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Interim Reporting in Australia

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Suying Zhao declare that this thesis, is submitted in fulfilment of the requirements for the award of the degree of Doctor of Philosophy, in the Business School at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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Abstract

While annual and half yearly (interim) financial reports are both mandatory for listed companies in Australia, much is known about annual reports, but little is known about half yearly reports. This thesis contributes to remedy this situation. Australia provides a unique institutional setting in requiring 'reviewed' half yearly reports. Starting with a general overview of interim reports in Australia, I then examine three aspects of interim reporting: its usefulness to investors, how governance impacts its quality, and market responses to its content.

I examine two attributes of interim earnings: its ability to reflect the performance of the reporting period (reliability) and its ability to indicate annual earnings (indicativeness). The results suggest that interim earnings is not as reliable as annual earnings, and more reliable interim earnings is better able to indicate annual earnings. Moreover, the interim earnings of small firms are relatively less reliable and less indicative.

Next, I explore whether the characteristics of the audit committee are associated with interim earnings quality, as the audit committee is the main internal governance mechanism directly responsible for earnings quality. In this chapter, only audit committee independence is found to be significantly associated with earnings quality.

My final analysis addresses the market response to interim earnings announcements compared to annual earnings announcements. Based on earlier findings in this thesis that interim earnings is less reliable than annual earnings, a weaker market response to interim earnings announcements is expected and found. However, although the difference in interim and annual earnings quality is greater for small firms, there is no corresponding difference in the market response, potentially as a result of a lack of investor attention for small firms. In further analysis, this chapter also reports a greater market response to interim bad news than annual bad news

and a weaker market response to interim good news than annual good news, potentially because investors are aware of the possible deferral of bad news by managers.

Overall, this thesis finds that interim reports exhibit lower reliability compared to annual reports, with greater variability observed for smaller firms. However, market responses to interim and annual earnings do not vary significantly for these smaller firms. Notably, the market response to the type of news contained in earnings differs for larger firms, with interim good news inducing a lower response and interim bad news inducing a greater response than their annual counterparts.

Chapter 1

Introduction

1.1 Overview

An interim financial report is "a financial report that contains either a complete or condensed set of financial statements for an interim period". An interim period is shorter than a full financial year (AASB 134, 2022, para. 4). Interim reports are expected to provide updates on companies' financial status and operations on a timelier basis than annual reports, but this and other characteristics of interim reports have not been systematically investigated in different jurisdictions. In Australia, although annual and half-yearly (interim) financial reports are mandatory for listed companies, comparatively little is known about half yearly reports compared to what is known about annual reports. This thesis contributes to remedy this situation, and in so doing, to advance understanding of the characteristics of interim reports that enhance their usefulness.

The practice of interim reporting dates back to 1910 and is currently mandatory in most jurisdictions (Taylor, 1965), although often with a lower level of assurance than annual reports. Regulations on interim reporting vary across jurisdictions in terms of reporting frequency, assurance level and required content. Partly due to regulatory discrepancies internationally, interim reporting attracts ongoing regulatory interest. An example is the change in Singapore from mandatory quarterly reporting to half-yearly reporting in 2020 for low risk firms (Kajüter, Lessenich, Nienhaus, & van Gemmern, 2021).

Interim and annual earnings announcements are the primary information sources for capital market participants, and the information in the interim report is valued by financial analysts and fund managers (Basu, Duong, Markov, & Tan, 2013; Magena, Kinman, & Citron, 2008). Although interim and annual reports are similar in many ways, the latter have been one of the

most studied topics in accounting research, with knowledge on this topic being comprehensive. In contrast, knowledge on interim reports is fairly limited. While there has been no groundswell to do away with interim reporting, there has been also little interest in interim reports by researchers beyond quarterly reports in the U.S.

The value of interim reporting can be deduced from its longevity and mandatory nature despite its costs. Furthermore, the diversity of regulations internationally may imply a lack of acknowledged best practice on interim reporting and the need for more evidence. The value of the interim report and the need for a greater understanding on the topic motivates this thesis. Focusing on Australia, this thesis examines interim, especially half-yearly reports using similar analytical techniques to those used in analyses of annual reports. It provides an overview, examines characteristics and determinants of their quality, and evaluates the market response to their release.

1.2 Background – International Variations in Interim Reporting

The limited research findings on interim reporting may not be transferrable across institutional settings because of differences in reporting practices and regulations. The research questions in this thesis are investigated in Australia where the research setting is different from that of prior research in four aspects: reporting frequency, assurance level, information environment and required content.

The first prominent difference is reporting frequency. Countries like the United States of America (U.S.) and Canada follow the reporting regime under which the interim period is a quarter, leading to three interim reports, one each for the first three fiscal quarters in a financial year. In contrast, a half-yearly reporting regime is adopted in Australia, the United Kingdom (U.K.), the European Union (E.U.) and Singapore, with one interim report issued in a financial year for the first half-year or six months. There is no consensus in the literature on which regime

is better and this thesis does not compare them directly. The impact of reporting frequency on the research questions will be discussed in each chapter.

The second regulatory difference is the required assurance level. The interim report in the U.S. and Australia needs to be externally reviewed by the auditor, while this is not mandated in the U.K., Canada or the E.U. A review is a type of negative assurance that involves a lower level of responsibility and therefore a lower level of examination (Baines, Tanewski, & Gay, 2000). The external review does invoke a greater market response (Kajuter, Klassmann, & Nienhaus, 2016a; Manry, Tiras, & Wheatley, 2003) without necessarily increasing the earnings quality (Bedard and Courteau, 2015). The externally reviewed half-yearly report combined with the Continuous Disclosure Regime (CDR) makes Australia a uniquely strong setting for exploration of the research questions.

Third, the information environment in Australia differs from that in other places. Under the CDR, *ASX Listing Rule 3.1* requires an entity to disclose immediately any information that is expected to have a material effect on the price or value of its securities. This is backed by Corporations Act 2001 Chapter 6CA, effective from 5 September 1994. Although the New York Stock Exchange (NYSE) and NASDAQ have similar listing rules imposing continuous disclosure obligations on listed companies, they give no private enforcement rights to investors (Golding & Kalfus, 2004) which makes them less effective. Regulation Fair Disclosure (Reg FD) administered by the U.S. Securities and Exchange Commission (SEC) is similar to CDR in appearance, but the former addresses the equality of access to information across different investors while the latter requires all information to be released (Matolcsy, Tyler, & Wells, 2012).

Finally, the required content of the interim report in Australia is different to other jurisdictions. In the E.U., the interim report is in the form of non-financial interim management statements

(IMS) in which managers provide a discussion on business performance and key metrics in the reporting period (Jürgen Ernstberger, Link, Stic, & Vogler, 2017). In Australia, a condensed set of financial statements and external auditor's review report are required because interim report needs to be reviewed as mentioned above.

1.3 Details for each chapter

This section describes the subsequent chapters of this thesis. The second chapter provides a general description of the Australian interim reporting environment. The third chapter examines the quality of interim earnings in relation to annual earnings. The fourth chapter investigates the associations between interim earnings quality and relevant characteristics of audit committees. The fifth chapter compares the market response to interim earnings with that of annual earnings and the sixth chapter provides a conclusion of the thesis.

Chapter 2: Description of Interim Reports in Australia

In the second chapter, an overview of the Australian interim report is provided including its form, content and other characteristics. In summary, the length of the interim report in Australia is around a quarter of the annual report length and the number of notes to interim financial statements is less than half of the number to the annual financial statements. In contrast, the difference between the interim and annual reporting lag is less than three days.

Chapter 3: Interim Earnings Reliability and Indicativeness

In the third chapter, two fundamental characteristics of interim earnings quality are studied - reliability and relevance. The conceptualisation of earnings quality is based on the intended use of the earnings. In terms of interim earnings in Australia, the first use is to reflect on performance during the reporting period (the last six months) and the second use relates to the anticipation of annual earnings. Reliability relates to the use of interim earnings in reflecting business performance. Only accurate and reliable earnings supply a good depiction of the past

performance. Relevance is closely linked to the function of facilitating investors' decision-making. Earnings' predictive nature is highly relevant to investors' financial decisions because investors transact (bet) on the future position of the firms. Unlike the use of annual earnings to predict earnings in future years, interim earnings is used to predict annual earnings of the fiscal year of which the report is a part. To differentiate the relevance of annual earnings to future results and that of interim earnings to current year annual earnings, the terms indicative[1] and indicativeness are used.

