing small losses.[3]

Kahneman and Tversky (1979) propose the prospect theory, which states that people choose among probabilistic outcomes that involve risks by evaluating outcomes as changes from a reference point, at which a kink transforms the overall curve of the utility function into an S shape.[4] According to the concept of reference points,[5] Scott (2011) asserts that prospect theory assumes loss aversion. Thus, starting at the breakeven point of the investment, the rate of utility loss for a loss in value is greater than the rate of utility increase for a gain in value. Degeorge, Patel and Zeckhauser (1999) report that if the preferences of the executives and the boards that review them, or the behavior of the investors who trade the company stocks are consistent with the prospect theory predictions, then the executives will have threshold-dependent compensation schemes and are likely to manage reported earnings to meet the thresholds that they wish to attain. According to the transaction cost theory, Burgstahler and Dichev (1997) maintain that, because it is costly for stakeholders to retrieve and process detailed company earnings information, the terms of transactions are generally more favorable for firms with earnings that are higher, rather than lower, than zero and for firms with positive change in earnings. In other words, earnings information affects the terms of transactions between firms and stakeholders. Degeorge, Patel and Zeckhauser (1999) describe the importance of thresholds from the perspective of

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[3] The discontinuities around zero in annual income histograms indicate that firms have manipulated their earnings to meet the thresholds (Hayn, 1995, last paragraph on p. 132; Burgstahler and Dichev, 1997, abstract; Jacob and Jorgensen, 2007, abstract and first paragraph on p. 370).

[4] Specifically, the curve of the utility function is convex for losses and concave for gains.

[5] According to the concept of reference points in prospect theory, Scott (2011) reports that assessing gains and losses separately is a form of psychological narrow framing; in other words, individual problem analysis is restricted to the decision-making psychology framework.

psychological effects and indicate that reporting gains is the most crucial threshold for firms.

Manipulating earnings around the zero-earnings threshold is a subtopic of earnings management. Such manipulation differs from other topics in earnings management in that the amounts involved in the manipulation process may be relatively small (Gunny, 2009; Graham, Harvey and Rajgopal, 2005).[6] Small, manipulated amounts around the zero-earnings threshold are difficult to detect because of high monitoring costs (Moeckel, 1990).[7] In addition, firms may manipulate the earnings around zero-earnings thresholds in small amounts through real activity manipulations (e.g., providing customers with price discounts and preferential credit terms to increase sales) or discretionary accrual estimates (e.g., bad debt estimates, inventory valuation losses, and useful life estimates for depreciation). Real activity manipulations entail actual firm transactions and executives would assert such transactions are the results of business decisions for the firm. In addition, a small amount of discretion in accrual estimates falls within the acceptable range when applying generally accepted accounting principles (GAAP).[8] Thus, firms are likely to engage in aggressive financial reporting when facing zero-earnings thresholds. Based on

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[6] The manipulation of small amounts around the zero-earnings threshold is discussed further in the subsection on real activities manipulations and accrual-based earnings management.

[7] The potential amounts hidden in each account by company executives through earnings management are small, making the confirmation of earnings management behaviors in each account difficult for auditors (Moeckel, 1990).

[8] Real activities manipulations, which affect firm cash flow, entail actual company transactions and may not violate GAAP. This problem is also indicated on p. 1048 of *iGAAP 2013: A Guide to IFRS Reporting*, which is published by Deloitte, one of the Big Four audit firms. Furthermore, discretionary accrual estimates typically satisfy an acceptable range. For example, when the estimated life for the depreciation of fixed assets is extended from 8 to 10 years, the rationality of such a change is evaluated according to range estimation rather than point estimation. Therefore, if it is within the acceptable estimation range as perceived by the auditors, the auditors may not object to such changes. As long as firms manage earnings within the acceptable range for accrual accounting estimates, the firms are considered compliant with GAAP regarding accounting discretion. Conversely, transactions such as fraudulent sales (typically involving accounts receivable and inventory) and fraudulent entries (e.g., in the US WorldCom Scandal, an expense for network maintenance was capitalized to inflate the earnings of the firm) are deemed illegal and to have violated GAAP even if the amounts involved are small.

prospect theory predictions, the consideration of transaction costs between firms and stakeholders, and the monitoring of such manipulation being costly or impossible, empirical verification is required to determine whether the argument that conventional corporate governance and audit quality can reduce earnings management effectively (Becker *et al.*, 1998; Klein, 2002; Peasnell, Pope and Young, 2005; Prencipe and Bar-Yosef, 2011; Hsu and Wen, 2015) applies to explaining earnings manipulations around the zero-earnings threshold.

Hambrick, Werder and Zajac (2008) indicate that corporate governance should be investigated from broader and more dynamic perspectives such as stakeholders' behaviors and the processes of these behaviors (Letza, Sun and Kirkbride, 2004; Hambrick, Werder and Zajac, 2008). Freeman's stakeholder theory proposes that company stakeholders, including chairpersons, chief executive officers (CEOs), directors, institutional owners, and auditors, share the intrinsic value of the firm (Freeman 1984). Therefore, firm decisions and stakeholder decisions influence each other (Freeman, 1984; Jones and Wicks, 1999).

We examined earnings management from a perspective that focused on the relationship between stakeholders and firm decisions. First, chairpersons who also act as CEOs possess multiple identities and thereby hold the greatest authority and influence over the board of directors (Hambrick, Werder and Zajac, 2008). When facing losses, these chairpersons may not actively manage earnings to meet zero-earnings thresholds because they bear relatively less supervisory or profit pressure. Secondly, small, manipulated amounts around the zero-earnings threshold that involve the aforementioned real activities or accounting discretions are difficult or impossible to monitor. Therefore, even independent professional directors may fail to uncover specific evidence to confirm the earnings management attempts of executives. Also, corporate loss aversion may be consistent with the interest of independent directors, such as avoiding attention and a loss of reputation from being the director of a company with losses.[9]

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[9] For example, the *Economic Daily News* (August 1, 2015) reports that the directors of 128 listed firms, including Wei Chuan, LCY Group, Asia Pacific Telecom, First Steamship Group, Asia Optical, Chainqui, BH Global, and Kinko Optical, received high remuneration, even though the

Thirdly, short-term institutional investors frequently predict the near-term profits of the firms they invest[10] in and to meet these predictions, executives exhibit a strong intention to manage earnings (Porter, 1992; Bushee 1998; Lin, 2001; Graham, Harvey and Rajgopal, 2005). Degeorge, Patel and Zeckhauser (1999) maintain that, if the preferences of executives and investors who trade company stocks are consistent with prospect theory predictions, then executives are likely to manage earnings to meet the thresholds they wish to attain. Finally, few studies explore whether behaviors involving earnings manipulations around the zero-earnings threshold differ between the audit clients of large audit firms and those of small audit firms. The empirical analysis of European listed firms by Van Caneghem (2004) addresses the tendency of the audit clients of the Big Five audit firms to round up the second digit of pretax incomes from nine to zero, revealing that a perspective based on audit quality does not explain behaviors involving earnings manipulations around the zero-earnings threshold.[11] As discussed, zero-earnings thresholds are manipulated through real activities or discretionary accrual measures. Small, manipulated amounts around the zero-earnings threshold are difficult or impossible to monitor, and consequently, firms may be facing environments favorable for aggressive active financial reporting.[12] Therefore,

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firms faced massive financial losses in 2014. The Central News Agency (January 31, 2012) reports the actual remuneration of the directors of listed firms in 2010 as reported by Taiwan Stock Exchange, in which 41 firms (including reputed firms) faced losses after taxes; however, the total and average payouts received by their directors increased. NOWnews (2008) reveals that numerous investors lost vast amounts of money and their faith in businesses in 2008 but that the directors of numerous listed firms facing losses in 2007 (e.g., Taishin Holdings lost up to NT$3 per share) still received nearly NT$10 million in annual pay.

[10] For example, Tseng (2011) reports in "No Profit This Year: Key Points in the Acer Investor Conference" that Acer's semiannual report showed a loss of NT$6.79 billion after tax in the second-quarter, which was the greatest single-quarter loss in the history of Acer and exceeded the corporation's predictions. According to "Avoiding the Pressure from Short-Term Stock Market Profit" in *CommonWealth Magazine* (No. 455, 2010), the supervisors of Burger King attempted to sell shares to private equity funds to avoid stock market pressure for short-term profits.

[11] In an empirical study, Van Caneghem (2004) indicates that the audit clients of the Big Five audit firms tend to round up the second digit of pretax incomes from nine to zero and referred to the behavior as an earnings rounding-up behavior.

[12] Using experimental research, Hackenbrack and Nelson (1996) report that auditors may have overlooked aggressive financial reporting, in which firms reported their earnings by adopting accounting methods they favored. Phillips (1999) maintains that this phenomenon may be

even large audit firms may not uncover substantive evidence to verify managers' attempts to manipulate earnings,[13] particularly for small amounts around the zero-earnings threshold.

Van Caneghem (2004) indicates that the relationship between audit quality and earnings management is an empirical issue. Similarly, we maintain that manipulating earnings around the zero-earnings threshold differs from general earnings management. In particular, the effects of chairpersons, CEOs, directors, institutional owners, and auditors on manipulating earnings around the zero-earnings threshold are fundamentally an empirical issue. Topics on corporate governance should be analyzed from perspectives that are broader and more dynamic. Therefore, two perspectives, one stressing that corporate governance and audit quality reinforce monitoring and reduce earnings management and one emphasizing the relationship between stakeholder and firm decisions, were employed to examine the relationship between earnings manipulations around the zero-earnings threshold on one hand, and CEO–chairperson duality, independent directors, institutional ownership, and big-4 accounting firms on the other.

The empirical results of our study indicate that the percentage of independent directors and the ratio of institutional shareholding are significantly positively correlated with manipulating earnings around the zero-earnings threshold; however, audit quality (using the Big-4 as a proxy) and CEO–chairperson duality are not associated with earnings manipulations around the threshold. These results differed from the assertion that conventional corporate governance mechanisms reduce earnings management effectively and supported the perspective that emphasized the relationship between stakeholder and firm decisions. Moreover, the results of additional tests based on the research design of Jacob and Jorgensen (2007) show discontinuities around zero in the fiscal year earnings histograms of Taiwanese listed as well as over-the-counter (OTC) firms, confirming that these firms managed their earnings to avoid reporting small losses. In addition, we

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caused by a corporate environment for aggressive financial reporting and the lack of experience by auditors.

[13] Phillips (1999) reports that GAAP contains numerous ambiguous principles that require immense and careful judgements by auditors. Therefore, auditors are often unable to identify evidence to confirm GAAP violations by the clients.

estimate that the means of real activities management and abnormal discretionary accruals for these firms are not significantly different from zero, which is consistent with our argument that manipulating earnings around the zero-earnings threshold involves manipulating small amounts of profits or losses.

