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Audit adjustments and the discontinuity in earnings distribution around zero

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Abstract

Purpose – Previous research in auditing has used the probability of small profits or losses as a measure of audit quality. The purpose of this paper is to investigate the validity of the underlying assumption in prior audit literature that auditing mitigates clients' inclination towards loss avoidance and to shed light on the debate regarding earnings discontinuity.

Design/methodology/approach – This paper compares the discontinuity in earnings distribution around zero, both before and after auditing.

Findings – Using a unique data set that contains both recorded and waived adjustments, the authors find that audit adjustments do not reduce the discontinuity in earnings distribution around zero.

Research limitations/implications – The results advise caution in using the probability of small profits or losses as a measure of audit quality. The findings suggest the discontinuity in earnings around zero may not be caused by loss avoidance achieved through accounting misreporting, which falls under the purview of auditing.

Originality/value – This research makes unique contributions beyond those of prior studies. By incorporating waived adjustments, the authors are able to conduct more comprehensive tests and explore richer details of audit adjustments that were not available in previous studies. The proportion of losses in this study's sample aligns with that in prior US research, which enhances the generalisability of the authors' findings and minimizes the influence of inherent discrepancies in auditors' motivations to curb loss avoidance.

Keywords Audit quality, Earnings management, Audit adjustments, Discontinuity in earnings distribution

Paper type Research paper

1. Introduction

Accounting researchers have documented that a discontinuity exists in the earnings distribution around zero (Hayn, 1995; Burgstahler and Dichev, 1997; Degeorge *et al.*, 1999). However, there is considerable debate among researchers about whether the earnings discontinuity around zero is evidence of earnings management (Burgstahler and Dichev, 1997; Degeorge *et al.*, 1999; Dechow *et al.*, 2003; Durtschi and Easton, 2005, 2009; Beaver *et al.*, 2007; Gilliam *et al.*, 2015; Burgstahler and Chuk, 2015). Despite the ongoing debate about the association between earnings management and earnings discontinuity, many auditing studies use the discontinuity in earnings around zero (the likelihood of meeting or beating the zero earnings benchmark) as a proxy for audit quality (Carey and Simnett, 2006; Caramanis and Lennox, 2008; Francis *et al.*, 2013; Chen *et al.*, 2001; Rosati *et al.*, 2022; Guo *et al.*, 2022). The

underlying assumption in these audit studies is that high-quality audit reduces clients' tendency to meet or beat the zero earnings benchmark. Using a data set that contains both pre-audit and audited earnings from China, Lennox *et al.* (2016) find that audit adjustments do not reduce the discontinuity in the distribution of earnings around zero. However, the authors caution that the generalisability of their findings outside of China may be limited, as the unique listing regulation in China could significantly reduce auditors' incentive to restrict loss avoidance compared to auditors in other countries. In their conclusion, Lennox *et al.* (2016) call for further research to assess the generalisability of their findings.

In this study, we aim to investigate the validity of the underlying assumption in previous audit studies that auditing mitigates the tendency of loss avoidance and whether the earnings discontinuity around zero is a reliable proxy for audit quality. Specifically, we examine whether auditing adjustments reduce the earnings discontinuity around zero using a unique data set of audit adjustments from Singapore with 1,236 company year observations. If the discontinuity in earnings around zero is caused by accounting misreporting, which falls under the purview of auditing, and if auditing mitigates this discontinuity, then we would expect lower frequencies of small profits and higher frequencies of small losses in audited earnings compared to pre-audit earnings. In contrast, we find that the incidence of either small profits or small losses does not significantly differ between pre-audit earnings and audited earnings.

Audited earnings only reflect the adjustments that were recorded [1] and do not correct all the misstatements detected during the audit engagement. We also examine the distribution of *as-if* audited earnings (which assumes that all proposed adjustments were recorded) because this measure is not influenced by any auditor–client negotiations to waive the proposed adjustments. Prior studies find that more than 20% of the proposed audit adjustments were subsequently waived (Joe *et al.*, 2011) and that auditors are more likely to waive smaller adjustments that aggregate to a material amount compared to those adjustments that are individually material (Braun, 2001). If companies avoid reporting small losses through numerous minor accounting misstatements (none of which are quantitatively or qualitatively material), researchers may observe no difference in the frequency of small losses and profits between pre-audit and audited earnings. By comparing pre-audit earnings with *as-if* audited earnings, we can more comprehensively evaluate whether auditors are trying to address clients' attempts to avoid losses during the auditing process. We find that, consistent with our results derived solely from recorded adjustments, the earnings discontinuity around zero remains unaffected even when we take into account all proposed adjustments.

We also conduct additional analyses for the sub-samples of companies with pre-audit small profits and small losses. We find that there is no evidence that auditors focus on companies with small pre-audit profits and restrict income-increasing earnings management from these companies. In particular, we observe that downward adjustments recorded for companies with pre-audit small profits are not as common or significant as those recorded for companies with pre-audit small losses. These supplementary analyses align with our main finding that auditing does not lessen the earnings discontinuity around zero.

We contribute to the research on auditing quality. Our results challenge the validity of the underlying assumption in previous audit studies that auditing mitigates the earnings discontinuity around zero, suggesting that using the probability of small profits vs. losses as a proxy for audit quality should be approached with caution. Our study offers distinct contributions in various aspects relative to prior research, including the works of Lennox *et al.* (2016) and Choudhary *et al.* (2022). Firstly, by analysing both recorded and waived audit adjustments, we conduct a more comprehensive assessment of whether auditing mitigates loss

avoidance. Secondly, we delve into deeper details of audit adjustments not available in prior research, including the amounts and underlying accounting issues of all adjustment entries. Thirdly, the proportion of losses in our sample aligns with previous US studies, thereby increasing the generalisability of our results and minimizing the effect of innate differences in auditors' incentives to constrain loss avoidance. Fourthly, we examine the distribution of after-tax earnings (instead of pre-tax earnings), consistent with prior accounting research. Lastly, our exploration of the Singapore context offers valuable insights into the International Financial Reporting Standards (IFRS) reporting regime in developed markets. We discuss these differences in more detail in Section 2.2.

Although the primary objective of our study is not to directly investigate whether earnings management causes earnings discontinuity, it contributes additional evidence to the ongoing debate about whether earnings discontinuity indicates earnings management. On the one hand, auditors bear the responsibility to limit clients' loss avoidance through opportunistic accounting estimations and choices, a practice known as accounting earnings management (Cohen *et al.*, 2008; Habib *et al.*, 2022). Yet, on the other hand, auditors are unable to prevent clients from engaging in loss avoidance through real business activities, such as reducing research and development expenditures, a practice recognised as real earnings management (Choi *et al.*, 2018; Habib *et al.*, 2022). Our study can aid in determining whether earnings discontinuity can be attributed to accounting misreporting within the purview of auditing. As auditors are charged with preventing clients from reporting small profits through opportunistic accounting misreporting, findings from this paper suggest that the earnings discontinuity around zero may not necessarily result from loss avoidance achieved through accounting misreporting under audit scrutiny. Instead, it could be the result of real earnings management or accounting choices allowed by auditors, or factors unrelated to earnings management, such as income taxes (Beaver *et al.*, 2007), and research design issues (Durtschi and Easton, 2005, 2009; Gilliam *et al.*, 2015).

Section 2 discusses the relevant literature and develops the hypotheses. Section 3 discusses the sample and presents descriptive statistics. Section 4 reports the main results and additional analyses. Section 5 concludes the paper.

2. Literature review and hypotheses development

2.1 Hypotheses development

A substantial body of research has documented the existence of a discontinuity in earnings distribution around zero. Hayn (1995) and Burgstahler and Dichev (1997) both find higher-than-expected frequencies of small positive earnings (just above zero) and lower-than-expected frequencies of small losses (just below zero). Degeorge *et al.* (1999) examine earnings distribution around three types of earnings thresholds (zero earnings, no earnings change, and analyst earnings forecasts) and confirm that the discontinuity in earnings distribution around zero is most prominent among the three thresholds. The discontinuity in earnings distribution around zero has been widely used as a proxy for audit quality in studies conducted in various countries (Carey and Simnett, 2006; Caramanis and Lennox, 2008; Francis *et al.*, 2013; Chen *et al.*, 2001; Rosati *et al.*, 2022; Guo *et al.*, 2022). The underlying assumption of these studies is that high-quality auditing reduces the tendency of clients just meeting or beating the zero earnings benchmark.

Despite these findings, the literature reveals considerable disagreement among researchers about the association between earnings discontinuity around zero and earnings management. On the one hand, Hayn (1995), Burgstahler and Dichev (1997), and Degeorge *et al.* (1999) all attribute the earnings discontinuity around zero to the tendency of managers to engage in earnings management to avoid reporting losses. Hayn (1995) concludes that the results suggest

that companies whose earnings are expected to fall just below the zero earnings point engage in earnings manipulations to help them cross the "red line" for the year. Burgstahler and Dichev (1997) estimate that 30%–44% of the companies with slightly negative pre-managed earnings use discretion to report positive earnings results. Furthermore, they find that two components of earnings, cash flow from operations and changes in working capital, have been used to manage earnings to avoid reporting losses. Degeorge *et al.* (1999) find that the future performance of companies just meeting zero earnings benchmark is worse than the control groups and conclude that discontinuity in the earnings distribution indicates earnings management around the threshold of zero earnings.