Both earnings characteristics are studied in relation to annual earnings. Earnings reliability refers to the ability of earnings to reflect the true economic performance of the reporting entity free from material error and bias (Cheung, Evans, & Wright, 2010). Whether interim or annual earnings is more reliable is the basis of the first research question. Interim earnings might be less reliable than annual earnings because a greater level of managerial estimation is required and because there is less stringent external oversight. It is acknowledged in *AASB 134: Interim financial reporting* that the interim report requires a greater use of estimation methods because the information for the interim period is not as accurate and complete. This is partially because some information, such as tax expense, is not calculated in interim periods. Some information is also not available or not as accurate because interim processes are not as extensive. For example, manually checking of the inventory and impairment testing is only done at the end of the financial year.

There is also a greater opportunity for earnings management in the interim report because of the lower level of assurance and regulatory oversight. Although an external interim review is mandatory in Australia, the level of examination and assurance is not comparable with an audit. The review procedure mostly involves enquiries of managers, which does not provide a basis

[1] Indicative is defined in the Cambridge Dictionary as "being or relating to a sign that something exists, is true, or is likely to happen" (https://dictionary.cambridge.org/dictionary/english/indicative).

for auditors to be able to express an opinion that the financial report gives a true and fair view, or is presented fairly, in all material respects, in accordance with the applicable financial reporting framework (ASRE 2410, 2022, para. 15). Given greater opportunity for earnings management, and the incentive for managers to meet/beat the target and maintain the share price (Bartov, Givoly, & Hayn, 2002), the reliability of interim earnings is expected to be lower.

Prior literature yields different views on the relative reliability of interim earnings compared to annual earnings, chiefly from U.S.-based research. Some authors consider interim earnings to be more reliable because of the perceived lower incentive for manipulation (Das, Shroff, & Zhang, 2009; Makarem & Roberts, 2020), while the opposite view emphasises the lower assurance level in interim reports (Brown & Pinello, 2007). This context of this research distinguishes it from prior research in the U.S. and other countries**.** Despite the difference in reporting frequency in America and Australia, litigation and the regulatory environment also have an influence on financial reporting behaviour and thus earnings quality. Australia has a unique combination of half-yearly reports and mandatory external review together with a strong disclosure and regulatory system.

Earnings reliability is a complex construct and has been proxied by various measures in the literature. This chapter attempts to expand the understanding of interim earnings reliability by using various widely acknowledged measures. The results suggest that interim earnings has higher discretionary accruals and accrual errors than annual earnings. It is also less persistent and smoother than annual earnings. The findings are largely consistent with the expectation of lower interim earnings reliability.

The second research question in Chapter 3 investigates the relation between interim earnings reliability and relevance, in this case, represented by the idea of interim earnings indicativeness discussed above. The relevance and reliability of annual earnings have been seen as a trade-off

because of the use of fair-value measures and the treatment of intangible assets (Dye & Sridhar, 2004; Kallapur & Kwan, 2004; Power, 2010; Schipper, 2003). The relation could be different for interim earnings because its relevance lies in indicating annual earnings, which is a relatively short horizon over which the treatment of fair value measures and intangibles have little influence. In the meantime, manipulations in interim earnings might be reversed to some extent in annual earnings due to audit and to stringent regulatory oversight. The errors and inaccurate estimations in interim earnings might be corrected in annual earnings with more complete information and detailed reporting processes. Hence, more reliable interim earnings will be closer to annual earnings. I expect reliability and indicativeness of interim earnings to be positively related.

In this chapter, an interim earnings indicativeness measure is proposed that measures the level of interim earnings' ability to indicate annual earnings. It is the part of the interim earnings that fails to indicate annual earnings or to reflect the interim performance. The measure is the magnitude of the interim earnings that is not related to the annual earnings of the financial year nor to the macroeconomic factors or firm idiosyncrasies which arise in the interim period. The measure is the absolute value of the residuals from the regression model, and its value is negatively associated with interim earnings indicativeness. The correlation between the earnings reliability measures and the indicativeness measure found in this chapter suggests a positive relation between interim earnings reliability and relevance.

Chapter 4: Interim Reporting Quality and Audit Committee Characteristics

The fourth chapter investigates the relation between audit committee characteristics and interim earnings quality. With the less stringent external oversight on interim reporting, internal governance might play an important role in ensuring interim earnings quality. Investors may

partially rely on corporate governance because they cannot discern earnings quality directly (Beekes, Brown, & Zhang, 2015; Shin & Kim, 2018). Audit committees, one of the internal governance mechanisms, are most closely related to financial reporting quality because they have direct oversight of the financial reporting processes and choose the external auditor. The audit committee has responsibility for interim reporting quality, as it does for annual reporting quality. Therefore, this chapter examines whether independence, accounting financial expertise and female representation on audit committees are characteristics associated with interim earnings quality.

One of the fundamental responsibilities of the audit committee is to ensure timely and accurate disclosure of the financial and operating results of the company (Beverley, 2012). Many studies have examined the association between audit committee characteristics and annual earnings quality in the U.S. and other countries. Independence is seen as a desirable attribute under agency theory because audit committee members with minimal personal incentives are expected to monitor managerial manipulation more effectively (Bedard, Chtourou, & Courteau, 2004b; Bédard & Gendron, 2010). The same applies to accounting financial expertise, as audit committee members with relevant knowledge can better monitor the financial reporting process and review the reported information (Bedard et al., 2004b; Bilal, Chen, & Komal, 2018; Dhaliwal, Naiker, & Naviss, 2010; Sultana & Mitchell Van Der Zahn, 2015).

The consensus on the impact of female representation on annual earnings quality is less clear. A positive influence is suggested based on some identified gender characteristics, for example, females being more risk-averse (Barber & Odean, 2001), diligent (Adams & Ferreira, 2009) and more ethical in decision-making (Krishnan & Parsons, 2008), which might restrain extreme managerial manipulation. In contrast, a positive association is challenged in many ways. First of all, the gender difference may not apply to leadership roles as female and male directors might behave similarly in the same role (Croson & Gneezy, 2009). Also, female

representation has been negatively linked to firm performance and monitoring effectiveness as a result of perceived lower authority/status and tokenism (Grosvold & Brammer, 2011; Vial, Napier, & Brescoll, 2016).

This chapter focuses on whether associations with audit committee characteristics exist for interim earnings quality. Theoretically, there should be positive associations if the audit committee fulfils its responsibilities in relation to interim reporting. To be more specific, a more independent audit committee with accounting financial expertise should be more effective in monitoring and restraining interim earnings manipulation, and thus promote higher interim earnings quality. In practice, however, the audit committee might not exercise the duty in full. Non-executive directors constitute most audit committees adhering to *ASX Corporate Governance Principles and Recommendations (2019)*, which means that these committees have limited operational oversight of financial reporting. With their limited time and activity, non-executive directors are likely to perceive the annual report as a more important subject than an interim report. Consequently, the presumed theoretical association might not exist if the audit committee does not exert its influence on interim reporting. If the audit committee does have an influence over interim earnings quality, however, the relation might be stronger than the annual counterpart. The weakened external oversight on interim reporting might result in more varied interim earnings quality across firms, and the effect of good governance on interim earnings quality may be more pronounced.

Existing literature links audit committee characteristics with interim reporting behaviour including the level of disclosure, voluntary review (Mangena & Pike, 2005; Mangena & Tauringana, 2008) and the choice of mail-out (Chen, Carson, & Simnett, 2007). Yang and Krishnan (2005) examine the association between audit committee characteristics and interim earnings quality directly, finding no association with audit committee independence or financial expertise in the U.S. context.