The main contributions of this paper are listed as follows: (a) We investigate earnings manipulation around the zero-earnings threshold from both the perspective that emphasizes involving conventional corporate governance and audit quality and the perspective that stresses the relationship between stakeholder and firm decisions, thereby providing a broader and more dynamic analysis of corporate governance. (b) Few studies examine the relationship between corporate governance and earnings manipulation around the zero-earnings threshold, with most of these studies applying loss aversion (zero-earnings threshold) to explain changes in discretionary accruals.[14] Examining earnings manipulation around the threshold from the perspective of discretionary accruals has two disadvantages: The research design does not facilitate examining firms' real activities manipulation, and investigating manipulations involving small amounts using a model based on discretionary accruals may not be effective. Comparing two sets of data for firms facing a zero-earnings threshold avoids these two disadvantages. (c) An additional test based on the research design of Jacob and Jorgensen (2007) was conducted on the data of Taiwanese listed and OTC companies. The empirical results are consistent with the argument by Jacob and Jorgensen (2007) that discontinuities around zero in annual earnings histograms are not caused by scaling. These results improved on flaws in the studies in Taiwan that employed the model of Burgstahler and Dichev (1997), as well as those of studies on the relationship between loss aversion and earnings management. In summary, manipulating earnings around the zero-earnings threshold is a subtopic of earnings management and differs from earnings management conducted under other conditions. Furthermore, if the threshold is truly the reference point for the

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[14] According to the findings of Healy (1985), Yang and Wu (2003) and Tsai and Yang (2006) adopt operating cash flow as the proxy variables for earnings amounts before manipulation, reporting that the aversion of reporting annual losses (negative operating cash flow) and discretionary accruals are positively correlated.

value functions of stakeholders (e.g., executives, boards of directors, investors, and auditors), then understanding the behaviors of these firms enables the users of financial statements to understand information relating to annual earnings of these firms and to accumulate multifaceted empirical evidence in accounting studies.

The remainder of this paper is organized as follows: section 2 reviews the research hypotheses and literature; section 3 describes the research framework, including samples, models, and definitions of the variables; section 4 presents the empirical analyses, additional tests, and sensitivity analysis; and the final section concludes the paper.

2. Literature Review and Hypothesis Development

Prospect theory, proposed by Kahneman and Tversky (1979), describes how people evaluate results according to a reference point on the utility function when facing risky choices. Certain factors could cause the reference point to shift and to affect people's choices substantially, generating a kink at the reference point and transforming the entire curve into an S-shape curve. Accordingly, Scott (2011) attributed loss aversion behaviors to people's dislike of even the smallest losses. Therefore, beginning at the point where the investment begins to have small losses, the rate of utility loss is greater than the rate of utility gain experienced by investors when the investment begins to make small profits. Addressing the importance of thresholds from a psychological perspective, Degeorge, Patel and Zeckhauser (1999) listed three types of earnings thresholds,[15] with the most vital being the positive profits threshold. According to prospect theory, Degeorge, Patel and Zeckhauser (1999) maintain that, if a company executive intends to avert losses or if investors' share trading strategies are consistent with prospect theory predictions, then the executive will have a reward schedule based on the threshold and will likely manage earnings to meet the desired threshold. On the basis of transaction cost theory, Burgstahler and Dichev (1997) report that earnings

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[15] Degeorge, Patel and Zeckhauser (1999) addressed three types of thresholds: reporting positive profits, sustaining recent performance (i.e., maintaining the earnings of the previous year), and meeting the expectations of analysts.

information affects the terms of transactions between firms and stakeholders. Because it is costly for stakeholders to process earnings information, terms of transactions are generally more favorable for firms with earnings that are higher, rather than lower, than zero.

Hayn (1995), Burgstahler and Dichev (1997), Degeorge, Patel and Zeckhauser (1999), and Jacob and Jorgensen (2007) identify discontinuity around zero in earnings histograms, confirming the behaviors of firms involving the management of small amount earnings to avert small losses. Studies have typically maintained that sound corporate governance and high audit quality effectively constrain earnings management practices (Becker *et al.*, 1998; Klein, 2002; Peasnell, Pope and Young, 2005; Prencipe and Bar-Yosef, 2011; Hsu and Wen, 2015) by effectively reducing agency problems and preventing company managers from attempting to manage earnings.

Manipulating earnings around the zero-earnings threshold is a subtopic of earnings management and differs from other means of earnings management in that it may involve smaller amounts (Gunny, 2009; Graham, Harvey and Rajgopal, 2005). Monitoring small, manipulated amounts around the zero-earnings threshold is costly and difficult (Moeckel, 1990). Moreover, firms may manipulate small amount of earnings around the threshold through real activity manipulations (e.g., providing customers with price discounts and preferential credit conditions to increase sales) or discretionary accrual estimates (e.g., bad debt estimates of accounts receivables, allowances to reduce inventory, and useful life estimates for depreciation). Because real activity manipulations entail actual company transactions, managers may consider such transactions to be the result of managing business decisions for firms. In addition, the discretionary accrual estimates can be compliant with GAAP. Therefore, firms are prone to aggressive financial reporting when facing situations around the zero-earnings threshold. Based on prospect theory predictions, the consideration of transaction costs between firms and stakeholders, and the monitoring of such manipulation being costly or impossible, empirical verification is required to determine whether the argument that conventional corporate governance and audit quality can inhibit earnings management effectively applies to reducing earnings manipulations

around the zero-earnings threshold.

We attempt to explain behaviors involving the manipulation of earnings around the zero-earnings threshold from the perspective that emphasizes the relationship between stakeholder and firm decisions, in addition to analyzing the aforementioned studies according to conventional corporate governance. Letza, Sun and Kirkbride (2004) categorize current perspectives on corporate governance in two contrasting paradigms: the shareholding perspective, which regards the corporation as a legal instrument that enables shareholders to maximize their own interests (i.e., investment returns), and the stakeholding perspective, which views the corporation as the locus of wider, external stakeholder interests (O'Sullivan, 2000; Friedman and Miles, 2002). Hambrick, Werder and Zajac (2008) report that corporate scandals have caused increases of interest in corporate governance among researchers from many fields. Studies on corporate governance indicate that corporate governance should be examined from broader and more dynamic perspectives such as stakeholders' behavior and behavioral processes (Hambrick, Werder and Zajac, 2008; Letza, Sun and Kirkbride, 2004). Proposed by Freeman (1984), stakeholder theory describes the relationship between the functions of firms and stakeholders, with stakeholders being defined as groups or individuals that affect or are affected by an organization, strategy, and project. Brenner and Cochran (1991) use stakeholder theory to explain organizations' approaches to operation and to predicting their future behaviors. Freeman (1984) defines chairpersons, CEOs, directors, institutional owners, and accountants as the "stakeholders of firms." Each stakeholder possesses an intrinsic value in the firm, and their decisions affect or are affected by the firm's decisions (Freeman, 1984; Jones and Wicks, 1999). Organizations and stakeholders share dynamic relationships and influence each other through gains and losses, as well as rights and responsibilities (Evan and Freeman, 1988).

From the stakeholder perspective, we investigate the response of each company stakeholder to behaviors of managers involving the manipulation of earnings around the zero-earnings threshold to avert losses. When the cost effectiveness of the manipulation is considered (as described in the remainder of

this paper), stakeholders may not possess specific evidence that verifies the earnings management of firms to meet the threshold; in addition, such loss aversion may be in line with stakeholders' interests.

Adopting both the perspective that stresses conventional corporate governance and the perspective that emphasizes the relationship between stakeholder and firm decisions, we examine and develop hypotheses regarding the relationship between behaviors involving earnings manipulations around the zero-earnings threshold and CEO–chairperson duality, independent directors, institutional ownership of shares, and large audit firms.

First, the effect of CEO–chairperson duality is analyzed. Williamson (1985) stresses that an executive is one of the most vital and influential members in a firm and may intentionally or unintentionally adopt opportunism and self-reinforcing behaviors. The board of directors, another group of stakeholders in a company, controls managerial behaviors by monitoring and influencing strategic decision making (Hillman, Nicholson and Shropshire, 2008; Johnson, Daily and Ellstrand, 1996).[16] In examining the power and influence within the boardroom, Hambrick, Werder and Zajac (2008) explain that some directors are more influential than others and that the chairperson possesses the greatest power. If the chairperson is also the CEO, conflict may exist between the two identities regarding their functions. Hillman, Nicholson and Shropshire (2008) maintain that directors with multiple identities possess the flexibility to manage nonroutine problems but also encounter conflict among identities. If the identities of an organizational member are related and aligned, then multiple identities can benefit the organization. Conversely, if these identities compete with one another, identity multiplicity becomes costly and can be detrimental to an organization. On the basis of agency theory, Hillman, Nicholson and Shropshire (2008) suggest that directors who strongly identify with their role as chairperson hesitate to demonstrate monitoring behavior because they resent such behavior from their own board of directors. According to stewardship theory, Davis, Schoorman and

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[16] Directors have four functions: monitoring managerial behaviors of executives, advising and counseling organizations, safeguarding critical organization resources, and influencing decision making.

Donaldson (1997) indicate that such chairpersons [17] support monitoring reductions because they consider themselves to be their organization's "steward" and confer such a function on their role as CEO.

Studies on CEO–chairperson duality typically indicate that chairpersons may use their power questionably for their own personal interests (Finkelstein and D'Aveni, 1994). Such CEO–chairperson duality weakens the monitoring function of boards of directors and thus encourages more earnings management behaviors (Dechow, Sloan and Sweeney, 1996; Chen and Yeh, 2002). Klein (2002) maintains that separating the roles of the board and the CEO facilitates improving corporate governance and constrains the intention of executives to manage earnings. Chen and Liu (2010) and Kumari and Pattanayak (2014) indicate that an absence of CEO–chairperson duality prevents executives from managing earnings. With CEO–chairperson dual identities, board independence and monitoring functions are weakened, and the CEO identity becomes responsible for firm performance (Wang and Dewhirst, 1992). To safeguard jobs, respond to profit pressure, and fulfill remuneration plans, such chairpersons may be prompted to manipulate earnings around zero-earnings thresholds to avoid losses. However, from another perspective, these chairpersons possess the greatest power and influence because of their multiple identities (Hambrick, Werder and Zajac, 2008). Therefore, when facing losses, a chairperson may choose not to actively manipulate earnings around the threshold because of the relatively low monitoring and profit pressure suspicions from the board of directors.

Facing zero-earnings thresholds, a firm's earnings manipulation behavior by its chairperson–CEO may be complicated by conflict between the chairperson's dual identities or by the chairperson's power and influence over the board of directors. Without predicting the behavior's orientation, we verify its influence through empirical tests involving the following hypothesis:

Hypothesis 1: CEO–chairperson duality is associated with earnings manipulation around the zero-earnings threshold.

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[17] According to Davis, Schoorman and Donaldson (1997), stewardship theory defines situations in which managers are not motivated by individual goals but rather situations in which they are stewards whose motives are aligned with the objectives of their principals.

Fama and Jensen (1983) maintain that outside directors enhance the board of directors' effective monitoring over the company's executives; rather than collude with the company's executives to expropriate residual claimants, they protect their reputation as an independent expert in decision control. Studies typically report that outside directors are negatively correlated with earnings management. Klein (2002) and Xie, Davidson and DaDalt (2003) indicate that corporate board independence reduces earnings management. In exploring managers' motivations for managing earnings, Peasnell, Pope and Young (2005) report that an increase of outsiders on the board reduces the likelihood of executives generating income-increasing abnormal accruals to avoid reporting both losses and earnings reductions. Uadial (2012) indicates that outside directors provide an operating firm with experience that is more multifaceted and greater monitoring power over executives, thereby reducing the likelihood of earnings management.

From another perspective, Hambrick, Werder and Zajac (2008) maintained that, although most studies on corporate governance facilitate a clearer understanding of executives' motivations and behaviors to rise to a firm's upper echelons (wealth, power, and prestige being most obvious) (Graffin *et al.*, 2008),[18] few studies explore outside directors' motivations for serving on boards. Hambrick, Werder and Zajac (2008) further elaborate that board activities include numerous repetitive and nonprofessional routines. In times of corporate success, little credit is accrued to the directors; in times of difficulty, the directors are faced with the cumbersome task of replacing CEOs and an increased risk of lawsuits, attacks from the press, and stigma (Wiesenfeld, Wurthmann and Hambrick, 2008). From the perspective based on corporate governance, Hambrick, Werder and Zajac (2008) indicate that the responsibility of the board is to provide managers with professional advice on decision making and to ask critical questions about the risks of strategic plans. However, anecdotal evidence shows that such controversial and candid discussions rarely occur in boardrooms; instead, a class of group processes, including groupthink (Janis 1972), undiscussability (Argyris 1985), and pluralistic ignorance (Westphal and Bednar 2005) often prevail,

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[18] Graffin *et al.* (2008) show in their study how executives under specific circumstances benefit from the celebrity status of their CEOs.

preventing board members from asking tough questions.