Conversely, several studies argue against the notion that earnings management causes the earnings discontinuity around zero. Dechow *et al.* (2003) find no evidence that companies meet or beat the zero earnings benchmark by managing earnings through boosting discretionary accruals. Instead, they find that firms with small profit and small loss have similar levels of discretionary accruals. They caution against using the ratio of small profit to small loss firms as a measure of earnings management. Beaver *et al.* (2007) hypothesize that income taxes draw profit observations towards zero, whereas negative special items drive loss observations away from zero. They show that the asymmetric effects of income taxes and special items for profit and loss firms contribute to a discontinuity around zero in the earnings distribution, even in the absence of earnings management. In addition, a debate exists regarding whether the earnings discontinuity around zero results from research design issues. Some researchers argue that this is due to issues related to scaling by price and sample selection (Durtschi and Easton, 2005, 2009; Gilliam *et al.*, 2015) [2]. However, this conclusion is disputed by Burgstahler and Chuk (2015).

Our paper is also connected to an expanding body of literature that examines audit adjustments data in various contexts. Lennox *et al.* (2018) analyse the influence of earnings management and audit adjustments on the financing of corporate acquisitions in China. They show that firms using more earnings management tend to finance their acquisitions with debt rather than equity. Conversely, firms with higher audit adjustments are less likely to use debt financing, indicating that quality audit processes and audit adjustments can help mitigate the adverse impact of earnings management on financing choices. Using a sample of public companies in China, Lennox *et al.* (2020) find that higher levels of audit partner ownership in audit firms are linked to lower levels of audit adjustments, suggesting higher audit quality. The authors attribute their findings to the alignment of interests between auditors and clients because of partner ownership and highlight the role of audit partner ownership in enhancing audit quality and financial reporting accuracy. Lennox and Wu (2022a, 2022b) examine the effects of mandatory internal control audits on financial reporting quality and audit adjustments in China and find that internal control audits decrease audit adjustments. These findings suggest that mandatory internal control audits can be an effective approach for improving financial reporting quality. These three studies emphasize the significance of audit adjustments in curbing earnings management and enhancing the accuracy of financial reporting, thereby supporting the utilisaton of audit adjustments in our study. In addition, Choudhary *et al.* (2022) investigate the determinants and consequences of waiving audit adjustments based on a sample of US public firms. They find that auditors frequently waive proposed adjustments, and the likelihood of waiver is related to client size and auditor tenure. Simulation results further suggest that waiving adjustments may lead to lower financial reporting accuracy and a reduced perception of audit quality. Choudhary *et al.* (2022) highlight the necessity of incorporating both recorded and waived audit adjustments in the evaluation of auditors' intentions.

We analyse whether audit adjustments mitigate the earnings discontinuity around zero. Our aim is to better understand if the incidence of small profits and losses serves as a valid indicator of auditing quality and whether the occurrence of small profits and losses is caused by accounting earnings management. If opportunistic accounting earnings management is the cause of the discontinuity in earnings distribution around zero and if the auditor is required to control this type of earnings management [3], we would expect to see low frequencies of small profits and higher frequencies of small losses in audited earnings compared to pre-audit earnings. However, if accounting earnings management does not cause the earnings discontinuity around zero, there should be no significant difference in the incidence of small profits and losses between pre-audit earnings and audited earnings. Lennox *et al.* (2016) study earnings discontinuity in a reporting environment where auditors might have different incentives to limit clients' loss avoidance compared to auditors in other countries. This is because client companies will face severe restrictions and adverse consequences if they report consecutive losses in China due to a unique listing regulation named "special treatment" (ST). Lennox *et al.* (2016) find that recorded audit adjustments do not reduce earnings discontinuities around zero for companies in China. In addition, Dechow *et al.* (2003) find no evidence that discretionary accruals cause earnings discontinuity at zero among US companies. Drawing on these previous studies, we hypothesize that audit adjustments will not reduce earnings discontinuity in our setting. We state the hypothesis in the null form as follows:

H1. The frequency of small profits (small losses) is the same in both pre-audit earnings and audited earnings.

Audited earnings only take into account recorded adjustments and do not correct all detected misstatements during the audit. The waiver of audit adjustments is a critical issue for auditing and financial reporting (Choudhary *et al.*, 2022). Yet, accounting research in this area is limited due to the unobservability of waived audit adjustments for most researchers. Waived audit adjustments result in no change to financial statements and do not lead to a modified audit opinion. Anecdotal evidence derived from our conversations with partners from auditing firms suggests that such waivers are due to the adjustments being less than materiality thresholds. The International Standard on Auditing 320 requires auditors to consider materiality on the overall financial statement level and classes of transactions, account balances, and disclosures. Auditors must assess whether misstatements of small amounts could cumulatively have a material effect on financial statements (IFAC, 2004). Waived audit adjustments, which result from auditor–client negotiation agreements, represent areas of concern for regulators (Choudhary *et al.*, 2022). Prior research has established that auditors and their clients usually must negotiate the proposed adjustments that affect the financial statements (Antle and Nalebuff, 1991; Gibbins *et al.*, 2001). Several studies examine the resolution of proposed audit adjustments and find many of the proposed audit adjustments are not recorded. For example, Icerman and Hillison (1991) and Wright and Wright (1997) find 49% and 65% of proposed adjustments were subsequently waived, and Joe *et al.* (2011) report this proportion to be 24.2% for a more recent sample after the passage of the Sarbanes-Oxley Act. Therefore, the ability of auditors to curb loss avoidance and opportunistic accounting earnings management depends on their ability to detect misreporting during the audit engagement and how auditors and clients resolve questionable accounting matters that were detected. Braun (2001) finds that auditors are more likely to waive smaller adjustments that aggregate to a material amount than those that are individually material. This finding is consistent with the result in Wright and Wright (1997) that auditors are less likely to waive large income-decreasing adjustments. If companies anticipate the audit process and avoid reporting small losses through accounting

earnings management, they may choose to engage in the types of misstatements that auditors are more likely to waive. This could happen even if the misstatements were detected during the audit engagement. If companies successfully manage their earnings upward to avoid reporting small losses by engaging in many small misstatements, each of which is neither qualitatively nor quantitatively material, researchers may observe no difference in the occurrence of small gains and losses between pre-audit and audited earnings. This may occur even if auditors attempt to mitigate clients' loss avoidance during the audit process. We construct *as-if* audited earnings under the hypothetical scenario in which all proposed audit adjustment entries would be recorded [4]. Conceptually, *as-if* audited earnings correct all misstatements detected during the audit engagement and are not affected by the auditor–client negotiation of the proposed adjustments. A comparison of pre-audit earnings with *as-if* audited earnings facilitates a thorough assessment of whether auditors tackle clients' loss avoidance in the audit process. If accounting earnings management causes the discontinuity in earnings distribution around zero and auditors comply with client demands and waive some audit adjustments that would have reduced earnings discontinuity, a smaller discontinuity would be expected in *as-if* audited earnings distribution compared to the pre-audit earnings distribution. Alternatively, if the discontinuity in earnings around zero is not attributed to accounting earnings management, the discontinuity observed in *as-if* audited earnings should not differ from that of pre-audit earnings. We state the hypothesis in the null form:

H2. The frequency of small profits (small losses) is the same in pre-audit earnings and as-if audited earnings.

2.2 Differences from prior studies

Our study provides unique contributions compared to previous research, such as Lennox *et al.* (2016) and Choudhary *et al.* (2022), in several aspects. Firstly, we are able to examine all adjustments proposed by auditors. Lennox *et al.* (2016) test whether the earnings discontinuity at zero is reduced by recorded adjustments. However, recorded adjustments do not reflect all the accounting misreporting that auditors intend to correct, as they are influenced by the negotiation between the auditor and client regarding the proposed adjustments. Choudhary *et al.* (2022) pointed out that waiver of audit adjustments is an important area in the financial reporting process that is poorly studied in archival accounting research, largely because this area is largely inaccessible to accounting researchers. Using both recorded and waived adjustments, we are able to assess more comprehensively whether audit adjustments alleviate discontinuity of the earnings distribution around zero.

Secondly, our paper explores richer details of audit adjustments not available in prior studies. Choudhary *et al.* (2022) examine the frequency of recorded vs. waived audit adjustments and the impact of waived adjustments on reporting quality using a large sample of PCAOB-inspected audits of US companies. However, their audit adjustments data set has the following limitations: the signs of the audit adjustments cannot be interpreted; reclassifications within a category are not included; and known and likely misstatements (e.g., judgemental errors or sampling projections) are not distinguished. In contrast, we study the impact of recorded and waived audit adjustments on earnings discontinuity. Our data set contains individual line-by-line audit adjustment entries containing fields such as accounts adjusted, debit vs. credit, amounts, and underlying accounting issues (e.g., over/under accrual, impairment). The recorded and waived adjustments in our data are signed, which allows us to report statistics separately for adjustments that adjust earnings downward, upward or neither. Our data set also contains reclassifications between accounts within a category and judgemental errors.

Thirdly, unlike in Lennox *et al.* (2016), the loss frequency in our sample is comparable to prior US studies, hence our results are less affected by the innate differences in auditors' incentives to curb loss avoidance and are more generalisable. In our sample, losses appear in 35.8% of audited earnings (34.4% of pre-audit earnings), which is consistent with 29.61% reported by Burgstahler and Dichev (1997) [5] and 30% reported by Hayn (1995) for the most recent period of her sample [6]. Compared to the USA and Singapore, the incidence of losses in the sample of Lennox *et al.* (2016) is significantly lower, with losses appearing in 9.6% of audited earnings (9.3% of pre-audit earnings) among Chinese firms with audit adjustment data. Jiang and Wang (2008) find that Chinese firms are only 50% as likely as US firms to report losses due to a special provision called the ST policy. Chinese security regulation mandates that listed firms with consecutive accounting losses for more than two years will be placed under the "ST" status. This "ST" status brings about various restrictions and potentially leads to delisting. Lennox *et al.* (2016) acknowledged that these serious negative consequences from losses might mean that Chinese auditors prefer to avoid audit adjustments that change the sign of the earnings from positive to negative. As the incentive to avoid losses (including small losses) due to regulatory pressure is much stronger among firms listed in China than in other places (Li *et al.*, 2014), it is possible that the findings of Lennox *et al.* (2016) cannot be applied beyond China.