However, the institutional differences between Australia and the U.S. were expected to have an impact on the research findings in this chapter. Australia might be a research setting in which the relation between internal governance and reporting quality is more pronounced compared to the U.S. because of the greater reliance on internal governance and a greater variance in corporate governance practices. Overall, America has a stronger regulatory system and more stringent rules on corporate governance. Unlike the Sarbanes-Oxley Act of 2002 (SOX) that binds all public firms, Australia has adopted the "comply or explain" approach which allows corporate governance practices to deviate from *ASX Corporate Governance Principles and Recommendations*. The result could be greater variance in corporate governance practices in Australia compared to the U.S. Moreover, a strong regulatory system and greater investor protection could deter earnings manipulation to some extent, which might enhance reporting quality and lessen the effect of other restraining mechanisms (Lee, Lim, & Zhang, 2016). The effect of internal governance on reporting quality in the U.S. might be limited by strong investor protection and regulatory system.

However, after thorough analysis and numerous sensitivity checks, the only association that is identified between audit committee characteristics and interim earnings quality in Australia is for audit committee independence. Audit committee independence is found to be positively related to annual earnings quality, but no significant association is found for other audit committee characteristics, as in Baxter and Cotter (2009). Additionally, the association with audit committee independence is not significant in some sensitivity tests. These findings suggest that the impact of audit committees on increasing earnings quality might not be as robust as hypothesized. It is important to note that this does not imply any indictment of audit committees; rather, it highlights an opportunity to enhance interim earnings quality, recognizing that there is room for improvement.

Chapter 5: Market Response to Australian Interim Earnings

The fifth chapter compares the market response to the interim earnings announcement with the annual counterpart and compares that response to the good news and bad news which appeared between interim and annual earnings. Under the half-yearly reporting regime in Australia, a comparison can be drawn between the market response to the first half-year earnings and the annual earnings of the full financial year. A similar comparison has been explored between the earnings of interim quarters and the fourth quarter under the quarterly reporting regimes of the U.S. and other countries (Alves & Teixeira Dos Santos, 2008; Cornell & Landsman, 1989; Kross & Schroeder, 1990; Lee, Lim, & Zhang, 2016; May, 1971; Salamon & Stober, 1994). The findings may not be transferrable because of the institutional differences between Australia and other research contexts.

Taylor and Tong (2023) argue that the market response to half-yearly earnings might be less strong than quarterly earnings given that half-yearly earnings is not as timely. Much of the information in earnings could have been released within the reporting period especially with the CDR in Australia. In contrast, half-yearly earnings means that the interim report contains six months' of news as opposed to three months, and the CDR may not diminish all of the value of information in earnings because individual events are disclosed but the impact on the overall performance is not clear until the release of the earnings announcements (Rubin, Segal, & Segal, 2017). Moreover, fewer analysts follow Australian companies, suggesting that earnings announcements may be an important channel of news to the market.

For Australian data, I compare the market response to the reviewed half-yearly earnings with the market response to the audited annual earnings. Note that the second half-year earnings is not reported separately. Following credibility theory and the audit effect hypothesis, the market response is expected to be stronger for the audited annual earnings as a result of their higher perceived credibility. The market has been shown to respond more positively to the audited earnings compared to reviewed earnings because of the increased level of assurance and greater

level of examination involved (Haw, Qi, & Wu, 2008; Lee et al., 2016). Recall that the audit review is a type of negative assurance and its effect on improving earnings quality has been challenged (Bédard & Courteau, 2015). Furthermore, the annual earnings number is found to be more reliable and persistent than interim earnings (in Chapter 3) which also suggests a greater market response. As opposed to the mixed findings in prior U.S. research, the hypothesis in this chapter is directional based on the differences in research contexts. The fourth quarter earnings in prior studies were not audited and were susceptible to estimation errors across the interim quarters, indicating a reduced information content in the fourth quarter earnings and thus a lower market response (Gunny, Jacob, & Jorgensen, 2013; Rangan & Sloan, 1998).

Furthermore, the market response comparison between interim and annual earnings varies with firm size (Kross & Schroeder, 1990; Lee et al., 2016). The comparison has been considered to be more pronounced for small firms because the relative interim earnings quality is expected to be lower with relatively weak internal and external oversight in small firms, as found in Chapter 3. If the market reflects the credibility difference efficiently, the comparison should be stronger for small firms. However, listed firms in Australia are smaller compared to U.S. firms and small Australian firms may be so small that interim earnings announcements might not attract enough attention from investors.

I also explore whether the market response to good and bad news differs between interim and annual earnings. The differential market response to interim and annual bad news has long been suggested because of the bad news deferral practice in the U.S. (Kothari, Shu, & Wysocki, 2009; Mendenhall & Nichols, 1988a). Bad news in interim periods possesses greater credibility because releasing bad news when there is an opportunity to withhold goes against perceived managerial practice and incentives (Mercer, 2004). However, the bad news deferral argument

might not apply to the Australian context to the extent that CDR does not allow managers to withhold key information.

The behavioural characteristics of retail investors might also lead to an asymmetrical market response to interim and annual news. Retail investors tend to overreact (underreact) to good (bad) news and they trade on attention (Barber & Odean, 2008). More retail investors might trade on annual earnings because of their familiarity with the concept and greater media coverage it will attract. The overall market could exhibit the trading pattern of the retail investors if the mispricing cannot be offset completely by arbitrageurs due to short-term capital constraints (Shleifer & Vishny, 1997). Therefore, overreaction to annual good news and underreaction to annual bad news might be observed, which implies a relatively lower response to interim good news and a greater response to interim bad news. The results show that the market response is stronger to the annual earnings only for large firms, potentially due to the lack of attention usually given to small firms. Consistent with the bad news deferral argument, the market response to interim bad news is found to be stronger than to annual bad news, and market response to annual good news is stronger than to interim good news. Further analysis does not find evidence on the argument of retail investors' behavioural bias.

1.4 Contribution

This thesis expands our understanding of interim reporting from various perspectives through comparison with the annual report. Prior research on interim reporting has been undertaken in several countries and the results often conflict, possibly because of the differences in institutional settings, reporting practices and research periods. This thesis is distinguished from prior research because of the unique nature of the Australian interim reporting context, although this may also constrain the generalisability of these findings. In this thesis, interim earnings is found to be less reliable yet smoother than annual earnings, and reliable interim earnings helps to indicate annual earnings; interim earnings quality is not associated with the

characteristics of the audit committee; and the market response to interim earnings is less strong for large firms.

These findings are significant for investors making financial decisions based on interim earnings and relying on internal governance as an assurance of the interim earnings quality. This thesis also calls for the need to evaluate the adequacy and the necessity of the regulations on interim reporting. There is a likely benefit in enhancing interim earnings reliability, so that interim earnings could better inform investors and indicate the likely annual earnings. Several approaches might help to achieve this goal. First, I suggest examining the quality and adequacy of the interim review. This does not necessarily involve additional work for the auditor but invites greater emphasis on interim reporting to shift some of the work from the annual audit to the interim review. Recent scandals in audit firms could supply another incentive to strengthen the oversight and regulation of auditors.

Adjusting internal corporate governance could be another approach. Ensuring financial reporting quality is part of the audit committee's responsibility, but the findings do not lend strong support to the argument. No association is found between the examined audit committee characteristics and the interim or annual earnings quality (Baxter & Cotter, 2009). If the type of audit committee that is seen to be more capable of ensuring reporting quality makes little difference in reality, there are two possible explanations. It may be that the audit committee is not functioning as expected or that trying to improve interim earnings quality through audit committee is not an effective approach, especially with the flexible corporate governance rules in Australia. Finally, the preparation of reliable interim reports is costly for firms, and only worthwhile if investors are aware of the importance of interim reporting and use it wisely to inform business decisions. The utility of interim reports in informing investors seems not to be as important for small firms. Moreover, interim earnings of small firms is relatively less accurate perhaps because they lack the resources for preparing interim reports, especially in

the absence of strong manipulative incentives from the capital market. Weighing the cost and benefit, the findings might call for alleviating the burden of interim reporting for small firms. In sum, the findings of this thesis add to the knowledge base and should contribute to better-informed decisions about interim reporting in Australia and beyond.