When company managers inappropriately (e.g., making fictitious sales) or excessively (e.g., discretionary accrual estimates exceeding acceptable ranges) manipulate earnings to evade losses, independent directors oppose such manipulation to protect the benefits of shareholders and avoid lawsuits and loss of reputation. However, the amounts involved in manipulating earnings around the zero-earnings threshold may be small (Gunny, 2009; Graham, Harvey and Rajgopal, 2005) and difficult to detect (Moeckel, 1990). In addition, a manager may maintain that earnings manipulations through real activities result from business decisions, and earnings manipulations through discretionary accrual estimates that fall within the acceptable range of GAAP are difficult or impossible to detect. Consequently, even expert independent directors may not uncover specific evidence that confirms executives' earnings management or manipulations of small amounts around the zero-earnings threshold. Furthermore, board decisions may not be implemented effectively. In difficult times, independent directors may endure both attacks from the press and damage to their reputations; avoiding the reporting of losses may satisfy the interests of these directors.

We maintain that manipulating earnings around the zero-earnings threshold differs from general earnings management. Although a high ratio of independent directors may restrain the occurrence of earnings management according to conventional corporate governance studies, they may not be as effective at preventing earnings manipulations around the zero-earnings threshold. Moreover, because detecting such manipulations is difficult or impossible and because avoiding the reporting of losses may fit the interests of these directors (to avoid press attacks and acquiring the reputation of being the director of a firm with losses), boards of directors may avoid reporting such manipulations. Consequently, the percentage of independent directors may not be negatively correlated with the likelihood of manipulating earnings around the zero-earnings threshold. Hence, the empirical models of this study examined the following hypothesis:

Hypothesis 2: The percentage of independent directors is associated with the manipulating earnings around the zero-earnings threshold.

Pfeffer and Salancik (1978) proposed resource dependence theory to explain that organizations rely on the resources owned by various stakeholders to operate (Clarkson, 1995; Rowley and Berman, 2000). Specifically, to safeguard their own interests, stakeholders use their resources to sanction—reward or punish—their own companies to change or reinforce their behaviors (Rowley and Berman, 2000, p. 409). Clarkson (1995) indicates that, without the continuing participation of primary stakeholders, who typically consist of shareholders and investors,[19] enterprises cannot survive.

Institutional owners, those who are a company shareholder and a primary stakeholder, are often characterized as sophisticated investors who have advantages over individual investors in acquiring and processing value-relevant information (Hand, 1990; Jiambalvo, Rajgopal and Venkatachalam, 2002). Dechow, Sloan and Sweeney (1996) and Chung, Firth and Kim (2002) maintain that institutional investors can use their monitoring ability to effectively reduce agency problems and earnings management by executives. Cornett, McNutt and Tehranian (2009) find that the institutional ownership of shares reduces discretionary accrual-based earnings management. In addition, Jiang and Anandarajan (2009) and Jalil and Rahman (2010) indicate that institutional shareholding mitigates aggressive earnings management and improves the quality of accounting information. However, other studies maintain that institutional investors are transient owners[20] who are overly focused on short-term earnings and thus may pressure executives to report consistently higher earnings, even by abusing accounting discretions (Bushee, 1998; Graham, Harvey and Rajgopal, 2005). Institutional owners typically predict the short-term earnings of companies, with company executives attempting to fulfill their stock market predictions.

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[19] Clarkson (1995) defines primary stakeholders as shareholder and investors, customers, employees, and suppliers and secondary stakeholders as communities and the corporate environment.

[20] Hambrick, Werder and Zajac (2008) address heterogeneity among shareholders and maintain that conflicts of interest often occur between short-term orientated investors and long-term orientated investors. Typically, short-term oriented investors are more vocal than long-term oriented investors and exert their influence through the press and other social intermediaries.

Porter (1992) and Lin (2001) report that the institutional ownership of shares pressures executives to attain short-term profit goals, thus increasing their motivation to manage earnings. In an empirical study on electronics firms in Taiwan, Lin (2001) finds that firms with higher institutional ownership of shares generate higher discretionary accruals; similar findings are identified by Al-Fayoumi, Abuzayed and Alexander (2010).

The two aforementioned perspectives are used to analyze the effect of the institutional ownership of shares on manipulating earnings around the zero-earnings threshold. One of the perspectives indicates that aggressive monitoring by institutional owners can reduce agency problems and earnings management and is therefore negatively correlated with manipulating earnings around the zero-earnings threshold. The other perspective maintains that institutional owners are short-term investors who may pressure company executives to achieve profit goals. Degeorge, Patel and Zeckhauser (1999) report that the preferences of executives and investors who trade company shares are consistent with prospect theory predictions. Therefore, the institutional ownership of shares is positively correlated with earnings manipulation around the zero-earnings threshold. The effect of the institutional ownership of shares on earnings manipulation around the zero-earnings threshold is an empirical issue. We did not predict the orientation of such an effect. The third hypothesis in this study was formulated as follows:

Hypothesis 3: Institutional ownership is associated with the manipulating earnings around the zero-earnings threshold.

Previous studies consider the audit quality of the Big Four audit firms to be superior to that of small audit firms and maintain that large audit firms effectively reduce agency problems and earnings management (Becker *et al*., 1998; Bradshaw, Richardson and Sloan, 2001). Another perspective, which corresponds with the basis of Hypothesis 2, indicates that the amounts involved in manipulating earnings around the zero-earnings threshold may be small (Gunny, 2009; Graham, Harvey and Rajgopal, 2005) and difficult to detect (Moeckel, 1990). Executives may regard real activities earnings management to result from

business decisions, and earnings manipulations through discretionary accrual estimates that are compliant with the acceptable range of GAAP are difficult or impossible to monitor. Therefore, even large audit firms may find it difficult to uncover specific evidence to confirm executives' earnings management and small, manipulated amounts around the zero-earnings threshold. Consequently, audit quality, indicative for constraining earnings management, may not be as effective in mitigating earnings manipulations around the zero-earnings threshold. Few studies investigate differences in the behavior of the audit clients of large audit firms and those of small audit firms regarding earnings manipulation around the zero-earnings threshold. An empirical study by Van Caneghem (2004) on listed firms in Europe shows that the audit clients of the Big Five audit firms tend to round up the second digit of pretax earnings from nine to zero, thereby indicating that higher audit quality is even associated with higher likelihood of earnings manipulation around the threshold.

This study aims to expand empirical evidence on differences in the behavior of the audit clients of large audit firms and those of small audit firms regarding earnings manipulation around the zero-earnings threshold. Similar to Van Caneghem (2004), we maintain that the relationship between large audit firms and earnings manipulations around the zero-earnings threshold is an empirical problem. Studies on conventional audit quality maintain that large audit firms effectively constrain earnings management. However, these firms may not be as effective in preventing earnings manipulation around the threshold; they may not uncover specific evidence verifying the earnings management behaviors of company executives aimed at avoiding small losses. Therefore, audit quality may not be negatively correlated with manipulating earnings around the zero-earnings threshold. Without predicting the orientation of such an effect by audit quality, we establish the fourth hypothesis in this study as follows:

Hypothesis 4: Audit quality is associated with manipulating earnings around the zero-earnings threshold.

3. Research Design

3.1 Research Samples

We collected the data used in this study from the database (DB) of the *Taiwan Economic Journal* (*TEJ*). Particularly, we collected single-quarter and year-to-date financial statements and auditor information (from the TEJ Finance DB), equity market capitalization data (from the TEJ Equity DB), and corporate governance data (from the TEJ corporate governance DB). The sample period was constrained by the fact that the TEJ quarterly audit firm information DB is more complete starting from 1999. Using the research method of Jacob and Jorgensen (2007), we calculated the earnings for annual periods ending at various fiscal quarters. Thus, the first annual end date in the samples is the first quarter of 1999.[21] Therefore, the samples range from the second quarter of 1998 to the fourth quarter of 2011 for a total of 55 quarters.[22]

We began with firm-year observations for all the firms listed on the Taiwan Stock Exchange and the Gre Tai Securities Exchange. From these, we excluded the following firm-year observations: (a) firms with fiscal year end different from December were excluded. (b) Firms belonging to specific industries such as finance, securities, and insurance industries were excluded. (c) Firms with discontinuities in quarterly data and missing values in the financial, audit firm, equity market capitalization, and corporate governance information were eliminated. According to the annual earnings measurement method of Jacob and Jorgensen (2007), the samples were further divided into the fiscal annual earnings group (i.e., total earnings from the first quarter to the fourth quarter) and the

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[21] The annual earnings period ending in the first quarter of 1999 begins from the second quarter of 1998.

[22] The International Financial Reporting Standards (IFRS) became fully effective in Taiwan in 2013. To compare financial statements, the Taiwan Financial Supervisory Commission specifies that crucial differences between pre-IFRS accounting policies and the IFRS accounting policy and amounts significant affected on crucial items must be provided regarding financial statements from the year preceding the year that the IFRS became effective. Financial statements in 2012 were under a dual-track system, the ROC GAAP system and the IFRS system. Therefore, all of the samples in this study were obtained solely from the ROC GAAP period, which ended in the fourth quarter of 2011.

nonfiscal annual earnings group (i.e., total earnings from the second quarter to the first quarter of the following year, from the third quarter to the second quarter of the following year, or from the fourth quarter to the third quarter of the following year). Among the 3,603 firm-year data around the zero-earnings threshold,[23] including those sample with small profits or small losses,[24] 962 data points belonged to the fiscal group, and 2,641 belonged to the nonfiscal group.[25]

3.2 Research Model

The behaviors of firms that involved the manipulation of annual (fiscal and nonfiscal) losses around the zero-earnings threshold were examined. The Probit model was used to analyze the effect of CEO–chairperson duality, independent directors, institutional owners, and audit quality on earnings manipulations around the zero-earnings threshold in the aforementioned samples to avert annual losses, as follows:

$$
\begin{aligned}
EM_{it} = {} & \delta_0 + \delta_1 DD1_{it} + \delta_2 DD2_{it} + \delta_3 DD3_{it} + \delta_4 DUAL_{it} + \delta_5 DUAL_{it} * FY_{it} + \delta_6 IND_{it} \\
& + \delta_7 IND_{it} * FY_{it} + \delta_8 INS_{it} + \delta_9 INS_{it} * FY_{it} + \delta_{10} SIZE_{it} + \delta_{11} SIZE_{it} * FY_{it} \qquad (1) \\
& + \delta_{12} LEV_{it} + \delta_{13} LEV_{it} * FY_{it} + \delta_{14} PREROE_{it} + \tau_{it}
\end{aligned}
$$

where EM_{it}, which is a proxy variable that denotes manipulating earnings around the zero-earnings threshold, is a dummy variable that takes the value one for a firm-year observation with small annual positive earnings and zero for a firm-year observation with small annual negative earnings; $DD1_{it}$ is a dummy variable that takes the value one when company i is audited by the Big Four audit firms and the

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[23] Initially, the number of samples of firms around the zero-earnings threshold was 4,913 data points (discussed in defining the dependent variable EM_{it} in the "Research Model" section). However, the variable for measuring firm performance ($PREROE_{it}$) is the average return on equity in the previous 5 years; therefore, the number of samples was reduced to 3,726 data points. Eliminating the extreme $PREROE_{it}$ values (two samples outside the range of the standard deviation) further reduced the number to the final 3,603 data points.