Fourthly, our paper examines the distribution of *after-tax* earnings, a focus more consistent with prior studies, in contrast to Lennox *et al.* (2016), which focus on the distribution of *pre-tax* earnings due to data limitations [7]. Prior audit studies that use the likelihood of meeting or beating a zero earnings benchmark as a proxy for audit quality have focused on net profit (after-tax) rather than pre-tax earnings (Caramanis and Lennox, 2008; Francis *et al.*, 2013; Rosati *et al.*, 2022; Guo *et al.*, 2022) [8]. Meanwhile, Beaver *et al.* (2007) find that the earnings discontinuity around zero is less pronounced in the pre-tax earnings distribution than in the after-tax earnings distribution. Given that the audit process involves adjustments related to tax expenses and that such audit adjustments may impact the distribution of after-tax earnings, our study's utilisation of after-tax earnings provides a more comprehensive and direct test of whether auditing reduces earnings discontinuity near zero. This approach contrasts with tests involving pre-tax earnings as used in Lennox *et al.* (2016).

Lastly, our paper with the Singapore setting is useful as a basis for understanding IFRS reporting regime in developed markets, such as New Zealand, Australia, the UK, and European countries, which share comparable institutional environments. Generally Accepted Accounting Principles in Singapore are identical to IFRS [9], whereas Chinese Accounting Standards differ from IFRS in applying less fair value accounting [10]. Furthermore, prior research shows that China generally lacks the institutional environment for high-quality accounting information (Piotroski and Wong, 2012). Lennox and Wu (2022a, 2022b) point out that the accounting information environment for Chinese firms is shaped by the unique institutional setting in China, including factors such as political economy and guanxi (relationships). Ke *et al.* (2015) find that Big 4 audit firms assign less experienced audit partners to companies exclusively listed in China than those cross-listed in Hong Kong, which indicates potential differences in the institutional environment and audit quality requirements between China and other markets.

3. Research setting and sample

3.1 Regulation in Singapore and audit adjustments data

In Singapore, the Accounting Standards Council (ASC) is empowered by law under the Accounting Standards Act to prescribe accounting standards. ASC states that its broad policy intention is to adopt the IFRS issued by International Accounting Standards Board. Convergence with international accounting standards would achieve greater transparency

and comparability of financial information among companies and help lower compliance costs for companies investing in Singapore as well as local companies going overseas.

The Accounting and Corporate Regulatory Authority (ACRA) is the national regulator of business entities, public accountants, and corporate service providers in Singapore. ACRA's role is to monitor corporate compliance with disclosure requirements and regulation of public accountants performing statutory audits. In Singapore, audit firms need not provide audit adjustment data to ACRA. The audit adjustment data set used in this study was specifically collated from the audit firms for an industry project commissioned by ACRA. ACRA and the researchers reached out to Big 4 and mid-tiered audit firms in Singapore. A total of 12 audit firms (all the Big 4 and a majority of mid-tiered) agreed to take part in the study because the invitation to participate in the research study came from the regulator. The audit firms provided audit adjustment data on a non-attributable and confidential basis. The researchers signed confidentiality agreements with the audit firms not to release audit adjustment data at the client level and not to link the audit adjustments to other filings of the client companies. Because of the agreements, we are unable to include additional variables capturing the company or auditor–client relationship characteristics such as discretionary accruals, cash flows from operations, and audit tenure beyond the variables already available in the data set that we obtained. Our study does not investigate discretionary accruals and accrual earnings management in Singapore due to this data limitation. However, the existence of earnings manipulation among companies in Singapore has been established in prior research (Hu, 2010; Charoenwong and Jiraporn, 2009; Bradbury *et al.*, 2006). Charoenwong and Jiraporn (2009) find earnings management existed in Singapore and Thailand to avoid reporting losses and negative earnings growth.

3.2 Sample

The audit adjustments data set from Singapore covers 1,236 audit engagements of 412 public companies from 2018 to 2020 [11]. It comprises a total of 22,051 adjustment entries (both recorded and waived adjustments) with 55,415 entry lines. The data, which come from 12 audit firms, were directly keyed into a comprehensive Excel template. The Excel template was designed with inputs from partners and senior audit managers in our focus group discussions, to incorporate any audit-firm specific terminology and/or features of their individual working papers, and to facilitate ease of data entry by the audit firms.

Our data set contains line-by-line audit adjustments with both recorded and waived audit adjustments. Firstly, we summarize recorded audit adjustments by company year into those with downward adjustments on net income, those with upward adjustments on net income, and those that do not impact net income (e.g., adjustments only to balance sheet accounts or reclassifications between income statement accounts). These are based on the net effects of audit adjustments on income (increases or decreases in expenses or revenues) for each company year. We group the company year observations into various categories of small profits and small losses (based on thresholds used in prior studies). Audited earnings are computed based on pre-audit earnings and adding/subtracting recorded audit adjustments that increase/decrease net income. *As-if* audited earnings are computed by taking pre-audit earnings and adding or subtracting all proposed audit adjustments (both recorded and waived) that increase or decrease net income. Subsequently, we examine the occurrence of small profits and small losses in pre-audit earnings, audited earnings and *as-if* audited earnings.

Panel A of Table 1 displays the composition of our sample, which comprises 412 companies each year between 2018 and 2020. Our sample does not include audit

adjustments for all public companies in Singapore. Twelve audit firms voluntarily provided the audit adjustment data, and the public companies need to be their audit clients consecutively for three years (2018–2020). However, we note that the companies are well distributed across industries and size categories, and the audit firms are well represented. We also note that the proportion of losses in our sample is comparable to previous US studies (Burgstahler and Dichev, 1997; Hayn, 1995), ranging from 30% to 35%. We also observed a similar percentage of waived proposed audit adjustments (28.8%) in our sample as reported by Joe *et al.* (2011) at 25.4%. Moreover, our study reports a consistent ratio of downward to upward adjustments (1.8) similar to figures (ranging from 1.4 to 2.56) reported by Kinney and Martin (1994) in their literature review.

Panel A of Table 1 divides the sample by the disposition of the proposed adjustments (recorded vs. waived). The majority of proposed adjustments were accepted by the companies and reflected in the published financial statements. Meanwhile, 28.8% of the proposed adjustments were subsequently waived, calculated based on the number of adjustment lines (or 25.14% based on the number of adjustment entries). This is similar to the 24.2% reported in a prior US study for the sample after the passage of the Sarbanes-Oxley Act (Joe *et al.*, 2011). As shown in Panel B of Table 1, 30% of the observations come from the industrials sector, followed by the consumer discretionary and real estate sectors. When we collected the Singapore audit adjustments data, the auditing firms also manually keyed in the Excel file information about the nature of accounting issues for each adjustment entry. Panels C and D of Table 1 present frequency for each type of accounting issue for adjustments and the proportion of recorded vs. waived adjustments. Examples of accounting issues where the companies clearly have accounting discretion are: "over/under accrual/provision/deferral", "impairment" and "fair value measurements". However, one limitation of this variable is that the 12 audit firms classified 39.6% of adjustments as "others".

3.3 Descriptive statistics of pre-audit earnings, audited earnings and audit adjustments

We separate the sample based on the net impact on earnings. Panel A of Table 2 classifies audit engagements into three groups as net downward adjustments, no impact (net impact of adjustments is nil) and net upward adjustments. There are 344 engagements (27.8%) where earnings are adjusted downward by recorded audit adjustments, compared with 191 engagements (15.5%) where earnings are adjusted upward. The ratio of downward adjustments to upward adjustments is 1.80, which is similar to those reported in prior US studies (Kinney and Martin, 1994) [12]. Hence, downward adjustments are more common than upward adjustments. This is also true when we divide the sample into Big 4 and non-Big 4 auditors. In our sample, for 56.7% of audit engagements, recorded adjustments have no impact on earnings [13]. However, this does not mean audit adjustments occur only in fewer than half of the sample. When we incorporate both recorded and waived adjustments, 1,147 audit engagements (92.8% of 1,236 total engagements) have proposed adjustments. It shows that audited earnings do not correct all the misstatements detected during the audit engagements, and it is necessary to examine *as-if* post-audit earnings.

Firms with downward or upward audit adjustments may have inherent characteristics that could lead to selection bias if we associated these characteristics with the direction of the adjustments. However, our study focuses on the occurrence of small profits and losses (discontinuity around zero), not on these potential associations. This approach should help to reduce the effects of selection bias.