1.5 Structure of the thesis

The remainder of this thesis is structured as follows. Chapters 2 to 5 comprise the four studies as outlined above. Chapter 6 concludes by summarising the key findings in the papers and discussing the limitations of the present research and suggestions for future work.

Chapter 2

Description of Interim Reporting in Australia

2.1 Introduction

This thesis aims to enhance our understanding of interim reports compared to annual reports. This chapter follows the thesis overview in the previous chapter with a detailed description of interim reporting in Australia to provide the context for the following empirical chapters.[2] This chapter provides some fundamental information on interim reports in Australia including its historical development, regulatory context and current reporting practices. A descriptive analysis is presented on the key characteristics of interim reports based on a representative sample of 26 ASX-listed firms.

This description highlights the importance of the interim report and the inadequacy of what is known about it. Our understanding has not advanced far over the past five decades ago since Brown (1972). Many of his conclusions are still true today. Australia's listed firms have three ways of reporting financial information to the public: in annual reports, in interim reports and in announcements to the Australian Securities Exchange (ASX). The first two - required by company law and ASX listing requirements - are systematised by accounting standards. In addition to other information, both interim and annual reports are required to include general purpose financial statements to inform users about the financial position and financial performance of an entity during the reporting period (AASB 101). These financial reports are pivotal to the decision-making of a wide range of users, even with the profusion of other sources of information, particularly since the advent of the internet (Anderson, 2018).

The third way of reporting financial information to the public - announcements by listed firms - depends on circumstances. These are overseen by the Continuous Disclosure Regime (CDR)

[2] "Interim report" refers to the Australian half-yearly financial report unless otherwise stated.

and are designed to reduce information asymmetry between parties internal and external to the firm and which may impact share price. Some disclosures under the CDR may have a significant impact on share price (e.g. sales by a director who is a substantial shareholder), while others are more procedural (e.g. increase in a director's small shareholding due to participation in a dividend reinvestment scheme). Some disclosures pre-empt significant information in the financial reports such as the early release of yearly or half-yearly profits and/or revenue.

2.2 History

The International Accounting Standards Board (IASB) released a draft of IAS 34 *Interim Financial Reporting* in August 1997 (effective July 1, 1999). This standard was adopted in 2005 by 25 member countries including the European Union (E.U.), Australia (as AASB 134) and New Zealand.

IAS 34 systematised a diversity of international interim reporting practices that can be traced back to 1910 when the New York Stock Exchange encouraged the disclosure of interim statements (Mensah & Werner, 2008). In 1955, the SEC mandated that listed firms release unaudited income statements on a semi-annual basis in the Form 9K (Taylor 1965). This was amended to quarterly reporting in 1962. In the United Kingdom (U.K.), the Accounting Standards Board of Great Britain issued the Statement on Interim Reports and Statement on Preliminary Announcements in July 1998 to provide 'best practice' guidelines intended to supplement the voluntary guidelines earlier established by the London Stock Exchange (Mensah & Werner, 2008).

IAS 34 prescribes the minimum content of an interim financial report, leaving reporting frequency and external assurance level to the discretion of national governments, securities regulators, stock exchanges and accountancy bodies (IAS 34). Firms in the U.S., Canada, China,

Malaysia and Japan follow a quarterly reporting regime while the E.U., U.K. and Australia require half-yearly reports (Tan, 2016). The difference between E.U., U.K. and Australia is that the half-yearly reports in E.U. and U.K. are not required to be externally reviewed while the ones in Australia need to be reviewed by external auditors.

Australian firms officially started publicly providing interim financial statements at semi-annual intervals from December 1994 when Australian Accounting Standard Board Statement No. 1029 (AASB 1029) *Half-Year Accounts and Consolidated Accounts* was published. This was replaced by AASB 1029 *Interim Financial Reporting* in October 2000, and AASB 134 *Interim Financial Reporting* (the Australian equivalent of IAS 34) in 2005.

In Australia, the obligation of a disclosing entity to prepare a financial report each half-year is mandated by the Corporations Act 2001 Division 2 (s302-306) and the content of that report is specified in AASB 134. Given the international differences in reporting frequency in practice, the question of optimal reporting frequency is open to debate in the literature, and several factors have come into play in the discussion including its effect on market efficiency (Mensah & Werner 2008), the cost of equity (Fu, Kraft, & Zhang, 2012) and managerial short-termism (Kraft, Vashishtha, & Venkatachalam, 2018).

Insofar as external assurance is concerned, Canada, the U.K. and Germany do not require any form of assurance for interim reports whereas the U.S., Australia and France require the interim reports of public firms to be reviewed (Kajuter, Klassmann, & Nienhaus, 2016b). ASX Listing Rule 4.1 requires listed firms to submit a set of audited or reviewed condensed financial statements to the ASX in the form of Appendix 4D. Although firms can choose the higher level of assurance – that is, audit – historically very few firms have had their interim reports audited (L. Chen, Carson, & Simnett, 2007). Auditing standard ASRE 2410 *Review of Interim and Other Financial Reports Performed by the Independent Auditor of the Entity* provides

requirements and guidelines on the completion of an interim review (Australian Auditing and Assurance Standards Board, 2008). Research suggests that investors value an external review since it is associated with greater market response (Kajuter et al., 2016a; Manry et al., 2003) although whether it improves earnings reliability and restrains earnings manipulation remains unclear (Bédard and Courteau, 2015).

2.3 General Comparison of Annual and Interim

ASX-listed firms report earnings for the first half-year and the full fiscal year. Unlike the U.S. and other countries with quarterly reporting regimes, where earnings for each quarter are reported, second-half year earnings are not reported separately in Australia.

The annual report communicates the activities, financial results and strategies of the reporting entity for a full financial year. By comparison, the interim report provides similar outputs for information users, but the reporting period is less than the entity's full financial year. In Australia, the interim reporting period is normally the first six months of an entity's financial year. Most disclosing entities are required to prepare half-yearly reports, the exceptions being mining and oil and gas firms, for which quarterly cash and activity reports are required. AASB 134 treats each interim period as a discrete reporting period which rules out re-allocations between periods. Under AASB 134, measurements in interim accounting reports are the same as in annual reports.

The contents of annual and interim reports are similar, but the interim report is more condensed. The annual report generally comprises mandatory disclosures including the director's report, a corporate governance statement, financial statements and the auditor's report on the financial and remuneration statements. Non-compulsory disclosures can also be found in most annual reports including the CEO's and chairman's reports that discuss the firm's performance and strategy. Environmental, Social and Governance (ESG) reporting is also gaining prominence in annual reporting. Visually, the annual report is a public relations exercise and usually

includes a well-designed front cover and a sprinkling of pleasing photographs and diagrams (Penrose, 2008).

In contrast, mandatory disclosures in an interim report are fewer than in annual reports due to timeliness and cost considerations (AASB 134:6). The interim report in Australia must contain a directors' report, a set of financial statements (with condensed notes) and a review report from the external auditor. I observe that interim reports in Australia start with the directors' report as per the Corporations Act s.302. A review of results, strategies, ESG issues and other non-compulsory matters are sometimes briefly stated in the directors' report, or in individual sections. Following the directors' report is a condensed set of financial statements as prescribed in AASB134.

2.4 Sample Comparison of Interim and Annual

As stated earlier, I examined the current half-yearly reports for a representative sample of 26 firms in Australia. I collected the annual and interim reports for these 26 firms for the most recent year at the time of writing: 2022 if available and 2021 if not released at the time of the data collection. To compare half-yearly and annual reports on various metrics, I examined the number of pages and the file size of the reports, notes to the financial statements, the reporting lag and the ASX announcements surrounding earnings announcements. This information is described in Table 1: Panel A lists the measured variables with their definitions and Panel B reports summary statistics.

The difference between the amount of information provided in annual and interim reports can be demonstrated by comparing the summary statistics for the representative sample.

- The average length of the interim report is only 25% of the length of the annual report. I find that the average annual report is 119.73 pages, compared to the average interim report which is 29.96 pages.