[24] The research method of Jacob and Jorgensen (2007) is discussed in the "Additional Tests" section, part of which describes the annual earnings histograms.

[25] The 2,641 data points in the nonfiscal annual earnings group included 866 data points on total annual earnings from the second quarter to the first quarter of the following year, 861 data points from the third quarter to the second quarter of the following year, and 914 data points from the fourth quarter to the third quarter of the following year.

firm-year belongs to the fiscal group at period t, and zero otherwise; $DD2_{it}$ is a dummy variable that takes the value one when company i is not audited by the Big Four audit firms and the firm-year belongs to the nonfiscal annual earnings group at period t, and zero otherwise; $DD3_{it}$ is a dummy variable that takes the value one when company i is audited by the Big Four and the firm-year belongs to the nonfiscal group at period t, and zero otherwise; $DUAL_{it}$ is a dummy variable taking the value one if CEO is the President, and zero otherwise; IND_{it} is the proportion of independent directors on the board at period t; INS_{it} is the shareholdings of institutional shareholders at the period t; $SIZE_{it}$ is the natural logarithm of market value of equity at the period t; LEV_{it} is the ratio of total liability to total assets at the period t; FY_{it} is a dummy variable taking the value one when company i does not belong to the nonfiscal group at period t, and zero otherwise; $PREROE_{it}$ is the mean of return of equity (net income/average equity) over the past five years.

The dependent variable EM_{it} distinguishes the firms with small annual positive earnings from those with small annual negative earnings around the threshold. The firms with small losses did not meet the threshold, but those with small gains may have met it through earnings management. To select the firms around the threshold, an earnings histogram was plotted according to the research design of Jacob and Jorgensen (2007) (discussed in the "Additional Test" section, part of which describes the annual earnings histogram). On the basis of the differences between the annual earnings frequency ratios and the expected frequency ratios, z values were determined and used to select firms in the three partitions below the threshold (i.e., Partitions -2–0) as the firms with small annual negative earnings and firms in the three partitions above the threshold (i.e., Partitions 1–3) as the firms with small annual positive earnings. The group with small profits was designated as the proxy for earnings management. However, because the group may also include firms that did not manage earnings, errors may exist in the variable. Whether the error negatively affects the empirical results can be determined by examining whether it is biased against the conclusion or not. If it is biased against the conclusions, the error can be adjusted to turn it in favor of the conclusions; therefore, the empirical results are still valid

even if the bias is not adjusted.[26] In this study, the potential error in the proxy variable for earnings management should not have affected the empirical results because the potential error would have been biased against the conclusions. In addition, most studies adopting discretionary accruals estimates as proxy variables for earnings management exhibit measurement errors (referenced in the discussion by Kothari, Leone and Wasley, 2005).

Das and Shroff (2002) and Gu, Lee and Rosett (2002) indicate that earnings management behaviors are concentrated in the fourth quarter of each year. Dichev and Skinner (2002) report that executives are unlikely to manage income for annual periods other than the fiscal year for capital markets and other contractual reasons. Jacob and Jorgensen (2007) maintain that nonfiscal annual earnings are less likely to be influenced by earnings management than fiscal annual earnings and support the argument by using nonfiscal annual earnings histograms. Therefore, we did not predict that our hypotheses can explain the patterns of nonfiscal annual earnings. Although the nonfiscal group was included for comparison, Model (1) was designed to verify the study's hypotheses regarding the fiscal annual earnings group.

In Model (1), audit quality (Big Four or non-Big Four) and annual earnings measurements were employed to establish three dummy variables, namely *DD1*$_{it}$ (Big Four audit firms, fiscal group), *DD2*$_{it}$ (non-Big Four, nonfiscal group), and *DD3*$_{it}$ (Big Four, nonfiscal group), which were used to examine the relationship between audit quality and manipulating earnings around the zero-earnings threshold. The coefficient δ_1 represents the incremental effect of Big Four on earnings manipulated around the zero-earnings threshold in the fiscal group.[27] If δ_1 is significantly different from zero, then the audit quality is associated with the large audit firms for the fiscal group, confirming Hypothesis 4.

In Model (1), if δ_4 is significantly different from zero, then CEO–

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[26] This argument is based on the testing of the effect of measurement errors on empirical results by Rajgopal, Shevlin and Venkatachalam (2003, p. 481, tenth line).

[27] Similar tests (H_0: $\delta_2 = \delta_3$) can be applied for comparing the effects of the Big Four audit with that of the non-Big Four audit on earnings manipulation around the threshold for the nonfiscal group. However, because nonfiscal annual earnings are not the target of earnings management, we do not anticipate that Hypotheses 1–4 apply to the nonfiscal group, thus conducting no further testing of that group.

chairperson duality is associated with earnings manipulation around the threshold for the fiscal group, confirming Hypothesis 1. If δ_6 deviates significantly from zero, then the percentage of independent directors is associated with earnings manipulation around the threshold for the fiscal group, confirming Hypothesis 2. If δ_8 deviates significantly from zero, then the institutional shareholding ratio is associated with earnings manipulation around the threshold for the fiscal group, confirming Hypothesis 3. The coefficients δ_5, δ_7, and δ_9 represent the incremental effects of CEO–chairperson duality, the percentage of independent directors, and the shareholding ratio of institutional owners in the firms for the nonfiscal group; if δ_i ($i = 5$, 7, 9) deviates significantly from zero, then the incremental effects are confirmed.

Regarding the control variables in Model (1), studies indicate that firm sizes and financial leverages are associated with earnings management (DeFond and Park, 1997; Becker *et al*., 1998), with firm size being used as a proxy for some of the missing variables (Becker *et al*., 1998). Therefore, firm size ($SIZE_{it}$) and financial leverage (LEV_{it}) are included in this study as control variables. In addition, more satisfactory performance is exhibited by the firms to the right of the threshold than by those to the left. More satisfactory firm performance can be mis-attributed to favorable audit quality or corporate governance, causing selection bias in the empirical results. Therefore, the average return on equity in the preceding 5 years ($PREROE_{it}$) was adopted in Model (1) as a control variable for firm performance.[28]

4. Empirical Analysis

4.1 Basic Statistical Analysis of the Variables

Table 1 lists the descriptive statistics of the model variables. The overall mean of EM_{it} is 58%; however, it is 69% in the fiscal group and 54% in the nonfiscal group (information not listed). Regarding the fiscal group, 69% of the

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[28] *PREROE_{it}* was also applied as a control variable for firm performance; the empirical results are consistent with the conclusion of this paper.

Table 1
Descriptive Statistics

ariable	Mean	Medium	Std. Dev.	Maximum	Minimum
EM_{it}	0.5765	1	0.4942	1	0
$DD1_{it}$	0.2048	0	0.4036	1	0
$DD2_{it}$	0.1621	0	0.3686	1	0
$DD3_{it}$	0.5709	1	0.4950	1	0
$DUAL_{it}$	0.2984	0	0.4576	1	0
$DUAL_{it} * FY_{it}$	0.2193	0	0.4138	1	0
$IND_{it}(\%)$	4.0369	0	9.0685	50.0000	0
$IND_{it} * FY_{it}(\%)$	2.8420	0	7.8533	50.0000	0
$INS_{it}(\%)$	29.8813	26.2300	19.0395	92.9600	0.0100
$INS_{it} * FY_{it}(\%)$	22.0061	18.0500	21.0243	92.9600	0
$SIZE_{it}$	7.5939	7.4719	1.1440	13.4300	4.4886
$SIZE_{it} * FY_{it}$	5.5820	7.0130	3.5098	13.1896	0
$LEV_{it}(\%)$	36.6790	37.4032	16.1281	91.5196	1.0105
$LEV_{it} * FY_{it}(\%)$	26.8832	28.4769	21.2748	91.5196	0
$PREROE_{it}(\%)$	0.3008	1.3951	8.8266	28.3306	-31.4416

Note: EM_{it} which is a proxy variable that denotes manipulating earnings around the zero-earnings threshold, is a dummy variable that takes the value 1 for a firm-year observation with small annual positive earnings and 0 for a firm-year observation with small annual negative earnings; $DD1_{it}$ is a dummy variable that takes the value 1 when the company i is audited by the Big Four audit firms and the firm-year belongs to the fiscal group during t, and 0 otherwise; $DD2_{it}$ is a dummy variable that takes the value 1 when the company i is not audited by the Big Four audit firms and the firm-year belongs to the nonfiscal group during t, and 0 otherwise; $DD3_{it}$ is a dummy variable that takes the value 1 when the company i is audited by the Big Four and the firm-year belongs to the nonfiscal group during t, and 0 otherwise; $DUAL_{it}$ is a dummy variable taking the value 1 if CEO is the President and 0 otherwise at the period t; IND_{it} is the proportion of independent directors on the board at period t; INS_{it} is the shareholdings of institutional shareholders at the period t; $SIZE_{it}$ is the natural logarithm of market value of equity at period t; LEV_{it} is the ratio of total liability to total assets at the period t; FY_{it} is a dummy variable taking the value 1 when company i does not belongs to the nonfiscal group at period t, 0 otherwise; $PREROE_{it}$ is the mean of return of equity (net income/average equity) over the past five years. (3,603 firm-year observations)

firms show small gains, whereas 31% of them show small losses, indicating that the discontinuity around zero in the fiscal annual earning histogram was apparent. Conversely, in the nonfiscal group, the ratio of firms with small gains (54%) to those with small losses (46%) is nearly equal; thus, the discontinuity is not apparent. Nearly 80% of the samples are clients of the Big Four audit firms: 20% from the fiscal group ($DD1_{it}$) and 57% from the nonfiscal group ($DD3_{it}$); approximately 16% of the samples are clients of non-Big Four audit firms from

the nonfiscal group. The mean of $DUAL_{it}$ is .2984, indicating that nearly 30% of the firms' chairpersons are also the CEOs; the mean of INS_{it} is 29.8813%; the percentage of independent directors shows a mean, maximum, and minimum of 4.0469%, 50%, and approximately 0%, respectively; LEV_{it} shows a maximum, minimum, and mean of 91.5196%, 1.0105%, and 36.6790%, respectively; $SIZE_{it}$ shows a maximum, minimum, and mean of 13.4300, 4.4886, and 7.5939, respectively; and the mean, median, maximum, and minimum of $PREROE_{it}$ are .3008%, 1.3951%, 28.3306%, and -31.4416%, respectively.

Table 2 shows the correlation coefficient matrix of the model variables. Regarding the Big Four audit firms, $DD1_{it}$ is significantly positively correlated with EM_{it} (0.1219), and $DD3_{it}$ is significantly negatively correlated with EM_{it} (-0.1189); these results indicate that the Big four audit firms are positively correlated with earnings manipulation around the threshold in the fiscal group.[29] $DUAL_{it}$ and EM_{it} are insignificantly negatively correlated in the fiscal group (however, the Spearman coefficient is a significant -.0219) and significantly negatively correlated in the nonfiscal group (-.0711; the Spearman coefficient = -.0712). IND_{it} and EM_{it} are insignificantly positively correlated; $IND_{it}*FY_{it}$ and EM_{it} are significantly negatively correlated in the nonfiscal group (-.0434; the Spearman coefficient = -0.0483); INS_{it} and EM_{it} are significantly positively correlated for the fiscal group (.0551; Spearman coefficient = .0520); $INS_{it}*FY_{it}$ and EM_{it} are significantly negatively correlated (-.0489; Spearman coefficient = -.0770); $PREROE_{it}$ and EM_{it} are significantly positively correlated (.0482; Spearman coefficient = .0527); and $PREROE_{it}$ is significantly correlated with $DUAL_{it}$, IND_{it}, and INS_{it}, thus rendering it a required control variable in Model (1).