Panel B1 of Table 2 shows the impact of audit adjustments on earnings ($ADJUST_{it}$ = (Pre_E_{it} − $Post\_E_{it}$)/|Pre_E_{it}|). In addition to being more common, the downward

Panel A: Distribution of companies, recorded adjustments and waived adjustments by year and distribution of companies by categories of total assets (average over 2018–2020)

	No. of companies (percentage of company year observations)	Recorded adjustment frequency (amount in S$, million)	Waived adjustment frequency (amount in S$, million)
2018	412 (33.33%)	12,621 (22.166)	4,929 (6,503)
2019	412 (33.33%)	13,624 (19,878)	5,416 (7,473)
2020	412 (33.33%)	13,228 (16,321)	5,597 (6,329)
Total	1,236 (100%)	39,473 (58,365)	15,942 (20,305)

Categories of total assets (based on average assets during 2018–2020)	No. of companies	%
<S$100m	148	35.92
S$100m to <S$250m	78	18.93
S$250m to <S$500m	49	11.89
S$500m to <S$1,000m	40	9.71
S$1,000m to ≤S$3,000m	43	10.44
>S$3,000m	54	13.11
Total	412	100

Panel B: Distribution of companies, recorded adjustments and waived adjustments by industry

	No. of companies (%)	Recorded adjustment frequency (amount in S$, million)	Waived adjustment frequency (amount in S$, million)
Communication services	7 (1.70)	1,368 (1,157)	485 (996)
Consumer discretionary	60 (14.56)	4,850 (6,167)	1,961 (3,109)
Consumer staples	20 (4.85)	2,376 (6,378)	708 (1,863)
Energy	18 (4.37)	1,050 (2,550)	623 (319)
Financials	17 (4.13)	281 (669)	383 (368)
Health care	16 (3.88)	1,222 (1,041)	721 (215)
Industrials	122 (29.61)	14,255 (16,460)	5,797 (4,901)
Information technology	39 (9.47)	4,568 (2,677)	1,611 (377)
Materials	27 (6.55)	3,858 (3,790)	603 (150)
Real estate	43 (10.44)	4,369 (10,724)	1,669 (4,522)
REITS/trusts	27 (6.55)	422 (4,563)	607 (1,060)
Utilities	6 (1.46)	129 (351)	508 (858)
Unknown	10 (2.43)	725 (1,838)	266 (1,567)
Total	412 (100)	39,473 (58,365)	15,942 (20,305)

Panel C: Types of accounting issues for adjustments and proportion of recorded vs. waived adjustments

	All adjustments		Proportion of recorded adjustments among all adjustments by frequency [19](%)	Proportion of recorded adjustments among all adjustments by dollar amounts [20](%)
Types of accounting issues for adjustments	Adjustment frequency	Adjustment amount in S$, million		
1. Revenue recognition	3,794	5,800	59.5	54.5%
2. Recognition of assets/expenses	7,394	5,712	72.0	60.0
3. Over/under accrual/provision/deferral	9,227	5,700	66.0	38.6
4. Impairment	4,497	6,930	65.8	85.2
5. Fair value measurements	1,839	3,559	53.0	55.1
6. Business combination or consolidation or equity accounting	902	3,424	32.0	65.9
7. Tax related	5,808	2,837	69.2	39.0
8. Others	21,954	44,707	79.9	85.8
All types	55,415	78,670	71.2	74.2

Panel D: Percentage of each type of adjustments (all adjustments, recorded adjustments and waived adjustments)

Types of accounting issues for adjustments	All adjustments		Recorded adjustments		Waived adjustments	
	Percentage of each type by frequency(%)	Percentage of each type by dollar amount(%)	Percentage of each type by frequency(%)	Percentage of each type by dollar amount(%)	Percentage of each type by frequency(%)	Percentage of each type by dollar amount(%)
1. Revenue recognition	6.8	7.4	5.7	5.4	9.6	13.0

Table 1. The sample

(*continued*)

2. Recognition of assets/ expenses	13.3	7.3	13.5	5.9	13.0	11.3
3. Over/under accrual/ provision/deferral	16.7	7.2	15.4	3.8	19.7	17.2
4. Impairment	8.1	8.8	7.5	10.1	9.6	5.0
5. Fair value measurements	3.3	4.5	2.5	3.4	5.4	7.9
6. Business combination or consolidation or equity accounting	1.6	4.4	0.7	3.9	3.8	5.7
7. Tax related	10.5	3.6	10.2	1.9	11.2	8.5
8. Others	39.6	56.8	44.5	65.7	27.6	31.3
All types	100.0	100.0	100.0	100.0	100.0	100.0

Source: Table by authors

Table 1.

adjustments are much larger in their effects on earnings than upward adjustments. Specifically, the mean (median) net downward adjustment is 162.6% (0.5%), whereas the mean (median) net upward adjustment is −7.48% (−7.3%). Our findings of the asymmetric impact of audit adjustments on earnings are consistent with prior evidence from the USA and China (Kinney and Martin, 1994; Lennox *et al.*, 2016). The large difference between mean and median for the downward adjustment group is caused by outlier observations with large downward adjustments. However, these outlier observations do not cause severe concern for the inferences of our paper. As a robustness check, we follow Chen *et al.* (2023) and measure audit adjustment using an alternative measure ($ADJUST_{it} = (Pre\_E_{it} - Post\_E_{it})/|Pre\_TA_{it}|$). The results in Panel B2 in Table 2 show the downward adjustments are also larger (27.11%) than upward adjustments (−9.95%) for the full sample.

Our main results (reported in Tables 3 and 5) focus on the occurrence of small profits and small losses in pre-audit vs. post-audit earnings (*as-if* post-audit earnings). In Tables 3 and 5, each outlier observation is included once and is given the same weight as the non-outlier observation. The same principle applies for the transition matrix reported in Tables 4 and 6. Varying winsorization cut-offs for outlier observations of earnings and scaled earnings do not affect our results [14]. This is because extreme outlier values lie outside the small profits/losses categories (ROA within ±0.01, ±0.005 or ±0.02), which are the focal points in Tables 3–7.

Panel C of Table 2 displays total asset categories, which were determined by the regulator ACRA in joint consultations with the industry. ACRA considered the breakdown as representative of Singapore company size profiles into small, medium and large size categories. Panel C of Table 2 shows that audit adjustments (both downward and upward adjustments) occur less frequently for larger companies than smaller companies. This is consistent with the result in Panel B1 of Table 2, which shows that audit adjustments (both downward and upward adjustments) occur less frequently for Big 4 clients than non-Big 4 clients, a trend likely due to larger companies' propensity to engage one of the Big 4 auditing firms. Information asymmetry is correlated with firm size, and larger firms tend to have higher information asymmetry (Armstrong *et al.*, 2011). On the other hand, larger companies have better reporting system and internal control mechanism, resulting in higher quality pre-audit financial statements that require fewer audit adjustments.

Panel D of Table 2 presents descriptive statistics for pre-audit and audited earnings. Before audit, the mean (median) value of unscaled earnings is S$41.05m (S$3.98m), which changes to S$37.42m (S$3.67m) after audit adjustments. Before audit, the mean (median) value of earnings scaled by total assets is −1.28% (1.8%), but after audit adjustments, it is −5.4% (1.67%) [15]. Similar to Panel B1 of Table 2, the disparity between the mean and

Panel A: The relative frequency of downward and upward recorded audit adjustments

	No. of obs.	Downward adjustments ($Pre\_E_{it} > Post\_E_{it}$)		No impact ($Pre\_E_{it} = Post\_E_{it}$)		Upward adjustments ($Pre\_E_{it} < Post\_E_{it}$)	
		N	%	*N*	%	*N*	%
Full sample	1,236	344	27.8	701	56.7	191	15.5
Big 4 auditors	777	159	20.5	510	65.6	108	13.9
Non-Big 4	459	185	40.3	191	41.6	83	18.1

Panel B1: The effects of audit adjustments on earnings: $ADJUST_{it} = (Pre\_E_{it} - Post\_E_{it})/|Pre\_E_{it}|$

	Downward adjustments ($Pre\_E_{it} > Post\_E_{it}$)		No impact ($Pre\_E_{it} = Post\_E_{it}$)		Upward adjustments ($Pre\_E_{it} < Post\_E_{it}$)	
	Mean	Median	Mean	Median	Mean	Median
Full sample	1.626	0.005	0.000	0.000	−0.0748	−0.073
Big 4 auditors	1.070	0.005	0.000	0.000	−0.2165	−0.073
Non-Big 4	2.948	0.003	0.000	0.000	−0.3473	−0.049

Panel B2: The effects of audit adjustments on earnings: $ADJUST_{it} = (Pre\_E_{it} - Post\_E_{it})/|Pre\_TA_{it}|$

	Downward adjustments ($Pre\_E_{it} > Post\_TA_{it}$)		No impact ($Pre\_E_{it} = Post\_TA_{it}$)		Upward adjustments ($Pre\_E_{it} < Post\_TA_{it}$)	
	Mean	Median	Mean	Median	Mean	Median
Full sample	0.2711	0.0036	0.000	0.000	−0.0995	−0.0025
Big 4 auditors	0.0236	0.0021	0.000	0.000	−0.1183	−0.0019
Non-Big 4	0.6519	0.0076	0.000	0.000	−0.0329	−0.0110

Panel C: The frequency of recorded audit adjustments after sorting companies by total assets

	Downward adjustments ($Pre\_E_{it} > Post\_E_{it}$)		No impact ($Pre\_E_{it} = Post\_E_{it}$)		Upward adjustments ($Pre\_E_{it} < Post\_E_{it}$)	
	Frequency	%	Frequency	%	Frequency	%
<S$100m	158	36.3	200	46.0	77	17.7
S$100m to <S$250m	85	36.0	115	48.7	36	15.3
S$250m to <S$500m	36	23.5	91	59.5	26	17.0
S$500m to <S$1,000m	23	20.0	69	60.0	23	20.0
S$1,000m to ≤S$3,000m	27	20.9	87	67.5	15	11.6
>S$3,000m	15	9.1	136	82.4	14	8.5

Panel D Descriptive statistics for unscaled and scaled earnings

	Mean	P5	P25	P50	P75	P95
Unscaled earnings (S$, million)						
Pre_E_{it} (S$)	41.05	−29.90	−2.10	3.98	25.10	318.00
$Post\_E_{it}$ (S$)	37.42	−45.50	−3.46	3.67	25.80	322.00
Earnings scaled by total assets						
Pre_ROA_{it}	−0.0128	−0.2556	−0.0282	0.0180	0.0527	0.1398
$Post\_ROA_{it}$	−0.0540	−0.4393	−0.0352	0.0167	0.0541	0.1501