- A similar contrast is found for the level of detail, using PDF file size as a measure of information density: the interim report is 21% of the size of the annual report. The average PDF file size was 6008.1 KB for the annual report and 1266.6 KB for the interim report. Most of this difference is due to length, but also to the less elaborate nature of the corresponding interim report, which has fewer photographs for example.
- Less than half the number of explanatory notes are used to supplement interim financial statements (13.92) compared to the number of notes in the annual report (33.04).

In order to determine whether the length and the form of the interim report have changed over time, I also examined the interim reports of the 26 firms in 2012 to compare with their interim reports in 2021/2022. I found:

- The format of the interim report has remain the same since 2012.
- The average size of the PDF file is also similar across the years with 1190.42KB in 2012 and 1266.6 KB ten years later.
- The number of pages, in contrast, has increased from 25.23 to 29.96.

The rising awareness and importance of ESG reporting are reflected more in the annual report than the interim report. Unlike the annual report, which includes extended descriptions and a separate section on climate impact and sustainability issues, the interim report concentrates on the financial performance of the business. In the 26 recent interim reports examined, only two have a section on ESG matters. Both are mining and oil and gas firms (Horizon and Rio Tinto). Another three reports mention climate and sustainability issues in one or two sentences in the directors' report. One of the firms – Qube Holdings Limited – is undertaking a Task Force on Climate-Related Financial Disclosure (TCFD) assessment but did not provide much climate-related information in its half-yearly report.

The auditor's review report for the interim report is different to the audit report for the annual report as it provides a lower level of assurance. None of the firms in the sample had their interim financial statements audited. Unlike audit, the objective of a review is not to obtain reasonable assurance that the financial report gives a true and fair view in accordance with the applicable financial reporting framework (ASRE2410). A review is a form of negative assurance that nothing has come to the auditor's attention that indicates non-compliance with laws and regulations or misstatements through enquiries with the preparers of the financial report. In the review report, auditors are not obligated to discuss key audit matters nor emphasis of matter.[3]

The timeliness of a financial report is an important attribute that contributes to its usefulness. The half-yearly report in Australia must be lodged with the Australian Securities and Investment Commission (ASIC) and ASX no later than 2 months after the half-year-end (with the exceptions of mining and oil and gas exploration entities which have 75 days or 2.5 months). For the representative sample, the average number of days between the end of the interim financial period and the release of the interim report is 51.69 days. Brown (1972) expressed concern over the extended interim reporting lag in Australia, which in the period 1960 to 1969 was an average of 58 days. In over 50 years, this metric has only decreased by 6 days.

For the annual report, although regulators allow 3 months for its preparation after the end of the reporting period, the average annual reporting lag in the sample is 54.23 days. Remarkably this is less than 3 days more than the interim counterpart, even though the amount of information in the annual report is substantially greater. These observations identify some of what is not known about interim reports and suggest interesting topics for future research. Do firms put more resources into the preparation of the annual report? If they do, there are several

[3] The standards on the interim report review do not refer to key audit matters.

potential explanations. Do investors pay more attention to the annual report? Is a greater level of judgement and estimation required for the interim report?[4]

The legal requirement on communicating annual report information to shareholders is greater than for the interim report. For the annual report, the Corporations Act 2001 s.314 requires firms to send a concise annual report to security holders except when a full financial report is requested under s.316, whereas ASX requirements do not clearly specify the communication of interim report results to shareholders. This difference can also be inferred from the wording in the Corporations Act, where communication of the annual report is referred to in Division 4 as "Annual financial reporting to members" while in Division 2 the reference is simply to "half-yearly report and directors' report".

In the sample, I find that the communication of interim results in investor presentations is associated with firm size. Smaller firms are less likely to make investor presentations because fewer users depend on the information. However, the majority of firms (23 out of 26) have investor presentations of interim results on their websites and in ASX announcements, in spite of the lower requirements for communicating interim results.

Information regarding annual results, which comes from the media, analysts, and managers' earnings forecasts, is more varied and more available than that regarding interim results. However, the amount of information provided by the reporting entity in their interim and annual reports through ASX announcements is quite similar. Among the 26 firms examined, interim and annual results are accompanied by the same number of ASX announcements on the earnings announcements date and adjacent days (3 days in total). Both types of reports include on average two or three announcements about the release of the results that are market

[4] Although the same accounting policies should be applied to interim financial statements as to annual financial statements, there is greater uncertainty about accounts like tax expense in the interim period. This means that the interim report requires a greater level of judgement and estimation for this item.

sensitive and sometimes an announcement on the dividend or corporate governance report that are not market sensitive. No other announcement is released in the three-day window in the sample. A market-sensitive announcement is expected to have a material effect on the price or value of the entity's securities and is likely to influence investors' business decisions, following listing rule 3.1 and section 677 of the Corporations Act (2001).

2.5 Conclusion

The interim report is mandatory in most institutional settings, underlining its importance. Although Brown (1972) sees its potential significance as possibly equal to that of the annual report, the interim report has not received as much attention and research evidence on the interim report is also less comprehensive than for the annual report. Much research on interim reporting focuses on the consequences of different regulations including reporting frequency and external assurance.

This chapter provides an overview of reporting practices concerning interim and annual reports in Australia by examining the reports of 26 ASX-listed firms. Some findings, such as the reduced level of detail in half-yearly reports, confirm expectations, but also raise further questions for future research that goes beyond the scope of this thesis. For example, what details are omitted from the interim report? What is common to the notes to the interim and annual reports, and why are some types of notes only in one or the other report? In contrast, the finding about the extended interim reporting lag are surprising and raise further questions. Is it significant, has it consistently been longer, and are there any firms for which it is not the case?

Interim reporting has a long history and yet to date it has not attracted much research attention. With several regulators considering changes to interim reporting regulation like the U.S. and

Singapore (Kajüter et al., 2021), investigation of the issues raised here can make a helpful contribution to policy and practice. As described in this chapter, interim and annual reports are different in various ways. Therefore, in the next chapter, I will further investigate whether earnings quality in the interim report differs from that in the annual report and how earnings reliability affects the interim earnings' ability to indicate the annual earnings.

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Table 1

Panel A: Variable definitions

Variable name	Description
Page	The number of pages of the financial report
Notes	The number of notes for the financial statements
ASO	Whether the half-yearly review report is signed-off by the partner of the external auditor
File size	The size of the PDF file of the financial report
Pg_dr	The number of pages of the directors' report in the half-yearly report
Days	The announcement lag – the number of days between the end of the reporting period and the release of the financial results
Pre	Whether there is an investor presentation of the half-yearly results
ASX	The number of the ASX announcements on the day of the financial results announcements and the adjacent days (day t-1 to day t+1 with t as the earnings announcement date)
BIG4	Whether the half-yearly report is reviewed by a big4 auditor

Panel B: Descriptive statistics

	Half-yearly report (HY)	Annual report (ANN)	t-value
Page	29.9615	119.7308	-7.6061***
Notes	13.9231	33.0385	-16.0209***
Days	51.6923	54.2308	-1.5269
ASX	2.1923	2.5	-1.6903
File size	1266.577KB	6008.077KB	-4.8299***
Pg_Dr	4.4615	-	
BIG4	0.7692	-	
Pre	0.8846	-	
***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, respectively.			

Chapter 3

Reliability and indicativeness in interim reporting

3.1 Introduction

The objective of financial reporting is to provide information about the reporting entity that is useful to decision makers, which means that financial information should have predictive and/or confirmatory value (AASB CF, 2022, para. 2.7). This objective applies to both annual and interim (in Australia, half-yearly) reports, yet research has focused far less on interim than annual reports. The unique role of interim reports is to provide timely information on an entity's performance prior to the end of the financial year, enabling users to form early projections on the full year financial performance (P.K.F. International, 2019). Research has found that interim reports are held in high regard by various stakeholders including analysts and fund managers (Magena, Kinman, & Citron, 2008), and they are a prime information source for the market (Basu, Duong, Markov, & Tan, 2013; Taylor & Tong, 2022). They are also not inconsequential from a preparers' perspective, consuming significant corporate resources in their preparation and presentation.