4.2 Empirical Results

Table 3 illustrates the empirical results of the relationship between manipulating earnings around the zero-earnings threshold and CEO-chairperson

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[29] The correlation coefficient between $DD2_{it}$ and EM_{it} is insignificant and negative.

Table 2
Correlation Matrix

	EM_{it}	$DD1$	$DD2$	$DD3$	$DUAL_{it}$	$DUAL_{it}*FY_{it}$	IND_{it}	$IND_{it}*FY_{it}$	INS_{it}	$INS_{it}*FY_{it}$	$SIZE_{it}$	$SIZE_{it}*FY_{it}$	LEV_{it}	$LEV_{it}*FY_{it}$	$PREROE_{it}$
EM_{it}	1	0.1219***	-0.0040	-0.1189***	-0.0291*	-0.0712***	0.0003	-0.0483***	0.0520***	-0.0770***	0.0243	-0.0984***	-0.0397**	-0.1350***	0.0527***
$DD1$	0.1219***	1	-0.2232***	-0.5854***	-0.0078	-0.2690***	0.0451***	-0.1967***	0.0016	-0.6506***	-0.0269	-0.6506***	-0.0071	-0.6506	-0.0079
$DD2$	-0.0040	-0.2232***	1	-0.5073***	0.0309*	0.1182***	-0.0688***	-0.0079	-0.0298*	0.1807***	0.0209	0.2139***	-0.0007	0.2051	-0.0153
$DD3$	-0.1189***	-0.5854***	-0.5073***	1	-0.0205	0.1979***	0.0224	0.2149***	0.0343*	0.5570***	0.0146	0.5322***	0.0003	0.5388***	0.0300*
$DUAL_{it}$	-0.0291	-0.0078	0.0309	-0.0205	1	0.8127***	0.0478***	0.0535***	-0.1412***	-0.0668***	-0.0897***	-0.0479***	-0.0423*	-0.0218	-0.1092***
$DUAL_{it}*FY_{it}$	-0.0711***	-0.2689***	0.1182***	0.1978***	0.8127***	1	0.0400**	0.1332***	-0.0983***	0.1712***	-0.0642***	0.1921***	-0.0356*	0.2210***	-0.0911***
IND_{it}	0.0038	0.0405***	-0.0639***	0.0215	0.0406**	0.0360**	1	0.8183***	-0.1213***	-0.0895***	-0.1004***	-0.0508***	-0.0915***	-0.0713***	0.0579***
$IND_{it}*FY_{it}$	-0.0434*	-0.1837***	-0.0068	0.2003***	0.0480***	0.1222***	0.8183***	1	-0.0931***	0.1096***	-0.0906***	0.1079***	-0.0935***	0.1116***	0.0794***
INS_{it}	0.0551***	-0.0046	-0.0127	0.0204	-0.1423***	-0.1009***	-0.1213***	-0.0879***	1	0.5523***	0.2092***	0.117***	-0.0038	0.0086	0.0324*
$INS_{it}*FY_{it}$	-0.0489***	-0.5313***	0.1533***	0.4506***	-0.0841***	0.1072***	-0.0895***	0.0560***	0.6712***	1	0.1322***	0.6775***	-0.0022	0.5971***	0.0365**
$SIZE_{it}$	0.0243	-0.0201	0.0011	0.0268	-0.1050***	-0.0801***	-0.1004***	-0.0740***	0.2510***	0.1806***	1	0.5681***	0.0479***	0.0509***	0.3196***
$SIZE_{it}*FY_{it}$	-0.1274***	-0.8073***	0.2525***	0.6700***	-0.0239	0.2777***	-0.0508***	0.1834***	0.0697***	0.6590***	0.2702***	1	0.0246	0.6170***	0.1973***
LEV_{it}	-0.0346***	-0.0094	0.0048	-0.0039	-0.04158	-0.0338	-0.0915***	-0.0748***	-0.0198	-0.0132	0.0204	0.0035	1	0.5412***	-0.1550***
$LEV_{it}*FY_{it}$	-0.1302***	-0.6414***	0.2062***	0.5282***	-0.0210	0.2184***	0.0360***	0.1222***	-0.0015***	0.4721***	0.0324*	0.7351***	0.5514***	1	-0.0668***
$PREROE_{it}$	0.0482***	-0.0011	-0.0165	0.0277***	-0.1002***	-0.0841***	0.0579***	0.0437***	0.0297***	0.0320***	0.3250***	0.0979***	-0.1893***	-0.0885***	1

Notes: 1. Pearson (Spearman) correlation coefficients are below (above) the diagonal. ***, **, * indicate the statistical significance at 1%, 5% and 10% level respectively. (3,603 firm-year observations)

2. EMit which is a proxy variable that denotes manipulating earnings around the zero-earnings threshold, is a dummy variable that takes the value 1 for a firm-year observation with small annual positive earnings and 0 for a firm-year observation with small annual negative earnings; DD1it is a dummy variable that takes the value 1 when the company i is audited by the Big Four audit firms and the firm-year belongs to the fiscal group during t, and 0 otherwise; DD2it is a dummy variable that takes the value 1 when the company i is not audited by the Big Four audit firms and the firm-year belongs to the nonfiscal group during t, and 0 otherwise; DD3it is a dummy variable that takes the value 1 when the company i is audited by the Big Four and the firm-year belongs to the nonfiscal group during t, and 0 otherwise; DUALit is a dummy variable taking the value 1 if CEO is the President and 0 otherwise at the period t; INDit is the proportion of independent directors on the board at period t; INSit is the shareholdings of institutional shareholders at the period t; SIZEit is the natural logarithm of market value of equity at period t; LEVit is the ratio of total liability to total assets at the period t; FYit is a dummy variable taking the value 1 when company i does not belongs to the nonfiscal group at period t, 0 otherwise; PREROEit is the mean of return of equity (net income/average equity) over the past five years.

Table 3
The Empirical Results of the Relationship Between the Stakeholders and Earnings Manipulation Around the Zero-Earnings Threshold

$$EM_{it} = \delta_0 + \delta_1 DD1_{it} + \delta_2 DD2_{it} + \delta_3 DD3_{it} + \delta_4 DUAL_{it} + \delta_5 DUAL_{it} * FY_{it} + \delta_6 IND_{it}$$

$$+ \delta_7 IND_{it} * FY_{it} + \delta_8 INS_{it} + \delta_9 INS_{it} * FY_{it} + \delta_{10} SIZE_{it} + \delta_{11} SIZE_{it} * FY_{it}$$

$$+ \delta_{12} LEV_{it} + \delta_{13} LEV_{it} * FY_{it} + \delta_{14} PREROE_{it} + \tau_{it} \tag{4}$$

Variables	Coefficient Estimate	Std. Err.	*p*-value
Intercept	-0.1924	0.3233	0.5518
$DD1_{it}$	0.0631	0.0998	0.5273
$DD2_{it}$	0.5535	0.3706	0.1354
$DD3_{it}$	0.4278	0.3682	0.2454
$DUAL_{it}$	0.0093	0.0944	0.9213
$DUAL_{it} * FY_{it}$	-0.0819	0.1088	0.4516
IND_{it}	0.8122*	0.4748	0.0871
$IND_{it} * FY_{it}$	-1.0017*	0.5497	0.0684
INS_{it}	0.0040*	0.0024	0.0957
$INS_{it} * FY_{it}$	-0.0004	0.0027	0.8819
$SIZE_{it}$	0.0588	0.0402	0.1435
$SIZE_{it} * FY_{it}$	-0.0769*	0.0455	0.0910
LEV_{it}	0.1086	0.2635	0.6802
$LEV_{it} * FY_{it}$	-0.4250	0.3034	0.1613
$PREROE_{it}$	0.0062**	0.0026	0.0189

Notes: 1. ***, **, * indicate the statistical significance at 1%, 5% and 10% level respectively. It is two-tailed *p-value* and the Wald value of χ^2 is 102.9186. (3,603 firm-year observations)

2. EMit which is a proxy variable that denotes manipulating earnings around the zero-earnings threshold, is a dummy variable that takes the value 1 for a firm-year observation with small annual positive earnings and 0 for a firm-year observation with small annual negative earnings; DD1it is a dummy variable that takes the value 1 when the company i is audited by the Big Four audit firms and the firm-year belongs to the fiscal group during t, and 0 otherwise; DD2it is a dummy variable that takes the value 1 when the company i is not audited by the Big Four audit firms and the firm-year belongs to the nonfiscal group during t, and 0 otherwise; DD3it is a dummy variable that takes the value 1 when the company i is audited by the Big Four and the firm-year belongs to the nonfiscal group during t, and 0 otherwise; DUALit is a dummy variable taking the value 1 if CEO is the President and 0 otherwise at the period t; INDit is the proportion of independent directors on the board at period t; INSit is the shareholdings of institutional shareholders at the period t; SIZEit is the natural logarithm of market value of equity at period t; LEVit is the ratio of total liability to total assets at the period t; FYit is a dummy variable taking the value 1 when company i does not belongs to the nonfiscal group at period t, 0 otherwise; PREROEit is the mean of return of equity (net income/average equity) over the past five years.

duality, independent directors, institutional owners, and audit quality when firms are faced with small losses.

When chairpersons are the CEOs, conflict between the roles and the maximal power and influence of the chairpersons in their boardrooms (Hambrick, Werder and Zajac, 2008) may complicate behaviors involving manipulating earnings around the zero-earnings threshold. The effect of CEO–chairperson duality on earnings manipulations around the threshold, represented by δ_4 in Table 3, is positive but insignificant, showing that CEO–chairperson duality does not affect earnings manipulation around the threshold significantly in firms of the fiscal groups; thus, Hypothesis 1 is not supported. Studies on the relationship between corporate governance and earnings management maintain that CEO–chairperson duality weakens the monitoring power of corporate boards and reduces earnings management. However, according to the empirical results of the present study, such an argument does not explain behaviors involving earnings manipulation around the zero-earnings threshold.

The correlation between the percentage of independent directors and earnings manipulation around the threshold in the fiscal group, represented by δ_6 in Table 3, is significantly positive (.8122), thus supporting Hypothesis 2. However, this result is inconsistent with the findings of other studies on conventional corporate governance, in which higher ratios of independent director seats constrain earnings management more effectively. Thus, the empirical results of this study imply that manipulating small amounts around the zero-earnings threshold differs from general earnings management. Because the manipulation of such small amounts is difficult or impossible to detect, even expert independent directors may not uncover specific evidence to confirm earnings manipulation by company executives around the zero-earnings threshold. Therefore, no negative correlation is identified between the percentage of independent directors and earnings manipulation around the threshold. Moreover, the positive correlation shows that executives' decisions to avert losses may satisfy the interest of independent directors (thus averting press attacks and avoiding of being the director of a firm with net losses).

Compared with that of the fiscal group, the incremental effect of the

percentage of independent directors on earnings manipulation around the threshold in the nonfiscal group is significantly negative (δ_7 = -1.0017); no significant correlation exists between the percentage of independent directors and earnings manipulation around the threshold in the nonfiscal group ($\delta_6 + \delta_7$ does not deviate significantly from zero, *p-value*= .4960). In other words, no significant association between the percentage of independent directors and earnings manipulation around the threshold is identified in the nonfiscal group. Thus, nonfiscal annual earnings are not the targets of executives practicing earnings management.