Table 2.
Descriptive statistics for pre-audit earnings, audited earnings and recorded audit adjustments (N = 1,246 company year observations)

Notes: Variable definition: Pre_ROA_{it} = pre-audit earnings scaled by assets (Pre_E_{it}/Pre_TA_{it}). $Post\_ROA_{it}$ = audited earnings scaled by assets ($Post\_E_{it}/Pre\_TA_{it}$). Pre_E_{it} = pre-audit earnings. $Post\_E_{it}$ = audited earnings. Pre_TA_{it} = pre-audit total assets. The variables Pre_ROA_{it}, $Post\_ROA_{it}$, Pre_E_{it} and $Post\_E_{it}$ are winsorized at 1% for both tails. Note for Panel A: The downward adjustments sample comprises observations where pre-audit earnings exceed audited earnings (i.e. $Pre\_E_{it} > Post\_E_{it}$). The no impact sample comprises observations where there is no difference between pre-audit earnings and audited earnings (i.e. $Pre\_E_{it} = Post\_E_{it}$). The upward adjustments sample comprises observations where pre-audit earnings are less than audited earnings (i.e. $Pre\_E_{it} < Post\_E_{it}$)

Source: Table by authors

Full sample	Full sample	Big 4	Non-Big 4
Panel A: The relative frequencies (in decimals) of small profits (ROA ∈ [0, 0.01]) and small losses (ROA ∈ [−0.01, 0)), full sample has 1,236 company year observations			
Small pre-audit profits: $Pre\_ROA_{it} \in [0, 0.01]$	0.083	0.090	0.072
Small post-audit profits: $Post\_ROA_{it} \in [0, 0.01]$	0.077	0.086	0.061
Difference in frequencies	−0.006	−0.004	−0.011
(*z*-stat.)	(−0.5928)	(−0.2684)	(−0.6626)
Small pre-audit losses: $Pre\_ROA_{it} \in [-0.01, 0)$	0.041	0.049	0.028
Small post-audit losses: $Post\_ROA_{it} \in [-0.01, 0)$	0.041	0.042	0.039
Difference in frequencies	0.000	−0.006	0.011
(*z*-stat.)	(0.000)	(−0.6074)	(0.9136)
Company year observations	1,236	777	459
Panel B: The relative frequencies (in decimals) of small profits (ROA ∈ [0, 0.005]) and small losses (ROA ∈ [−0.005, 0)), full sample has 1,236 company year observations			
Small pre-audit profits: $Pre\_ROA_{it} \in [0, 0.005]$	0.036	0.033	0.039
Small post-audit profits: $Post\_ROA_{it} \in [0, 0.005]$	0.032	0.030	0.035
Difference in frequencies	−0.004	−0.004	−0.004
(*z*-stat.)	(−0.5583)	(−0.4355)	(−0.3495)
Small pre-audit losses: $Pre\_ROA_{it} \in [-0.005, 0)$	0.019	0.019	0.020
Small post-audit losses: $Post\_ROA_{it} \in [-0.005, 0)$	0.018	0.021	0.013
Difference in frequencies	−0.002	0.001	−0.007
(*z*-stat.)	(−0.2977)	(0.1814)	(−0.7810)
Company year observations	1,236	777	459
Panel C: The relative frequencies (in decimals) of small profits (ROA ∈ [0, 0.02]) and small losses (ROA ∈ [−0.02, 0)), full sample has 1,236 company year observations			
Small pre-audit profits: $Pre\_ROA_{it} \in [0, 0.02]$	0.172	0.184	0.329
Small post-audit profits: $Post\_ROA_{it} \in [0, 0.02]$	0.160	0.176	0.133
Difference in frequencies	−0.012	−0.008	−0.020
(*z*-stat.)	(−0.8103)	(−0.3960)	(−0.8492)
Small pre-audit losses: $Pre\_ROA_{it} \in [-0.02, 0)$	0.072	0.082	0.054
Small post-audit losses: $Post\_ROA_{it} \in [-0.02, 0)$	0.070	0.076	0.059
Difference in frequencies	−0.002	−0.006	0.004
(*z*-stat.)	(−0.2353)	(−0.4698)	(0.2856)
Company year observations	1,236	777	459
Panel D: The relative frequencies (in decimals) of losses (ROA < 0), full sample has 1,236 company year observations			
Pre-audit losses: $Pre\_ROA_{it} < 0$	0.344	0.281	0.451
Post-audit losses: $Post\_ROA_{it} < 0$	0.358	0.290	0.473
Difference in frequencies	0.014	0.009	0.022
(*z*-stat.)	(0.7165)	(0.3933)	(0.6620)
Company year observations	1,236	777	459

Notes: Variable definition: Pre_ROA_{it} = pre-audit earnings scaled by assets (Pre_E_{it}/Pre_TA_{it}). $Post\_ROA_{it}$ = audited earnings scaled by assets ($Post\_E_{it}/Pre\_TA_{it}$). Pre_E_{it} = pre-audit earnings. $Post\_E_{it}$ = audited earnings. Pre_TA_{it} = pre-audit total assets
Source: Tables by authors

Table 3. Result of *H1* – discontinuities in the earnings distributions: pre-audit earnings vs. audited earnings (earnings scaled by assets)

median values is attributed to outlier observations. These outlier observations have minimal impact on the conclusions of our paper, because they are extreme values outside the small profits/losses categories, and each outlier is given the same weight as the non-outlier observation in Tables 3 and 5.

Table 4.
Further analysis of *H1* – a transition matrix of profit and loss observations for pre-audit ROA and audited ROA (N = 1,236 company year observations)

Pre-audit earnings scaled by asset (Pre_ROA_{it})	Audited earnings scaled by asset ($Post\_ROA_{it}$)								
	$(-\infty, -0.03]$	$(-0.03, -0.02]$	$(-0.02, -0.01]$	$(-0.01, -0.00)$	$[0.00, +0.01]$	$(+0.01, +0.02]$	$(+0.02, +0.03]$	$(+0.03, \infty)$	Totals
$(-\infty, -0.03]$	294	0	1	0	1	0	0	8	304
$(-0.03, -0.02]$	9	21	1	0	0	0	1	0	32
$(-0.02, -0.01]$	5	4	28	0	0	0	0	1	38
$(-0.01, -0.00)$	5	3	3	37	2	0	0	1	51
$[0.00, +0.01]$	3	0	0	8	83	6	3	0	103
$(+0.01, +0.02]$	1	1	0	3	3	92	3	7	110
$(+0.02, +0.03]$	1	1	0	0	3	3	93	6	107
$(+0.03, \infty)$	6	2	2	3	3	2	4	469	491
Total	324	32	35	51	95	103	104	492	1,236

Notes: Variable definitions: Pre_ROA_{it} = pre-audit earnings scaled by assets (Pre_E_{it}/Pre_TA_{it}). $Post\_ROA_{it}$ = audited earnings scaled by assets ($Post\_E_{it}/Pre\_TA_{it}$). Pre_E_{it} = pre-audit earnings. $Post\_E_{it}$ = audited earnings. Pre_TA_{it} = pre-audit total assets
Source: Table by authors

Full sample	Full sample	Big 4	Non-Big 4
Panel A: The relative frequencies (in decimals) of small profits (ROA ∈ [0, 0.01]) and small losses (ROA ∈ [−0.01, 0)), full sample has 1,236 company year observations			
Small pre-audit profits: $Pre\_ROA_{it} \in [0, 0.01]$	0.083	0.090	0.072
Small *as-if post-audit* profits: *as-if* $Post\_ROA_{it} \in [0, 0.01]$	0.078	0.093	0.054
Difference in frequencies (*z*-stat.)	−0.005 (−0.443)	0.003 (0.176)	−0.018 (−1.085)
Small pre-audit losses: $Pre\_ROA_{it} \in [-0.01, 0)$	0.041	0.049	0.028
Small *as-if post-audit* losses: *as-if* $Post\_ROA_{it} \in [-0.01, 0)$	0.043	0.045	0.039
Difference in frequencies (*z*-stat.)	0.002 (0.200)	−0.004 (−0.360)	0.011 (0.914)
Company year observations	1,236	777	459
P*anel B: The relative frequencies (in decimals) of small profits (ROA ∈ [0, 0.005]) and small losses* (ROA ∈ [−0.005, 0])*, full sample has 1,236 company year observations*			
Small pre-audit profits: $Pre\_ROA_{it} \in [0, 0.005]$	0.036	0.033	0.039
Small *as-if post-audit* profits: *as-if* $Post\_ROA_{it} \in [0, 0.005]$	0.027	0.031	0.020
Difference in frequencies (*z*-stat.)	−0.009 (−1.274)	−0.002 (−0.288)	−0.019* (−1.758)
Small pre-audit losses: $Pre\_ROA_{it} \in [-0.005, 0)$	0.019	0.019	0.020
Small *as-if post-audit* losses: *as-if* $Post\_ROA_{it} \in [-0.005, 0)$	0.023	0.024	0.020
Difference in frequencies (*z*-stat.)	0.004 (0.561)	0.005 (0.694)	0
Company year observations	1,236	777	459
Panel C: The relative frequencies (in decimals) of small profits (ROA ∈ [0, 0.02]) *and small losses* (ROA ∈ [−0.02, 0))*, full sample has 1,236 company year observations*			
Small pre-audit profits: $Pre\_ROA_{it} \in [0, 0.02]$	0.172	0.184	0.153
Small *as-if post-audit* profits: *as*-if $Post\_ROA_{it} \in [0, 0.02]$	0.155	0.180	0.113
Difference in frequencies (*z*-stat.)	−0.017 (−1.141)	−0.004 (−0.197)	−0.040* (−1.750)
Small pre-audit losses: $Pre\_ROA_{it} \in [-0.02, 0)$	0.072	0.082	0.054
Small *as-if post-audit* losses: *as-if* $Post\_ROA_{it} \in [-0.02, 0)$	0.075	0.081	0.065
Difference in frequencies (*z*-stat.)	0.003 (0.308)	−0.001 (−0.093)	0.011 (0.695)
Company year observations	1,236	777	459
Panel D: The relative frequencies (in decimals) of losses (*ROA* < 0)*, full sample has 1,236 company year observations*			
Pre-audit losses: $Pre\_ROA_{it} < 0$	0.344	0.281	0.451
as-if post-audit losses: *as-if* $Post\_ROA_{it} < 0$	0.358	0.292	0.471
Difference in frequencies (*z*-stat.)	0.014 (0.758)	0.011 (0.505)	0.020 (0.596)
Company year observations	1,236	777	459