The pre-eminent characteristics of accounting information discussed throughout the literature are reliability and relevance. Reliability means that financial reports are faithfully presented in a manner reasonably free from errors or manipulations, ensuring they reflect historical performance accurately. Relevance means that financial reports are useful for decision-making. Financial information aids decision-making if it has predictive value, which means the ability to indicate annual performance for interim earnings (AASB, 2019). For interim reports, these characteristics have usually been evaluated in comparison to the annual report. For example, investigations into interim earnings reliability find that interim earnings are more upwardly biased and volatile compared to annual earnings (Doran, 1994; Jeter & Shivakumar, 1999; Lightstone, Young, & McFadden, 2012). In this chapter, I follow this prior approach, and

provide a comprehensive analysis of the interim report's reliability and relevance in comparison to the annual report, focusing on the interim form's predictive and confirmatory information. Interim reporting reliability is defined and measured in comparison to the reliability of annual reports, and interim reporting relevance is defined and measured in terms of how indicative [5] it is for the full year's financial performance (henceforth, its "indicativeness"). Unsurprisingly, for the interim report these two qualities are positively related. Relative reliability enhances the interim's indicativeness for the annual report. The importance of interim earnings reliability has long been emphasised (Seidler, 1967), yet it has received little attention from researchers (Brown & Pinello, 2007; Doran, 2011; Lightstone et al., 2012). Since errors and earnings management undermine the reliability of earnings by impeding its ability to be informative about a firm's financial performance (Dechow, Ge, & Schrand, 2010), knowing the impact of errors and earnings manipulation on interim earnings reliability is important for forming a better expectation of the firm's full year performance. Interim earnings reliability is often compared to its annual counterpart, but the literature holds contrasting views as to which one is higher. For example, Das, Shroff, and Zhang (2009) and Naser and Clare (2020) assume that interim earnings are more reliable because of stronger incentives related to annual earnings management. In contrast, Brown and Pinello (2007) and Casey, Kaplan, and Pinello (2015) consider interim earnings to be less reliable because the audit process at fiscal year-end restrains earnings management. The relative reliability of interim earnings compared to annual earnings in Australia is assessed by various measures in this chapter.

Even less research has explored the indicative nature of interim earnings for annual results. While 'interim earnings' is a statement of what is currently happening in the first six months,

[5] Indicative is defined in the Cambridge Dictionary as "being or relating to a sign that something exists, is true, or is likely to happen" (https://dictionary.cambridge.org/dictionary/english/indicative).

it is also used as a forecasting guide to anticipate annual earnings for the current year. Using interim earnings in this way is more efficient than using the previous year's annual earnings because of its timeliness and the fact that it is a component of the current annual earnings. This predictive nature of interim earnings was studied in a series of early studies that document its usefulness in predicting annual results (Brown & Kennelly, 1972; Brown & Niederhoffer, 1968; Coates, 1972; Green & Segall, 1967; Reilly, Morgenson, & West, 1972). Further evidence in the literature shows that information users adjust their expectation of annual performance by using interim information (Yeung, 2009). However, not much is explored about the indicating attribute of interim earnings apart from the fact of its existence. A measure that quantifies the indicative ability - indicativeness - of interim earnings is needed to enable greater understanding of this nature, for example, comparison among firms and association with other attributes. An indicativeness measure is proposed in this chapter to assess the relevance of interim earnings in terms of its ability to project the full-year result without exploiting the fact that it is itself a stand-alone measure of the first six months while also forming a part of annual earnings. This measure is formulated to be the part of interim earnings that does not indicate annual earnings and is not a result of the industry's interim performance or the firm's historic profitability.

The reporting environment for interim reporting in Australia needs to be understood in the context of international practice, and how those practices have evolved over time. Interim reporting has been mandatory in many countries for decades, with the earliest known requirement being in the U.S. in 1955 (Mensah & Werner, 2008) for the purpose of enhancing communication between a business and its external information users about its past performance. In America, interim reporting is required on a quarterly basis, whereas in the U.K. and Australia most listed companies provide financial reports every six months. In Europe,

there is no mandated period for interim reporting, resulting in diversity of interim reporting frequency in practice.

The Australian reporting environment is compared with the United States (U.S.) where much of the prior literature on interim reporting has been set. In many respects, these research contexts are similar. Under the common law system in both countries, extensive protection is provided to shareholders' (stakeholders') rights. Both countries have efficient markets and developed accounting regulatory systems that serve as external monitoring mechanisms of financial reporting quality. Furthermore, interim reports are required to be externally reviewed in both countries, in contrast to the U.K. and Canada where interim reviews are voluntary.

However, four main differences in interim reporting practices and environments apply between the U.S. and Australia which provide unique advantages in the study of Australian interim reporting. Interim reports are prepared half-yearly in Australia and quarterly in America, Australian reports rely on IFRS whereas U.S reports follow U.S. GAAP, Australian firms are required to disclose value-relevant information to the Australian Securities Exchange (ASX) on an on-going basis (the Continuous Disclosure Regime, CDR), and Australian firms are followed by fewer analysts.

Because they are prepared half-yearly, Australian interim reports provide an indication of about half of the likely annual result, whereas in the U.S., three consecutive quarterly interim reports provide a cumulative indication of about three quarters of the annual result. Australian interim reports are reviewed once within a financial year, whereas in the U.S. three reviews are by necessity faster and less detailed. The half-yearly reports in Australia may be less vulnerable to managerial short-termism, which research has associated with quarterly reporting, and which manifests in the form of real earnings management (Jurgen Ernstberger, Link, Stich, & Vogler,

2017). Real earnings management interferes with business operations, so the Australian setting provides an opportunity to examine earnings quality with less noise from this source.

The U.S. standard that governs interim reporting, ASC 270 *Interim Reporting*, adopts the integral approach under which expenses can be re-allocated between interim periods within a financial year. In contrast, AASB 134 *Interim Financial Reporting*, which is the Australian equivalent of the international standard IAS 34 *Interim Financial Reporting,* treats each interim period as a discrete reporting period which rules out re-allocations between periods. Under AASB 134, interim accounting measurements are the same as in annual reports.

From a regulatory perspective, the Continuous Disclosure Regime (CDR) in Australia provides another point of difference. CDR requires an entity to disclose immediately to the ASX any information that is expected to have a material effect on the price or value of its securities. The U.S. has different mechanisms that promote information disclosure including Regulation Fair Disclosure (Reg FD) which focuses on unequal disclosure to some external parties rather than full disclosure to all external parties. In the U.S. greater analyst coverage occurs as the firms are significantly larger. Greater analyst coverage might function as a monitoring mechanism that ensures timely disclosure. In contrast, it might also exacerbate earnings management as a result of greater market pressure (Huang, Pereira, & Wang, 2017).

On balance, I expect that these differences in regulation and participation do not result in substantial differences between the information environments of the two countries (Taylor & Tong, 2022). Based on prior research and the unique context of interim reporting in Australia, interim earnings is hypothesized to be less reliable than annual earnings for two main reasons. First, there is less stringent external oversight on interim reporting from auditors and regulatory bodies. Second, the pressure to beat target earnings is present in interim periods and greater managerial estimation is required in interim reporting preparation (Bartov et al., 2002). For

interim earnings indicativeness, a novel measure of indicativeness is suggested and is hypothesised to bear a positive association with interim earnings reliability.

This chapter makes several contributions that will be of interest to different stakeholder groups. It enriches our knowledge of interim earnings quality which will be of interest to standard setters and financial regulators who need empirical evidence to understand the implications of related policies (Leuz, 2018). Interim reporting is important to the market (Kajüter, Lessenich, Nienhaus, & van Gemmern, 2022), although its lower reliability may undermine its usefulness. This research provides a clearer understanding of interim earnings which allows regulators to consider the necessity and cost of more stringent requirements and oversight on interim reporting.

The findings will also be useful to investors and auditors. Understanding information quality is essential for making wise investment decisions. The results indicate that investors should be sceptical about the reliability of interim earnings. Considering the lower interim earnings quality of smaller companies, the results in this chapter support the call by Christensen, Newton, and Wilkins (2021) that encourages increasing interim audit effort for greater annual reporting timeliness. Furthermore, the results also indicate that an increase in the reliability of interim earnings would provide a more accurate indication of annual earnings, which would benefit individual investors and overall market efficiency. These benefits provide a motivation for a greater level of interim review effort.