The coefficient δ_8 in Table 3, which represents the correlation between the institutional ownership of shares and earnings manipulations around the zero-earnings threshold, is significantly positive (.0040), supporting Hypothesis 3. The empirical results indicate that a higher institutional ownership of shares increases the likelihood of earnings manipulation around the threshold by a firm in the fiscal group. Firms rely on institutional owners, who are shareholders and primary stakeholders, to acquire key resources such as capital. Institutional owners typically announce the firms' short-term profits forecasts, and company executives are pressured into attaining the forecasted numbers. If investors' stock trading behaviors are consistent with prospect theory predictions, then executives are likely to manage earnings to achieve the thresholds that they wish to attain (Degeorge, Patel and Zeckhauser, 1999). Therefore, the higher the institutional ownership is, the more strongly enterprise executives are motivated to avert losses. The argument by conventional studies on corporate governance, in which aggressive monitoring by institutional owners reduces agency problems and mitigates earnings management effectively, does not explain behaviors involving earnings manipulations around the zero-earnings threshold.

Finally, δ_1, which represents the correlation between audit quality and earnings manipulation around the threshold, is positive but insignificant (.0631), indicating that in the fiscal group, compared with that of the non-Big Four audit firms, the incremental effect of the Big Four on earnings manipulation around the threshold is not significant. The effect of the combination of fiscal group and Big Four audit firms on earnings manipulation around the threshold is not significant

($\delta_0 + \delta_1$ did not reach the level of significance, *p-value* = .6822), and Hypothesis 4 is not supported. Similarly, δ_2 and δ_3 are positive but insignificant, indicating that neither the incremental effect of the Big Four nor that of the non-Big Four on earnings manipulation around the threshold in the nonfiscal group is significant. These results are consistent with the argument by Dichev and Skinner (2002) and Jacob and Jorgensen (2007) that nonfiscal annual earnings are not the targets of earnings management.

Regarding the other control variables in Model (1), *PREROE$_{it}$* is significantly positive (.0062), indicating that firms with more favorable performance in past years are more inclined to manipulate earnings around the zero-earnings threshold. With the exception of *SIZE$_{it}$*FY$_{it}$*, which is significantly negative (-.0769), none of the control variables (i.e., *SIZE$_{it}$* or *LEV$_{it}$*) reach the level of significance. Therefore, these control variables are not discussed further.

In summary, the empirical results of this study indicate that conventional corporate governance approaches, which constrain general earnings management behaviors effectively, may not prevent manipulating earnings around the zero-earnings threshold. We adopt a perspective that emphasizes the relationship between stakeholders and firm decisions to analyze the associations between attempts to manipulate earnings around the zero-earnings threshold (firm decisions) and CEO–chairperson duality, independent directors, institutional owners, and accountants (stakeholder decisions). The empirical results show that the ratio of independent directors and the institutional ownership of shares are both significantly positively correlated with manipulating earnings around the zero-earnings threshold; however, audit quality (Big Four audit firms) and CEO–chairperson duality are not significantly associated with manipulating earnings around the threshold. Therefore, manipulating earnings around the zero-earnings threshold is confirmed to differ from conventional earnings management.

5. Additional Tests

5.1 Annual Earnings Histogram

Regarding the application of prospect theory, Hayn (1995) addresses

discontinuities around the zero-earnings threshold in annual earning histograms. Burgstahler and Dichev (1997) identify the discontinuities around zero in the 1976 and 1994 data of US firms, which confirms that they manipulated earnings around the zero-earnings threshold. [30] In examining these empirical results, Durtschi and Easton (2005) suspect that such discontinuities are false readings attributable to scaling. Jacob and Jorgensen (2007) expand on the study by Burgstahler and Dichev (1997) and formulate a different research design, which confirms the existence of discontinuities in the histograms and supports the conclusion of Burgstahler and Dichev (1997).

The research design of Jacob and Jorgensen (2007) involves using two approaches to measure annual earnings: fiscal annual earnings and nonfiscal annual earnings (i.e., total earnings from the second quarter to the first quarter of the following year, from the third quarter to the second quarter of the following year, or from the fourth quarter to the third quarter of the following year). A nonfiscal annual earnings histogram was created to predict the distribution of fiscal annual earnings (i.e., an earnings histogram without earnings management). The results show that loss manipulation occurred only in the fiscal annual earnings but not in the nonfiscal annual earnings. Jacob and Jorgensen (2007) maintain that nonfiscal annual earnings are less likely to be affected by earnings management. If fiscal year earnings are managed in the fourth quarter and if the earnings management effects reverse in subsequent quarters, then this alternate annual earnings figure might represent the economic earnings for a year more accurately than the fiscal year earnings reported in firms' annual financial statements.

Jacob and Jorgensen (2007) indicate that the greatest challenge of testing for earnings management lies in specifying comparison standards in the absence of manipulation (i.e., under the null hypothesis). Most studies that examine earnings management through accrual manipulation adopt the model employed by Jones (1991) to estimate discretionary accruals under the null hypothesis. However,

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[30] The research method of Burgstahler and Dichev (1997) is employed in further studies to investigate earnings manipulation around the threshold (Dichev and Skinner, 2002; Roychowdhury, 2006; Jacob and Jorgensen, 2007; Lin, 2001).

Kothari, Leone, and Wasley (2005) identify potential errors in the model specifications used by Jones (1991) to test firms demonstrating extreme performance. Similarly, specification problems are present in histograms of earnings without manipulation when they are used to test earnings management. Jacob and Jorgensen (2007) indicate that flaws may exist in the approach of Burgstahler and Dichev (1997), in which the average of the number of firms in the adjacent partitions of the first partition to the left of the zero-earnings threshold is taken as the expected frequency.[31] The potential flaws include the following: (a) if earnings manipulation around the threshold is identified, then the frequencies in partitions adjacent to the threshold may also be affected by the manipulation. (b) If earnings management is identified in more than one partition, then using the average number of neighboring firms on the two sides of the partition to obtain the expected distribution may not enable detecting earnings management. (c) If the potential partition of earnings management is also the peak of the earnings distribution, then the expected distribution that is calculated may not be applicable. Therefore, Jacob and Jorgensen (2007) incorporate three quarters of the nonfiscal annual earnings histogram as the expected fiscal earnings distribution (i.e., earnings histograms without earnings management) to conduct z tests of discontinuity around the zero-earnings threshold, as follows:

$$Diff_i = p_i^{(4)} - \frac{1}{3}[p_i^{(1)} + p_i^{(2)} + p_i^{(3)}] \tag{2}$$

$$VAR_i = N\{p_i^{(4)}(1 - p_i^{(4)}) + \frac{1}{9}[p_i^{(1)}(1 - p_i^{(1)}) + p_i^{(2)}(1 - p_i^{(2)}) + p_i^{(3)}(1 - p_i^{(3)})]\} \tag{3}$$

$$Z_i = \frac{N \cdot Diff_i}{(VAR_i)^{1/2}} \tag{4}$$

where $p_i^{(q)}$ represents the proportion of the samples of earnings in the annual period ending in Quarter q in Partition i ($q = 1, 2, 3, 4$); $Diff_i$ is a test statistic

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[31] In statistical testing to identify discontinuities around zero-earnings thresholds, Burgstahler and Dichev (1997) designate the first interval on the left of the threshold (Interval 0) as the interval of firms with small negative earnings closest to the threshold. If the actual frequency distribution of the firms in Interval 0 is significantly lower than that of the predicted frequency distribution (the average frequency distribution of the firms in Partitions -1 and 1), and the z test fulfills the level of significance (Burgstahler and Dichev, 1997, p. 103, Note 6), then the firms are confirmed to have managed earnings to avert losses.

and represents the difference between the actual distribution and the expected distribution; VAR_i represents the asymptotic variance of *Diff*; Z_i represents the asymptotic distribution (standard normal distribution); and N represents the number of observations.

The higher the absolute value of z is, the greater the difference between the actual distribution and the expected distribution. Therefore, a greater negative value in Partition 0 indicates that the sample ratio of fiscal group in the partition is significantly lower than the corresponding sample ratio of nonfiscal group (expected distribution); a greater positive value in Partition 1 indicates that the sample ratio of fiscal group in the partition is significantly higher than the corresponding sample ratio of nonfiscal group. Thus, a discontinuity is identified around the zero-earning threshold in the annual earnings histogram and confirms that firms have manipulated the threshold to avert losses.

Currently, no studies adopt the model of Jacob and Jorgensen (2007) to verify whether loss-aversion earnings management in Taiwanese listed firms can be attributed to scaling.[32] The additional test in this study uses the model of Jacob and Jorgensen (2007) to formulate a cross-sectional earnings histogram and to conduct a statistical test of earnings manipulation around the zero-earnings threshold. Durtschi and Easton (2005) maintain that analysts and financial media typically report earnings per share (EPS) rather than net incomes.[33] Therefore, the earnings histograms in this study are presented in terms of EPS.[34] With mean EPS as the center, two standard deviation values were designated on each side of the mean, with 150 partitions being divided among these four standard deviation

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[32] Studies that incorporate the earnings histogram of Burgstahler and Dichev (1997) reveal that earnings management is prevalent in Taiwanese firms. However, excluding the histogram of the electronics industry by Lin (2001), all other studies in Taiwan involving earnings histograms are Master's theses and are therefore not displayed in detail.

[33] Durtschi and Easton (2005) suggest that the discontinuity in earnings histograms may be caused by selection bias. Because no consensus among scholars has been reached regarding the EPS data from the I/B/E/S (Degeorge, Patel and Zeckhauser, 1999) and Compustat DBs (Burgstahler and Dichev, 1997), we adopt single-quarter and cumulative financial statements from the TEJ Finance DB to avoid this problem.

[34] In the sensitivity test, we also plotted earnings histograms by using net and ordinary incomes after subtracting equity market capitalizations. Discontinuity was identified around the zero-earnings threshold in each histogram, confirming the reports on EPS.

intervals.[35] The total number of samples in the chart is 42,151, including 10,457 fiscal and 31,604 nonfiscal observations.[36]

Figures 1-1 to 1-5 show the earnings histograms based on EPS. Discontinuity was identified around the zero-earnings threshold in the fiscal earnings histograms (Figure 1-4), but the patterns around the thresholds in the fiscal earnings histograms ending at the end of the first, second, and third quarters (Figures 1-1– 1-3) and the combined nonfiscal chart (Figure 1-5) are relatively smooth. Specifically, the annual earnings histograms of Taiwanese listed firms plotted according to the model of Jacob and Jorgensen (2007) are consistent with their empirical findings; the discontinuities around zero in the annual earnings histograms do not support the assertion of Durtschi and Easton (2005) that they may be attributable to scaling.

Table 4 lists the actual and the expected frequencies of fiscal annual earnings (EPS) for 20 partitions around the zero-earnings threshold. The expected frequencies are the average frequencies of the nonfiscal groups. The partitions below the zero-earnings threshold were labeled Partitions 0 to -10. Among the 11 frequencies in these partitions, 10 showed negative variance in the actual frequency from the expected frequency for fiscal annual earnings. The partitions above the zero-earnings threshold were labeled Partitions 1 to 9. Eight frequencies in these partitions showed positive variance in the actual frequency from the expected frequency. Moreover, the deviation from the expected frequency ratio is significantly negative in Partition 0 ($z = -5.77412$) and significantly positive in Partition 1 ($z = 6.18599$). The frequency of small negative earnings (Partition 0) is

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[35] The class interval of the EPS histograms obtained using the four annual earnings measurement approach is approximately .08 (.0848 for Figure 1-1, .0852 for Figure 1-2, .0860 for Figure 1-3, and .0859 for Figure 1-4). Figure 1-5 combines the histograms for nonfiscal annual earnings (i.e., the frequency totals of the corresponding pairs of samples on both sides of the zero-earnings threshold in Figure 1-1–1-3): annual earnings calculated at the end of the first (Figure 1-1), second (Figure 1-2), and third quarters (Figure 1-3). Therefore, no class intervals exist in Figure 1–5. In addition, the intervals among the four standard deviation values were divided into 100 or 200; the results are consistent with the empirical results of this study.