Notes: *Statistical significance at the 10% levels (two tailed). Variable definitions: Pre_ROA_{it} = pre-audit earnings scaled by assets (Pre_E_{it}/Pre_TA_{it}). As-if $Post\_ROA_{it}$ = as-if audited earnings scaled by assets (as-if $Post\_E_{it}$/Pre_TA_{it}). Pre_E_{it} = pre-audit earnings. As-if $Post\_E_{it}$ = as-if audited earnings under the hypothetical assumption that all proposed audit adjustments were recorded. Pre_TA_{it} = pre-audit total assets

Source: Table by authors

Table 5. Results for *H2* – discontinuities in the earnings distributions in pre-audit earnings vs. *as-if* audited earnings

4. Empirical results

4.1 Results on H1

Figure 1 presents the histograms for pre-audit earnings scaled by assets (Pre-ROA_{it}) and audited earnings scaled by assets (Post-ROA_{it}). The histograms show that the frequency of small losses is greater than the frequency of small profits. The discontinuity in earnings distribution at zero does not appear to differ significantly between pre-audit and audited earnings.

Table 3 provides formal statistical tests on the comparative frequencies of small profits and small losses in the distributions of Pre-ROA_{it} and Post-ROA_{it}. The thresholds we use to define small profits and small losses are consistent with those used by Lennox *et al.* (2016). Panel A defines small profits and small losses at cut-offs of +0.01 and −0.01, respectively; Panel B applies cut-offs of +0.005 and −0.005, respectively; and Panel C applies cut-offs of +0.02 and −0.02, respectively.

If auditing effectively mitigates companies' tendencies to avoid reporting losses through accounting misreporting, we would expect post-audit earnings to show lower frequencies of small profits and higher frequencies of small losses compared to pre-audit earnings (*H1*). However, we do not find such differences. Panels A–C show that the frequencies of post-audit small profits (small losses) are statistically not significantly different from pre-audit small profits (small losses). These results are inconsistent with what would be expected if auditors were constraining loss avoidance and forcing companies to report small losses instead of small profits. Null *H1* is not rejected.

The results in Panel D, which considers all losses instead of only small losses, are consistent with the findings in Panels A–C. Specifically, the frequencies of post-audit losses are statistically not significantly different from pre-audit losses, in the full sample and also

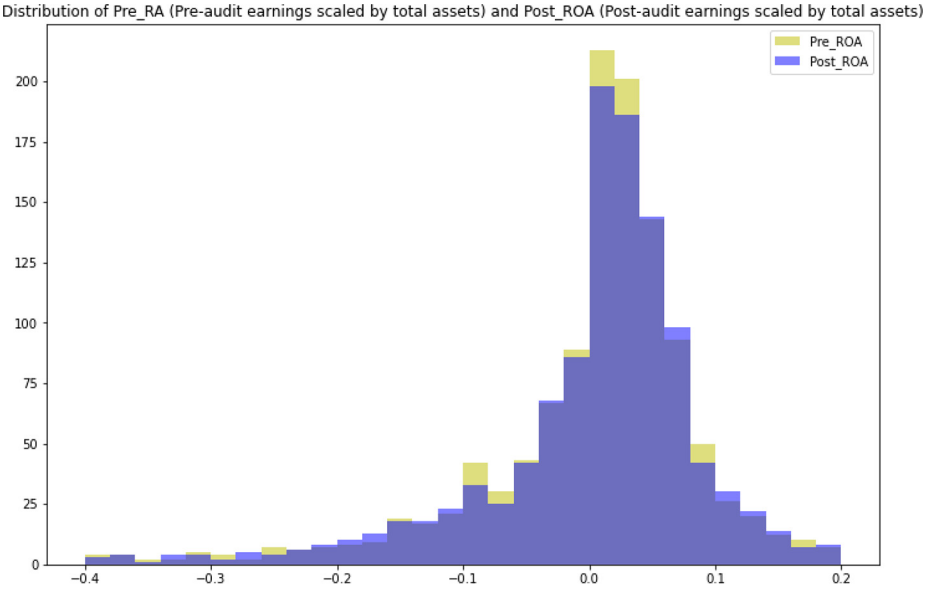


Figure 1.
Discontinuities in pre-audit and audited earnings distribution (earnings are scaled by total assets) (N = 1,236 company year observations)

Source: Figure by authors

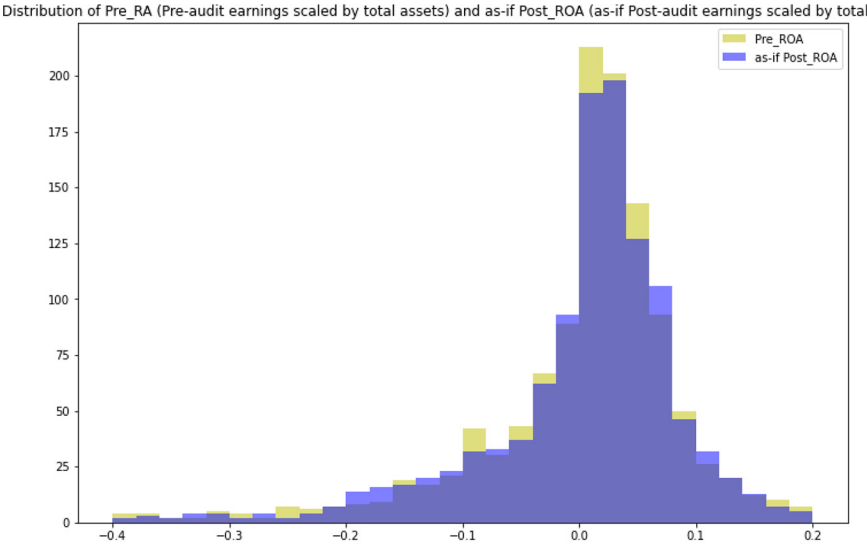
the non-Big 4 and Big 4 sub-samples. In addition, Panel D shows the downward adjustments are more common than upward adjustments, consistent with Table 2.

Table 4 presents further evidence with the transition matrix for the Pre-ROA_{it} and Post-ROA_{it} distributions. It shows that 1,117 observations (90.4% of the sample) remain in the same ROA bands after audit adjustments. Transitions from losses to profits and vice versa are rare. Specifically, there are only 14 observations (1.1% of the sample) where pre-audit losses turned into post-audit profits and only 31 observations (2.5% of the sample) where pre-audit profits turned into post-audit losses. More importantly, Table 4 suggests that auditors do not appear to focus their attention on the group of companies with small pre-audit profits when making downward adjustments. For the group of observations with small pre-audit profits (pre-audit ROA between 0% and 1% band), 10.7% (11 out of 103 observations) transition into lower (negative) post-audit ROA. In comparison, for the group of observations with small pre-audit losses (pre-audit ROA between −1% and 0% band), 21.6% (11 out of 51 observations) transition into lower (more negative) post-audit ROA. Overall, this indicates that there is no evidence auditors make the audit adjustments to reduce the tendency of client companies to report small profits, consistent with Lennox *et al.* (2016).

4.2 Results on H2

Figure 2 presents the histograms for pre-audit earnings scaled by assets (Pre-ROA_{it}) and *as-if* audited earnings scaled by assets (*as-if* Post-ROA_{it}). The earnings discontinuities do not appear to differ significantly between pre-audit and as-if audited earnings.

Table 5 provides formal statistical tests on the comparative frequencies of small profits and small losses in the distributions of Pre-ROA_{it} and as-if Post-ROA_{it}, using various cut-offs to define small profits and small losses similar to Table 3. There is no significant difference observed in the occurrence of small losses before and after auditing when all



Source: Figure by authors

Figure 2.
Discontinuities in pre-audit and as-if audited earnings distribution (earnings are scaled by total assets) ($N = 1{,}236$ company year observations)

proposed adjustments are taken into account. Panels A–C show that, for the full sample and across all cut-offs, the frequencies of as-if post-audit small profits (as-if post-audit small losses) are statistically not significantly different from pre-audit small profits (pre-audit small losses). Null *H2* is not rejected [16].

Our analysis of the non-Big 4 and Big 4 sub-samples does not yield significant or consistent differences in the occurrence of small profits or small losses as hypothesised in *H2*. There is some weak evidence that the incidence of small profits among non-Big 4 clients would be reduced if all proposed adjustments were accepted. Specifically, using the cut-offs of 0.005 and 0.02, frequencies of *as-if* post-audit small profits are slightly lower than those of pre-audit small profits and these differences are statistically significant at 10%. One possible explanation for this result in the non-Big 4 sub-sample is that their clients might have a greater tendency to report small profits. On the other hand, there is no evidence that the frequencies of small losses are significantly higher among clients of non-Big 4 auditors if all proposed adjustments were accepted. Panel D shows that there is no statistically significant change to frequencies of losses if all proposed adjustments were accepted.