This chapter also contributes to the academic literature on earnings quality and interim reporting. The widely-accepted earnings quality measures from prior literature are applied here in a different setting – interim reporting. The interim indicativeness measure introduced in this chapter is the first quality measure designed specifically for interim earnings. Unlike popular annual earnings quality measures that are determined by financial statement items from the

firm's financial reports, this measure explores a new approach that incorporates a range of external factors.

This chapter proceeds as follows. In section 2, a literature review on financial reporting quality and interim reporting is provided, followed by hypothesis development. Section 3 gives detailed descriptions of the empirical design and model specifications, and also the data selection and sample distribution. Section 4 reports the main empirical results and section 5 reports additional analyses. Concluding remarks are in section 6.

3.2 Literature review and hypothesis development

3.2.1 Financial reporting quality

Financial reporting quality is a broad and complex construct. Historically, financial reporting quality and its constitutive construct earnings quality have been defined in terms of reliability, relevance, comparability and understandability (Cheung, Evans & Wright, 2010; SAC 3, 1990). In spite of extensive research on the concept of earnings quality, the determinants and the consequences of earnings quality (Dechow et al., 2010), no consensus has been reached on its definition or best proxies. The heterogeneity of the interpretation and application of earnings quality measures is of concern in accounting research (Ewert & Wagenhofer, 2015; Perotti & Wagenhofer, 2014).

The most frequent component of quality explored in recent research is reliability (Abbott, Daugherty, Parker & Peters, 2016; Carrera, Sohail, & Carmona, 2017; Bhuiyan, Rahman, & Sultana, 2020). Reliability refers to whether the financial information reflects the economic truth free from material error and bias (Cheung et al., 2010). Reliability includes several earnings attributes such as intentional manipulation, earnings accuracy and conservatism.

Accounting research relies on a cohort of proxies to represent the construct of earnings quality including persistence, smoothness, predictability, conservatism, accruals quality, discretionary

accruals, earnings response coefficients, benchmark beating and restatements. These measures depict earnings reliability from various perspectives. Dechow et al (2010) classify them into three broad categories: properties of earnings, investor responsiveness and external indicators. Perotti and Wagenhofer (2014) categorize the measures four ways: time-series, smoothness, accruals and value relevance.

3.2.2 The relation between interim and annual earnings reliability

In this section, the complexity of the relation between reported interim earnings and reported full-year earnings is explored. The ambiguous relation between reported interim earnings and reported full-year earnings provides a rich setting in which to study interim reports.

As previously stated, the literature generally compares interim earnings and its characteristics to the full-year equivalents. Prior research using data from the U.S. has provided fragmentary evidence on interim earnings reliability by examining specific items in the interim report, such as pension costs (Blankley, Comprix, & Hong, 2013), tax (Comprix, Mills, & Schmidt, 2012) and restructuring charges (Moehrle, 2002). However, the literature lacks an overarching analysis of the reliability of interim earnings as information for investors and standard setters.

The accrual component of earnings is generally considered to be more susceptible to earnings manipulation because the cash flow component is a verifiable fact, while the accruals are more elusive. An accrual amount is the difference between the accounting value of the transactions and the value of the cash movement. It arises due to the need for reports over a defined period. If the period was infinite, the accrual would be zero because all the cash would be paid and received. A shorter period, In contrast, will capture more of the timing differences related to the cash movement. Interim reports cover shorter periods and, by nature, tend to include more accruals. Furthermore, the same number of accruals accounts for a higher percentage of the

reported expense for shorter periods. For example, accrued wages of one week might represent 1.9% of the annual expense, but 3.8% of the half-yearly expense.

In theory, earnings reported for the interim (half-year or first three quarters) plus earnings reported for the second half-year or final quarter equal the annual result. However, unlike the fourth quarter report in the U.S., Australia's second half-year report is not separately disclosed. Furthermore, while the interim results supply the earlier parts of the annual results, the relation between interim and annual is not transparent or easy to discern in practice. Unlike cash flow reporting, where the annual net cash flows less first-half cash flows must equal second-half cash flows, accrual accounting involves estimates and judgement. Some of those estimates and judgements may relate to both the interim and full-year reporting periods, whereas others may relate only to the full year. This is recognised as "estimates that require management's most difficult, subjective or complex judgements" (ASA 540, 2019, para. A49).

The reliability of all financial results is influenced by unintentional errors and intentional earnings management. In the case of interim reports, there are likely to be more errors than in annual reports because the available information for the interim period is not as accurate and complete as for the full year. For example, tax expense and cost-production matching can only be known at year-end. Some items may only be estimates in the interim report because the company only counts inventory and engages an external actuary at fiscal year-end. Time and cost-saving considerations also impede the interim report from reaching the same level of quality as the annual report. Financial report preparation is not cheap. AASB134 requires companies to apply the same impairment testing and recognition as for the annual report, but also recognises that they would not undertake the same process as is used at the end-of-year. This potential inaccuracy mainly applies to accrual accounts because cash transactions are less subject to estimation and discretion.

The accounting standards for interim reporting do not require information to be as detailed and refined as for annual reporting. AASB 134 requires companies to apply the same accounting policies to their interim financial reports as are applied to their annual financial reports, but it also recognizes that interim measurements involve more estimation and discretion than annual measurements. The threshold for materiality is also higher in interim reports. Accounts like year-end bonus, contingent lease payment and tax expense can only be calculated at the end of the fiscal year. The managerial estimation required in the interim report undermines the level of accuracy and provides an opportunity for greater discretion. In the U.S., research that focuses on individual items in interim reporting found high degrees of cosmetic earnings management (Guan, He, & Yang, 2006) and cost manipulation (Blankley et al., 2013).

The level of intentional earnings management may be determined by both incentives and opportunities to manipulate earnings. Some studies argue that there are fewer incentives for interim earnings management compared to annual earnings because debt covenants and bonus compensation are linked to annual results (Jeter & Shivakumar, 1999). However, managers still face pressure to beat or meet earnings expectations (Bartov et al., 2002), to reach budget targets and to maintain increased earnings per share (Myers, Myers, & Skinner, 2007). Furthermore, there is also evidence that missing an interim earnings target adversely impacts the CEO bonus (Matsunaga & Park, 2001). On balance, the incentives for interim earnings management still exist.

At the same time, the absence of external audits and less stringent regulations leave management with more opportunities to manipulate earnings in interim periods. Due to interim reporting being half-yearly in Australia, earnings reliability may be even lower than in countries with quarterly reporting if the longer reporting period provides more time for earnings management.

The audit effect hypothesis proposes that there is a smaller market reaction to interim earnings as a result of the different level of audit assurance which lowers the perceived earnings quality (Lee et al., 2016). In Australia (as in the U.S.), even though an external interim review is mandated, the assurance level is not the same as for an audit. An audit of an annual report requires auditors to obtain sufficient and appropriate evidence to provide reasonable assurance that the financial report is free from material misstatement. The restraining effect of audit is illustrated by findings in Brown and Pinello (2007) that managers show a lower propensity to manage earnings upward or to avoid negative earnings surprises in the annual financial period compared to the interim period. Casey et al. (2015) find that benchmark-beating behaviour is less common in the annual compared to the interim, with the effect being more pronounced for big N audit firms.

The objective of a review engagement is to provide a moderate level of assurance through the issue of a report that encompasses a statement of "negative assurance" (Baines et al., 2000). The review process involves enquiries that enable the auditor to express a conclusion on whether there is evidence to cause him/her to believe that the interim financial report is not prepared, in all material respects, in accordance with an applicable financial reporting framework (ASRE 2410, 2020). In the absence of the same level of assurance as an audit, managers have greater opportunity to manipulate earnings if they miss the expected level. Bédard and Courteau (2015) question the quality of the interim review. They find that a timely review is not associated with either improvement in interim reporting quality or the frequency of adjustments in the last quarter. Lin and Yen (2017) compare reviewed interim results and voluntarily audited interim results, finding the latter to be more value relevant which indicates that investors perceive an audited report to be more reliable and accurate.