[36] There were a total of 31,604 data points for the nonfiscal group, including 10,517 data points on the total earnings from the second quarter to the first quarter of the following year, 10,529 data points on the total earnings from the third quarter to the second quarter of the following year, and 10,558 data points on the total earnings from the fourth quarter to the third quarter of the following year.
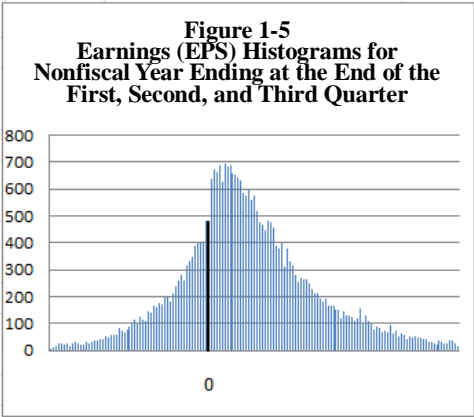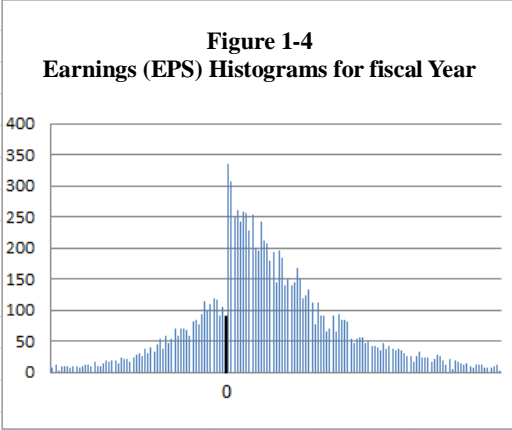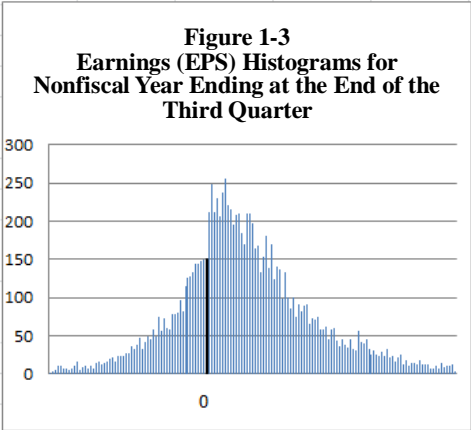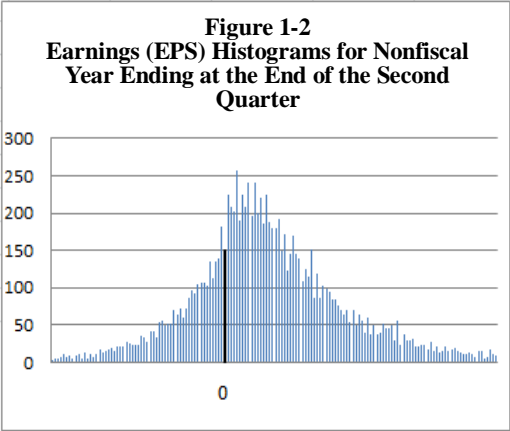
Figure 1

Figure 1-1
Earnings (EPS) Histograms for Nonfiscal Year Ending at the End of the First Quarter

Figure 1-2
Earnings (EPS) Histograms for Nonfiscal Year Ending at the End of the Second Quarter

Figure 1-3
Earnings (EPS) Histograms for Nonfiscal Year Ending at the End of the Third Quarter

Figure 1-4
Earnings (EPS) Histograms for fiscal Year

Figure 1-5
Earnings (EPS) Histograms for Nonfiscal Year Ending at the End of the First, Second, and Third Quarter
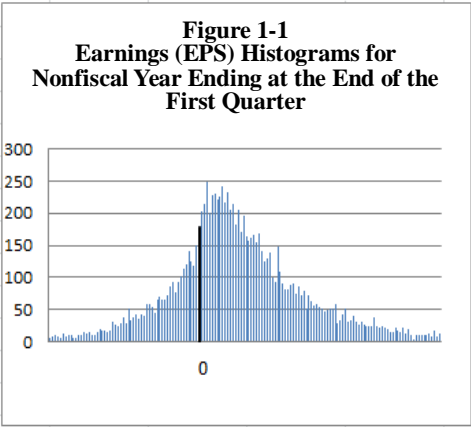
Table 4
Expected and Actual Frequencies of the Fiscal Group- Partitions -10 to 9
based on earnings per shares

Partition	Frequency for fiscal group (%)	Expected Frequency (%)	Difference	Z-statistic
-10(-0.9449,-0.8590)	0.7636364	0.8515152	-0.08788	-0.90412
-9(-0.8590,-0.7731)	0.7090909	0.7939394	-0.08485	-0.90516
-8(-0.7731,-0.6872)	0.8454545	0.9545455	-0.10909	-1.06534
-7(-0.6872,-0.6013)	1.0454545	1.0090909	0.03636	0.32614
-6(-0.6013,-0.5154)	0.8909091	1.0454545	-0.15455	-1.46282
-5(-0.5154,-0.4295)	0.9909091	1.1818182	-0.19091	-1.71043
-4(-0.4295,-0.3436)	1.0818182	1.2090909	-0.12727	-1.10163
-3(-0.3436,-0.2577)	1.0636364	1.2212121	-0.15758	-1.37039
-2(-0.2577,-0.1718)	0.8272727	1.2272727	-0.40000	-3.79126
-1(-0.1718,-0.0859)	0.9636364	1.4545455	-0.49091	-4.30242
0(-0.0859, 0)	0.8272727	1.4545455	-0.62727	-5.77412
1(0, 0.0859)	3.0545456	1.9363636	1.11818	6.18599
2(0.0859, 0.1718)	2.7818182	2.0363636	0.74545	4.25939
3(0.1718, 0.2577)	2.2636364	2.0060606	0.25758	1.59531
4(0.2577, 0.3436)	2.3636364	2.0818182	0.28182	1.71017
5(0.3436, 0.4295)	2.1909091	1.8939394	0.29697	1.87405
6(0.4295, 0.5154)	2.3454545	2.1030303	0.24242	1.47368
7(0.5154, 0.6013)	2.3272727	2.0757576	0.25152	1.53571
8(0.6013, 0.6872)	2.0636364	2.0818182	-0.01818	-0.11604
9(0.6872, 0.7731)	2.3000000	1.9848485	0.31515	1.94247

Note: The mean of the frequency in the same partition for the three nonfiscal annual periods was used as the expected frequency.

significantly lower than its corresponding expected frequency, whereas that in Partition 1 (small positive EPS) is significantly higher than its corresponding expected frequency. In other words, according to the discontinuity shown in the fiscal EPS histograms around the zero-earnings threshold, firms facing expected annual incomes lower than the threshold may attempt to cross the threshold through earnings management (Hayn, 1995; Burgstahler and Dichev, 1997; Jacob and Jorgensen, 2007).

If earnings management is more prevalent in the fiscal group than in the nonfiscal group (Das and Shroff, 2002; Gu, Lee and Rosett, 2002), then the histogram of fiscal annual earnings may be less smooth than that of the expected frequency distribution. Therefore, the average absolute value of the z statistics, calculated based on the differences between the actual frequency and the expected

frequency in each partition of the fiscal annual EPS histograms, would deviate significantly from zero. The average absolute value of the *z* statistics of each partition in Table 4 is 2.1135, indicating that the histogram of fiscal year earnings was less smooth compared to that of the expected frequency distribution.

5.2 Methods of Manipulating Earnings around the Zero-Earnings Threshold: Real Activity Manipulations or Accrual-Based Earnings Management

The additional test in this study was conducted to understand earnings management approaches (real activity manipulations or accrual-based earnings management) used by firms with small positive earnings to meet the zero-earnings threshold. If the firms that crossed the threshold through large-scale earnings management supplemented their earnings credibility deficiency with good corporate governance, then the empirical results of this study reflect such a phenomenon. Therefore, the real activity manipulations or accrual-based earnings management of firms with small positive earnings were investigated. If these firms met the zero-earnings threshold through large-scale earnings management, then the variables of real activity manipulations or accrual-based earnings management should be significantly larger than zero.

The approaches of Roychowdhury (2006) and Cohen, Dey and Lys (2008) are employed to measure the real earnings management indices (*RM*), which include abnormal operating cash flow (*AbCFO*) and abnormal discretionary expenditures (*AbDE*) and abnormal production costs (*AbPC*). Specifically, $RM = -AbCFO - AbDE + AbPC$. Higher *RM* indicates higher levels of real earnings management activities. The models (5), (6), and (7) were estimated industry by industry[37] and

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[37] The industries were classified according to Chang, Chou, and Lin (2001), and included the shipping industry. Industry type as per the Taiwan Stock Exchange (with the number of their Taiwan Stock Exchange code in parentheses) were generalized into eight major categories: food products (food products (02)), textiles (textiles (04)), electronics (semiconductors (24), computers and peripheral devices (25), photoelectricity (26), communication networks (27), electronic components (28), electronic circuits (29), information services (30), and other electronic industries (31)), electromechanics (electric machinery (05) and electric cables (06)), plastics and chemicals (plastics (03), rubber (11), and chemicals (21)), building materials and construction (concrete (01), steel (10), and building materials (14)), services and sales (tourism (16) and trading and consumers' goods (18)), and shipping (shipping (15)).

the residuals from the three models are defined as *AbCFO*, *AbDE*, and *AbPC*, respectively.

$$\frac{CFO_{it}}{TA_{it-1}} = \alpha_{1t} * \frac{1}{TA_{it-1}} + \alpha_{2t} * \frac{S_{it}}{TA_{it-1}} + \alpha_{3t} * \frac{\Delta S_{it}}{TA_{it-1}} + \omega_{it} \tag{5}$$

where CFO_{it} represents the operating cash flow of firm *i* in year *t*; S_{it} represents the net sales of firm *i* in *t*; ΔS_{it} represents the change in net sales of firm *i* in *t* ($S_{it} - S_{it-1}$); and TA_{it-1} represents the total assets of firm *i* at the end of year *t-1*.

$$\frac{DE_{it}}{TA_{it-1}} = \alpha_{1t} * \frac{1}{TA_{it-1}} + \alpha_{2t} * \frac{S_{it}}{TA_{it-1}} + \omega_{it} \tag{6}$$

where DE_{it} represents discretionary expenditures, defined as the sum of research and development expenses, advertising expenses, and sales, general, and administrative expenses. The other variables are the same as those in Model (5).

$$\frac{PC_{it}}{TA_{it-1}} = \alpha_{1t} * \frac{1}{TA_{it-1}} + \alpha_{2t} * \frac{S_{it}}{TA_{it-1}} + \alpha_{3t} * \frac{\Delta S_{it}}{TA_{it-1}} + \alpha_{4t} * \frac{\Delta S_{it-1}}{TA_{it-1}} + \omega_{it} \tag{7}$$

where PC_{it} represents the production costs of *i* in *t*, defined as the sum of cost of goods sold and changes in inventory. The other variables are the same as those in Model (5).