Table 6 presents the transition matrix for the Pre-ROA_{it} and *as-if* Post-ROA_{it} distributions. It shows that 1,059 observations (85.7% of the sample) remain in the same ROA band after considering all proposed adjustments. Even after incorporating all proposed adjustments, transitions from losses to profits and vice versa remain rare. In 22 observations (1.8% of the sample), pre-audit losses turned into *as-if* post-audit profits, and in 40 observations (3.2% of the sample), pre-audit profits turned into *as-if* post-audit losses. Compared to the results in Table 4, slightly more companies with pre-audit small profits would transition into small losses if all proposed adjustments were accepted. This suggests that some income decreasing adjustments might have been waived. Specifically, among the group of observations with small pre-audit profits (pre-audit ROA between 0% and 1% band), 16.5% (17 observations out of 103 observations) transition into a negative *as-if* post-audit ROA.

4.3 Additional analysis

Table 7 provides additional analyses on audit adjustments in the sub-sample of the companies with pre-audit earnings around zero. Given the results from Tables 3 and 4, we analyse the recorded audit adjustments (in Panel A) and waived audit adjustments (in Panel B) separately.

Panel A reports the frequency and magnitude of recorded audit adjustments. Across all four groups with pre-audit earnings around zero (near small losses, small losses, small profits and near small profits), the frequency of downward adjustments surpassed that of upward adjustments, consistent with the finding in the full sample. More importantly, there is no evidence that auditors are focusing their attention on companies with pre-audit small profits when making downward adjustments, consistent with the results in Table 4. We find that recorded downward adjustments are less common and smaller in magnitude for companies with small positive pre-audit earnings, compared to companies with small negative pre-audit earnings. For example, for companies with pre-audit small profits, downward adjustments occur at a frequency of 23.3% with the mean (median) magnitude of −1.08% (−0.24%). For companies with pre-audit small losses, downward adjustments are more frequent and occur at the frequency of 35.3% with the mean (median) magnitude of −17.77% (−0.95%). In contrast, such pattern does not exist for the upward adjustments. For example, upward adjustments are more common for companies with small positive earnings, compared to companies with small negative earnings.

Table 6.
Further analysis of *H2* – a transition matrix of profit and loss observations for pre-audit ROA and as-if audited ROA (N = 1,236 company year observations)

Pre-audit earnings scaled by asset (Pre_ROA_{it})		*As-if* audited earnings scaled by asset (*as-if* $Post\_ROA_{it}$)								
		$(-\infty, -0.03]$	$(-0.03, -0.02]$	$(-0.02, -0.01]$	$(-0.01, -0.00)$	$[0.00, +0.01]$	$(+0.01, +0.02]$	$(+0.02, +0.03]$	$(+0.03, \infty)$	Totals
$(-\infty, -0.03]$	291	0	1	0	0	1	1	10	304	
$(-0.03, -0.02]$	11	16	1	0	0	2	0	2	32	
$(-0.02, -0.01]$	3	6	26	1	1	0	0	1	38	
$(-0.01, -0.00)$	5	2	5	35	3	0	1	0	51	
$(0.00, +0.01]$	1	2	3	11	76	5	3	2	103	
$[+0.01, +0.02]$	2	1	1	1	10	78	8	9	110	
$(+0.02, +0.03]$	2	2	0	2	4	5	80	12	107	
$(+0.03, \infty)$	5	1	3	3	3	4	15	457	491	
Total	320	30	40	53	97	95	108	493	1,236	

Notes: Variable definitions: Pre_ROA_{it} = pre-audit earnings scaled by assets (Pre_E_{it}/Pre_TA_{it}). As-if $Post\_ROA_{it}$ = as-if audited earnings scaled by assets (as-if $Post\_E_{it}/Pre\_TA_{it}$). Pre_E_{it} = pre-audit earnings. *as-if* $Post\_E_{it}$ = *as-if* audited earnings under the hypothetical assumption that all proposed audit adjustments were recorded. Pre_TA_{it} = pre-audit total assets
Source: Table by authors

Table 7.
Effect of audit adjustments for companies with pre-audit earnings around zero (small profits and small losses)

Panel A: The frequency and magnitude of recorded audit adjustments: |Sum of recorded audit adjustments on earnings|/|Pre_TA$_{it}$|

	Total firm-year obs.	Downward adjustments (Pre_E$_{it}$ > Post_E$_{it}$)				No impact (Pre_E$_{it}$ = Post_E$_{it}$)				Upward adjustments (Pre_E$_{it}$ < Post_E$_{it}$)			
	N	*N*	%	Mean	Median	*N*	%	Mean	Median	*N*	%	Mean	Median
Near small losses: Pre_ROA$_{it}$ ∈ [−0.02, −0.01)	38	16	42.1%	−0.0388	−0.0060	19	50.0	0	0	3	7.9	0.0731	0.0015
Small losses: Pre_ROA$_{it}$ ∈ [−0.01, 0.00)	51	18	35.3%	−0.1777	−0.0095	27	52.9	0	0	6	11.8	0.0293	0.0058
Small profits: Pre_ROA$_{it}$ ∈ [0.00, +0.01]	103	24	23.3%	−0.0108	−0.0024	60	58.3	0	0	19	18.4	0.0047	0.0021
Near Small profits: Pre_ROA$_{it}$ ∈ (+0.01, +0.02]	110	19	17.3%	−0.0137	−0.0035	74	67.3	0	0	17	15.5	0.0181	0.0080

Panel B: The frequency and magnitude of waived audit adjustments: |Sum of waived audit adjustments on earnings|/|Pre_TA$_{it}$|

	Total firm-year obs.	Downward adjustments (sum of waived audit adjustments is negative on earnings)				No impact (sum of waived audit adjustments is nil on earnings)				Upward adjustments (sum of waived audit adjustments is positive on earnings)			
	N	*N*	%	Mean	Median	*N*	%	Mean	Median	*N*	%	Mean	Median
Near small losses: Pre_ROA$_{it}$ ∈ [−0.02, −0.01)	38	23	60.5%	−0.0008	−0.0004	6	15.8	0	0	9	23.7	0.2452	0.0009
Small losses: Pre_ROA$_{it}$ ∈ [−0.01, 0.00)	51	21	41.2%	−0.0014	−0.0003	14	27.5	0	0	16	31.4	1.0892	0.0008
Small profits: Pre_ROA$_{it}$ ∈ [0.00, +0.01]	103	48	46.6%	−0.0025	−0.0007	19	18.4	0	0	36	35.0	0.0007	0.0004
Near small profits: Pre_ROA$_{it}$ ∈ (+0.01, +0.02]	110	43	39.1%	−0.0015	−0.0006	22	20.0	0	0	45	40.9	0.0007	0.0005

Panel C: The frequency and magnitude of waived audit adjustments for the sub-sample of Big 4: |Sum of waived audit adjustments on earnings|/|Pre_TA$_{it}$|

	Total firm-year obs.	Downward adjustments (sum of waived audit adjustments is negative on earnings)				No impact (sum of waived audit adjustments is nil on earnings)				Upward adjustments (sum of waived audit adjustments is positive on earnings)			
	N	*N*	%	Mean	Median	*N*	%	Mean	Median	*N*	%	Mean	Median
Near small losses: Pre_ROA$_{it}$ ∈ [−0.02, −0.01)	26	18	69.3	−0.0010	−0.0005	3	11.5	0	0	5	19.2	0.0006	0.0005
Small losses: Pre_ROA$_{it}$ ∈ [−0.01, 0.00)	38	19	50.0	−0.0006	−0.0003	8	21.1	0	0	11	28.9	0.0010	0.0008
Small profits: Pre_ROA$_{it}$ ∈ [0.00, +0.01]	70	30	42.9	−0.0016	−0.0004	11	15.7	0	0	29	41.4	0.0006	0.0004
Near small profits: Pre_ROA$_{it}$ ∈ (+0.01, +0.02]	73	25	34.2	−0.0009	−0.0006	10	13.7	0	0	38	52.1	0.0008	0.0005

(*continued*)

Panel D: The frequency and magnitude of waived audit adjustments for the sub-sample of non-Big 4: |Sum of waived audit adjustments on earnings|/|Pre_TA$_{it}$|

	Total firm-year obs.	Downward adjustments (sum of waived audit adjustments is negative on earnings)				No impact (sum of waived audit adjustments is nil on earnings)				Upward adjustments (sum of waived audit adjustments is positive on earnings)			
	N	*N*	%	Mean	Median	*N*	%	Mean	Median	*N*	%	Mean	Median
Near small losses: Pre_ROA$_{it}$ ∈ [−0.02, −0.01)	12	5	41.7	−0.0003	−0.0003	3	25.0	0	0	4	33.3	0.5509	0.0024
Small losses: Pre_ROA$_{it}$ ∈ [−0.01, 0.00)	13	2	15.4	−0.0088	−0.0088	6	46.2	0	0	5	38.4	3.4832	0.0006
Small profits: Pre_ROA$_{it}$ ∈ [0.00, +0.01]	33	18	54.5	−0.0041	−0.0017	8	24.2	0	0	7	21.2	0.0013	0.0010
Near small profits: Pre_ROA$_{it}$ ∈ (+0.01, +0.02]	37	18	48.6	−0.0025	−0.0009	12	32.4	0	0	7	18.9	0.0007	0.0005

Notes: Variable definitions: Pre_ROA$_{it}$ = pre-audit earnings scaled by assets (Pre_E$_{it}$/Pre_TA$_{it}$). Pre_E$_{it}$ = pre-audit earnings. Post_E$_{it}$ = audited earnings
Source: Table by the authors

Table 7.