   Regarding the variables for measuring accrual-based earnings management, the modified Jones model developed by Kothari, Leone and Wasley (2005) is used to estimate discretionary accruals (*DAcc*). Cross-sectional industrial data are used to estimate Model (8), the residual of which represents the abnormal discretionary accruals (*AbDAcc*).

$$\frac{TACC_{it}}{TA_{it}} = \beta_0 + \beta_1 * \frac{1}{TA_{it-1}} + \beta_2 * \frac{\Delta S_{it}}{TA_{it-1}} + \beta_3 * \frac{PPE_{it}}{TA_{it-1}} + \beta_4 * ROA_{it} + \mu_{it} \tag{8}$$

where $TACC_{it}$ represents the total accruals, defined as the net income from continuing operations subtracted by the operating cash flows from operational activities; ΔS_{it} represents the change in net sales ($S_{it} - S_{it-1}$); PPE_{it} represents the gross amount of property, plant, and equipment; ROA_{it} represents the return on

total assets (net income divided by average total assets); TA_{it} represents total assets; and TA_{it-1} represents total assets.

Based on the aforementioned models, the average *RM* and *AbDAcc* of the fiscal firms with small positive earnings are -.0137 and .0071, respectively;[38] neither of the values deviates significantly from zero (*p-value* = .8920 and .3235). These results indicate the following: (a) no evidence of earnings manipulation around the zero-earnings threshold through real activity manipulations or accrual-based earnings management was identified. (b) If earnings around the threshold are manipulated through large-scale earnings management, then the variables of real activity manipulations or accrual-based earnings management should be significantly larger than zero; however, the means of the two variables obtained in the empirical results of this subsection do not deviate significantly from zero, indicating that earnings around the thresholds were not manipulated through large-scale earnings management. In summary, we maintain that manipulating earnings around the zero-earnings threshold differs from general earnings management. The amount involved in such manipulations may be small, and monitoring the manipulations is costly or impossible. Real activity manipulations entail actual enterprise transactions, with the discretionary accrual estimates falling within the acceptable range of GAAP. Consequently, specific evidence confirming small, manipulated amounts around the zero-earnings threshold may not be uncovered through an empirical model of real activity manipulations or accrual-based earnings management. The results of the additional test are consistent with such an argument.

5.3 Sensitivity Analysis

Article 14 of the Securities and Exchange Act, revised and effective in Taiwan on January 1, 2007, requires that firms satisfying certain qualifications must appoint independent directors of no less than two in number and no less than

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[38] In Model (1), the fiscal firms with small annual positive earnings but without corresponding variables of real activities manipulations or accrual-based earnings management were eliminated, reducing the number of samples to 773.

one-fifth of the total number of directors.[39] Three additional variables were added to Model (1) to examine the effect of this regulation regarding independent directors on the empirical results of this study: the dummy variable of the regulation (one if the sample is from 2007 or later, zero otherwise), the product of the dummy variable and the percentage of independent directors (IND_{it}), and the product of IND_{it} and the dummy variable of the regulation as well as the nonfiscal group dummy (FY_{it}). The empirical results for the sample before 2007 were consistent with Model (1) in this study. In other words, in the fiscal group, the percentage of independent directors is significantly positively correlated with manipulating earnings around the zero-earnings threshold (coefficient= 3.1448), supporting Hypothesis 2. Conversely, in the nonfiscal group, the percentage of independent directors causes a significant negative incremental effect on manipulating earnings around the zero-earnings threshold (coefficient= -2.3487); however, the ratio is not significantly correlated with the manipulation. After 2007, i.e., when the independent director regulation became effective, the positive correlation between the percentage of independent directors and earnings manipulations around the zero-earnings threshold decreased significantly (incremental coefficient= -2.8775) in the fiscal group. Thus, the regulation on independent director seats affected the correlation between the percentage of independent directors and earnings manipulations around the zero-earnings threshold.
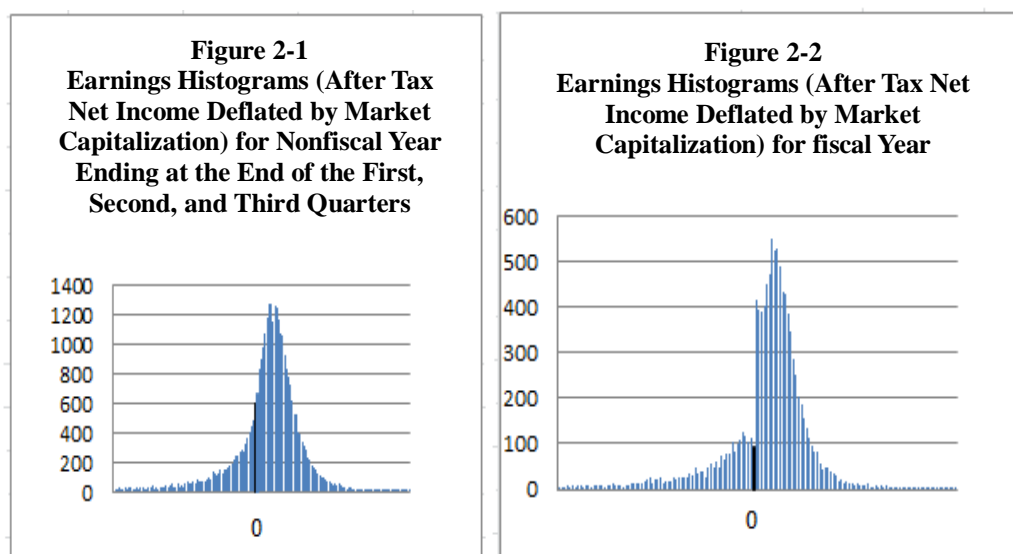
Measurement changes of some of the variables in Model (1) were tested to determine their effect on the empirical results. When the natural logarithm of the number of independent directors plus one was used to conduct a sensitivity analysis, $\delta_6 = .1587$, thus the result is still significant. The predicted signs and levels of significance of the other variables remained unchanged. Thus, the results of the sensitivity test are consistent with the empirical conclusion of this study. In

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[39] The Securities and Exchange Act authorizes the competent authority to require financial institutions (holding companies, banks, and ticketing, insurance, securities investment trust, integrated securities, and listed futures companies), which offer stocks publicly in accordance with the law, and nonfinancial listed companies with paid-up capitals of up to NT$10 billion to appoint independent directors of no less than two in number and no less than one-fifth of the total number of directors, in accordance with the articles.

addition, if the institutional ownership of shares is replaced with the foreign shareholding ratio, then the coefficient corresponding to the foreign shareholding ratio is .0078, which yields a slightly higher value than that of the institutional ownership of shares but a slightly lower significance (p= .1000). The predicted signs and levels of significance of the other variables remained unchanged.
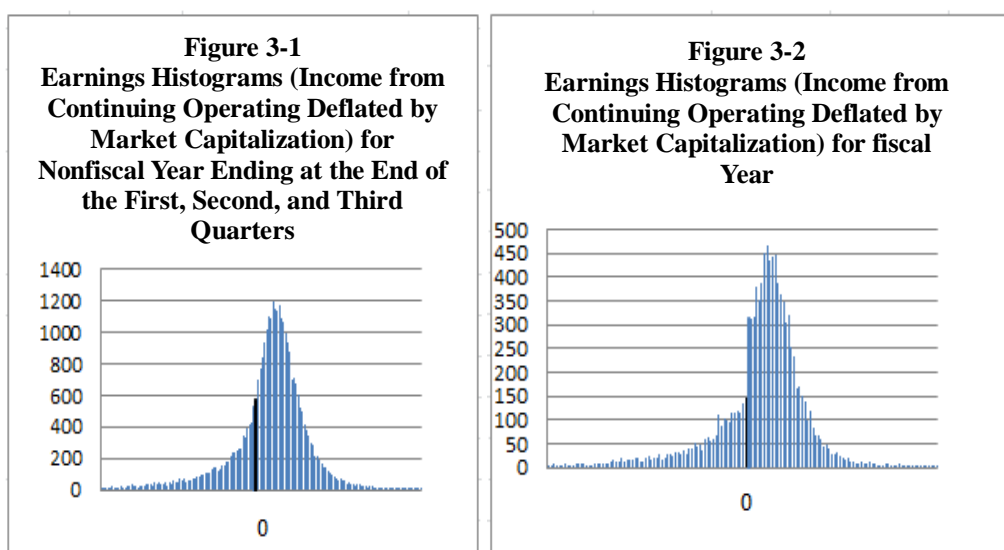
Finally, in the additional test of the annual earnings histogram, after tax net incomes (Figure 2-1 and 2-2) and incomes from continuing operation (Figure 3-1 and 3-2) deflated by market capitalization were used to plot the earnings histogram. Because of the space limitations of this paper, only histograms combining the fiscal and nonfiscal annual earnings are displayed. Discontinuity still occurs around the zero-earnings threshold in the histograms, consistent with the results based on EPS.[40]

Figure 2

Figure 2-1
Earnings Histograms (After Tax Net Income Deflated by Market Capitalization) for Nonfiscal Year Ending at the End of the First, Second, and Third Quarters

Figure 2-2
Earnings Histograms (After Tax Net Income Deflated by Market Capitalization) for fiscal Year

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[40] The earnings histogram plotted according to net income after subtracting total assets (not displayed in this paper) also corresponds with the conclusion of this paper.

Figure 3

Figure 3-1
Earnings Histograms (Income from Continuing Operating Deflated by Market Capitalization) for Nonfiscal Year Ending at the End of the First, Second, and Third Quarters

Figure 3-2
Earnings Histograms (Income from Continuing Operating Deflated by Market Capitalization) for fiscal Year

6. Conclusion

The manipulation of small amounts around the zero-earnings threshold differs from conventional earnings management. According to prospect theory and cost-benefit considerations of transactions, real activity manipulations entail actual enterprise transactions, and manipulations of small amounts around the zero-earnings threshold, which involve discretionary accrual estimates that fall within the acceptable range of GAAP, are difficult or impossible to detect. Therefore, in addition to a perspective that emphasizes conventional corporate governance and audit quality effectively inhibiting earnings management, we examined behaviors involving manipulating earnings around the zero-earnings threshold from a perspective that emphasizes the relationship between stakeholders and firm decisions, thereby providing a broader and more dynamic analysis of corporate governance.

The empirical results of this study indicate that the perspective that focuses on the relationship between stakeholders and firm decisions explains behaviors involving earnings manipulations around zero-earnings threshold more effectively than does the perspective that focuses on conventional corporate governance and

audit quality. The results are listed as follows: (a) Independent directors and the institutional ownership of shares are significantly positively correlated with manipulating earnings around the zero-earnings threshold. However, audit quality (measured by Big Four audit firms) and CEO–chairperson duality are not significantly correlated with such manipulations. The empirical results differ from the perspective that emphasizes conventional corporate governance and supports the perspective that emphasizes the relationship between stakeholder and firm decisions. (b) The results of the additional test, conducted using the research design of Jacob and Jorgensen (2007), indicate that discontinuities around the zero-earnings threshold in the fiscal annual earnings histogram of the Taiwanese listed firms are not caused by scaling. These results confirmed that the firms manipulated their earnings into small gains when facing small losses, thereby improving on the flaws of studies that adopted the model of Burgstahler and Dichev (1997). In addition, the means of the real activity manipulations and abnormal discretionary accruals by the firms that crossed the zero-earnings thresholds did not deviate significantly from zero, which is consistent with our argument that manipulating earnings around the zero-earnings threshold involves manipulating small earnings amounts.

In summary, this study shows that manipulating earnings around the zero-earnings threshold, a subtopic of earnings management, differs from other forms of earnings management and confirms that the threshold is the reference point of the valuation function for stakeholders (e.g., executives, corporate boards, investors, and accountants). Therefore, understanding firm behaviors enables the users of financial statements to interpret corporate income information and studies on accounting to accumulate multifaceted empirical evidence.

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