Panel B presents the frequency and magnitude of waived audit adjustments. We find that waived adjustments are in general much smaller in magnitude than the recorded adjustments which indicates that the recorded adjustments (instead of waived ones) dominate *as-if* post-audit earnings. In companies with small positive pre-audit earnings, downward waived audit adjustments are significantly greater in magnitude than upward waived adjustments (p value = 0.0003), whereas the opposite is found for companies with small negative pre-audit earnings (p value = 0.1966). The evidence in Panel B does not conclusively indicate whether auditors target companies with pre-audit small profits for downward adjustments. Panels C and D show the disaggregation of Panel B into Big 4 and non-Big 4 sub-samples, respectively. There is some evidence suggesting that non-Big 4 auditors tend to focus on their clients with pre-audit small profits for waived downward adjustments, whereas results for the Big 4 sub-sample are mixed. Panel D shows that downward waived audit adjustments are more common and greater in magnitude than upward waived adjustments among non-Big 4 clients with pre-audit small positive earnings. Panel D also indicates that non-Big 4 auditors are more likely to waive downward adjustments for clients with small positive pre-audit earnings than for clients with small negative pre-audit earnings. For instance, among companies with pre-audit small profits (or near small profits), downward adjustments occur 54.5% (48.6%) of the time, compared to 15.4% (41.7%) among companies with small pre-audit losses (or near small losses). These frequencies are significantly different at a level of 0.01. This result further elucidates the finding in Table 5, which suggests that the incidence of reporting small profits by clients of non-Big 4 auditors would have been reduced if the waived audit adjustments were accepted and recorded.

We conduct additional analyses on earnings persistence and find that both pre-audit ROA and post-audit ROA are persistent, with no statistically significant difference in their persistence. Overall, the additional analyses align with our main results, suggesting that auditors do not appear to target companies with small profits in pre-audit earnings and that auditing does not mitigate the earnings discontinuity around zero.

5. Conclusion

Our study examines the impact of audit adjustments on earnings distribution using a unique data set from Singapore. We analyse both recorded and waived audit adjustments, finding that these adjustments do not alleviate the discontinuity in earnings distribution around zero. Our results challenge the underlying assumption in prior audit studies that auditing reduces clients' tendency to avoid losses. As a result, caution should be exercised when using the probability of small profits or losses as a measure of audit quality. In addition, our findings suggest that the earnings discontinuity around zero may not be caused by accounting misreporting, which falls within the scope of auditing. Instead, it may be attributed to practices beyond the realm of auditing, such as real earnings management or allowable accounting choices, or factors unrelated to earnings management [17]. Our research uniquely contributes to the existing literature by analysing waived adjustments and delving into more intricate details of audit adjustments, which were not available in previous studies. In alignment with previous literature, we focus on after-tax earnings. The loss pattern in our data is also comparable to prior research on earnings discontinuity at zero. Our research is more generalisable to other IFRS reporting countries with comparable institutional setting. Our research findings are pertinent to accounting researchers studying audit quality and enhance practitioners' understanding of the nature, size and impact of audit adjustments. In addition, our results provide valuable insights into the distribution of audit adjustments, which can aid stakeholders responsible for governance (board of directors) and monitoring (auditors and regulators) in fulfilling their duties.

However, we acknowledge that our focus on earnings discontinuity introduces some limitations. Firstly, our main results are based on the occurrence of small profits/losses in pre-audit vs. audited (*as-if* audited) earnings. We do not test discretionary accruals or implement regression analyses. We have agreed not to link the audit adjustments to other filings of the client companies due to confidentiality constraints (non-attributable and confidential basis); hence, we are unable to incorporate additional variables, such as discretionary accruals, cash flows from operations, and audit tenure, beyond the variables already available in the data set that we obtained. A mitigating factor is that our findings align with the conclusions drawn by Dechow *et al.* (2003) that there is no evidence of firms attaining small profits through discretionary accruals [18]. Secondly, it is crucial to note that earnings discontinuity around zero represents merely one of several proxies for audit quality commonly used in auditing research, and our paper does not explore the other measures of audit quality.

Confidentiality constraints prevent us from identifying audit clients and their characteristics. Future research could explore whether audit adjustments serve as a vital mechanism linking client firms' earnings quality, particularly when firms face higher agency costs or higher information asymmetries. Auditors, upon observing clients' financial reporting choices, will exercise their judgement to either tolerate earnings management or make audit adjustments. Future research may also examine how a firm's incentives to misrepresent earnings impact audit adjustments and whether audit adjustments limit managers' use of accruals to meet earnings targets. This could be particularly relevant when managers' compensations are tied to such targets. In addition, audit adjustments increase the costs associated with certain discretionary financial reporting choices made by managers, and they limit managers' ability to opportunistically use accruals to achieve earnings targets. Achieving or beating these targets is important to managers because their compensation is often linked to these performance benchmarks. Future studies may also examine how audit adjustments influence earnings quality in companies led by CEOs with elevated compensation incentives.

Notes

1. Recorded adjustments are those that were accepted and passed, whereas waived adjustments are those that were proposed but not reflected in the published financial statements.
2. We use assets instead of price as the scaling variable to minimise issues due to the scaling variable.
3. Singapore Standards on Auditing (SSA) are fully equivalent to the International Auditing Standards, which are globally accepted auditing standards. According to SSA 320, a small misstatement that would turn a loss into a profit should be considered by the auditor as qualitatively material, even if the misstatement is lower than materiality for the financial statements as a whole. Hence, auditors in Singapore, similar to auditors in the USA and China, are expected to mitigate clients' earnings management related to loss avoidance.
4. This issue is not examined in Lennox *et al.* (2016) because the audit adjustments data from China only contain the summarised results before and after audit (such as pre-audit and audited earnings or assets) without any information on waived adjustments. We are able to construct the variable *as-if* audited earnings because the audit adjustments data set from Singapore contains all proposed audit adjustments.
5. Section 4 (p. 111) of Burgstahler and Dichev (1997) discloses that there are 22,510 negative earnings among 75,999 firm year observations in their sample from 1977 to 1994.
6. Hayn (1995) finds that losses appear in 19.6% of the overall sample from 1962 to 1990. Furthermore, there is a dramatic increase in the frequency of losses during the sample period to 30% of losses in late 1980s.

7. Companies only report the pre-audit and audited values of pre-tax earnings to the Ministry of Finance in China.

8. In addition to the audit studies, accounting studies that investigate the causes of earnings discontinuity (Hayn, 1995; Burgstahler and Dichev, 1997; Dechow *et al.*, 2003; Beaver *et al.*, 2007) all focus on net profits, rather than on pre-tax earnings.

9. Listed companies in Singapore are required to apply Singapore Financial Reporting Standards (International), known as SFRS(I), starting from 1 January 2018. SFRS(I) is 100% identical to the International Financial Reporting Standards (IFRS).

10. For example, Chinese Accounting Standards disallow revaluation of property, plant and equipment (PPE), unlike IFRS.

11. The 412 companies are listed on the Singapore Exchange. These companies are clients of the 12 audit firms consecutively for the three-year period in the study (financial years 2018, 2019 and 2020).

12. Kinney and Martin (1994) review nine US studies. Among the seven studies based on audit adjusting entries, the ratio of downward adjustments to upward adjustments ranges from 1.4 to 1.6. The sampling approach is very different for the remaining two studies which report higher ratio of overstatement to understatement in financial statements (2.56 and 13.67). Their samples are based on corrections of published financial reports, which may not be comparable to samples based on audit adjusting entries.

13. In our sample, 60.1% of recorded audit adjustments affect total assets. To focus on the numerator effect (earnings changes during audit engagements), we use the same scaling variable (pre-audit total asset) to compute pre-ROA, post_ROA and *as-if* Post_ROA to ensure our results are not due to the denominator effect.

14. We follow the winsorization threshold outlined in the literature; the variables Pre_ROA_{it}, $Post\_ROA_{it}$, Pre_E_{it} and $Post\_E_{it}$ are winsorized at 1% for both tails.

15. The average assets of negative firm-year earnings fall within the <S$100m band, whereas the average assets of positive firm-year earnings fall within the $250m to $500m band. This explains the negative mean earnings scaled by total assets before and after audit and positive mean unscaled earnings.

16. The null hypothesis is also not rejected if we only take into account proposed adjustments, and not recorded adjustments.

17. Miller (2021) finds that non-profit firms target zero-profit threshold by cutting expenses when faced with small expected losses. As loss avoidance through changes in real activities exists for not-for-profit sector, our findings may also be generalisable to the not-for-profit sector.

18. Our main results are consistent with the notion that earnings discontinuity around zero is not caused by opportunistic accounting misreporting. If we were allowed to link the audit adjustments data with clients' other disclosure, we would expect to find that earnings discontinuity around zero is not achieved through discretionary accruals, consistent with Dechow *et al.* (2003). It seems that the incremental contribution of implementing discretionary accruals in our setting of audit adjustments may not be substantial. It is likely that we would be more affected by measurement errors in discretionary accruals due to our small sample size relative to Dechow *et al.* (2003) which does not require audit adjustments data.

19. The proportion of recorded adjustments by frequency is calculated as the number of recorded adjustments divided by the sum of the number of recorded adjustments and waived adjustments.

20. The proportion of recorded adjustments by dollar amount is calculated as the dollar amount of recorded adjustments divided by the sum of the dollar amounts of recorded adjustments and waived adjustments.

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