In addition to the lower level of assurance, interim reporting also receives less regulatory oversight than annual reporting. Australian Securities and Investments Commission (ASIC)

investigates potential breaches of accounting regulations and laws in annual reporting. This regulatory oversight provides a deterrent to accounting manipulation that is not applied to interim reporting. A few early attempts to compare interim and annual earnings find lower variability in interim earnings. Doran (1994) investigates the discrepancy of earnings from analyst forecasts and concludes that interim earnings are overstated compared to fiscal-year earnings. Lightstone et al. (2012) proxy the volatility of the net income as the range between the lowest and the highest earnings within 4 years and notice a significantly smaller fluctuation for interim periods. This can be interpreted as insufficient care by management in interim periods or earnings management at fiscal year-end.

Overall, the reliability of interim reports compared to the annual counterpart can be argued both ways. On one hand, interim reports can be more reliable than annual reports as a result of the comparatively shorter period in which to manage earnings. On the other hand, it is reasonable to expect that interim earnings are not as reliable as annual earnings due to the lower level of audit examination and higher incentives to elevate earnings. Therefore, I propose the following hypothesis:

H1: Interim earnings reliability is not significantly different from annual earnings reliability.

3.2.3 Interim earnings indicativeness

In this section, prior research and the context of interim reporting in Australia are discussed to develop a hypothesis on the relation between interim reporting reliability and its indicativeness, a construct which represents how well the interim report indicates what will be reported in the annual report.

Earnings need to have predictive value to be relevant for information users' decision-making.[6] From the perspective of the earnings attribute itself, earnings with greater predictive value is more relevant to investors' decision-making.

In particular, the interim earnings report is relevant because of its ability to indicate annual performance. Forming and adjusting an expectation of annual performance based on interim earnings is taken for granted in practice. Although Yeung (2009) has documented related evidence, little other research explores the indicative nature of interim earnings. To contribute to the understanding of this process, the construct of interim earnings' indicativeness of annual results is introduced and its relation to interim earnings reliability is examined. Reliability and relevance are specified as the two primary qualitative characteristics of accounting information by FASB but their relation to each other is not clearly stated in the conceptual framework (Kadous, Koonce, & Thayer, 2012). While they have been seen as independent (Maines & Wahlen, 2006) or positively related (Duncan & Moores, 1988), the majority of prior studies considers the relation between annual earnings reliability and relevance to be a trade-off (Barth & Landsman, 1995; Dye & Sridhar, 2004; Healy, Myers, & Howe, 2002; Kallapur & Kwan, 2004).

An argument for the trade-off is evident in the debate over using fair value. Fair values are more useful for predicting future information but provide greater opportunity for errors and manipulation (Barth & Landsman, 1995; Power, 2010). The same logic applies to the treatment of research and development expenses and other intangible assets (Barth & Clinch, 1998; Healy et al., 2002; Kallapur & Kwan, 2004). Another argument for the trade-off between reliability and relevance is the aggregation procedure. Different methods of aggregating information will affect managers' incentives to misreport (Dye & Sridhar, 2004).

[6] Investors do not transact on the historical performance of companies. They transact on what they expect to be the future performance. One important source of information for future performance is earnings announcements.

These conjectures are all based on annual earnings, but do not necessarily apply to the case of interim earnings reliability and indicativeness. Unlike the capacity for annual earnings to predict cash flow and earnings in subsequent and future years (Lev, Li, & Sougiannis, 2009), the interim earnings result is used to anticipate the annual earnings result of which it is a part. Therefore, the relation between the relevance and reliability of interim earnings is not clear because of the inherent difference between the predictive nature of annual earnings and interim earnings.

As discussed earlier, interim reports are prone to more unintentional errors due to the less accurate and complete information compared to annual reporting. Many of these errors are corrected towards the end of the fiscal year as more information on accounts measurement becomes available. Thus, minimizing accrual errors in interim earnings enhances their ability to reflect the annual result. Also as discussed in the previous section, the less stringent external oversight and greater use of managerial estimation in the interim report may lead to earnings management. However, interim accruals management is likely to be reversed in the full-year results which face external audit and scrutiny from regulatory bodies (Jurgen Ernstberger et al., 2017). Once again, I expect that fewer errors in interim earnings enables interim earnings to better indicate the annual result. Also, lower interim discretionary accruals are expected to enhance the ability of interim earnings to indicate annual results. Overall, a positive association between interim earnings indicativeness and reliability is expected. I propose a second hypothesis to reflect this expectation:

H2: Interim earnings indicativeness is positively associated with interim earnings reliability.

3.3 Models, Data and Sample Selection

3.3.1 Model for Reliability of Interim Earnings

The first hypothesis to be tested relates the reliability of interim earnings to the reliability of annual earnings. The multivariate model to test this hypothesis, model 1, is shown below. It includes measures of interim and annual earnings reliability, and an indicator (dummy) variable (INT) set as 1 for interim data and 0 for annual data. The coefficient β_1 on INT captures the difference between interim and annual earnings reliability measures. Model 1 also includes control variables for audit, financial and governance factors that have been shown in the prior literature to impact earnings reliability.

The indicator variable is the test variable that distinguishes whether interim earnings reliability is significantly different from annual earnings reliability. Earnings reliability is tested using various measures including accruals measures, earnings persistence and smoothness. Following prior literature, the accruals measures include two widely acknowledged measures: the Modified Jones model and the Dechow and Dichev model. The first is the absolute value of the discretionary accrual measure from Dechow, Sloan, and Sweeney (1995), widely referred to as 'the Modified Jones model' because Dechow et al. (1995) modified the original model in Jones (1991). Non-discretionary accruals are estimated as a function of changes in revenue and property, plant and equipment, and changes in net receivables (Dechow et al., 1995). The absolute value of discretionary accruals is used to ensure consistency with other earnings reliability measures, as these measures are constructed based on magnitude rather than capturing the income-increasing or income-decreasing nature of earnings. The second accruals measure is the accrual errors volatility from Dechow and Dichev (2002) which measures the volatility of the accrual errors that are not associated with operating cash flows of the current and the adjacent years. Both measures are widely adopted in the reporting quality literature (Tanyi & Smith, 2015; Rubin & Segal, 2019; Abbott, Daugherty, Parker, & Peters, 2016).

Details of the estimation of these measures are included in Appendix A. Both measures are estimated separately for annual earnings and interim earnings. The values of both measures are inversely associated with earnings reliability.

In this study, earnings persistence and smoothness measures are also used to enable a comprehensive understanding of the interim earnings attribute. Earnings persistence captures the sustainability of the earnings into future periods. More persistent annual earnings are taken as a sign of higher earnings quality. Earnings persistence is measured following Francis et al. (2004) as specified in Appendix A (A.4). Accrual measures can be positively related to earnings persistence because discretionary accruals and accrual errors reverse in the subsequent period (Hanlon, 2005). Recurring earnings also demonstrates a firm's ability to generate sustainable earnings over time. Interim earnings persistence may be lower than the annual because accounting errors may be corrected, and discretionary accruals may be reversed in the second half-year with more accurate information to hand and in the face of external scrutiny.

The earnings smoothness measure reflects the relative volatility of accrual earnings compared to cash flow volatility. The academic view and interpretation of earnings smoothness is not clear. Some view managers' smoothing efforts as manipulation (DeFond & Park, 1997), but smoothing is also seen as a favourable attribute. Demerjian, Lewis-Western, and McVay (2020) suggest that managers smooth earnings in the interests of other stakeholders and Baik, Choi, and Farber (2020b) find smooth earnings can better predict future earnings if exercised appropriately. As an indirect measure of earnings reliability, the sign of earnings smoothness may not directly relate to higher or lower earnings quality. Although earnings being smoothed does not fully reflect the financial performance of the current period, it might contain more information about future performance (Baik et al., 2020b).

Earnings smoothness is measured as the ratio of earnings volatility to operating cash flow volatility following Leuz, Nanda, and Wysocki (2003) and Francis, LaFond, Olsson, and Schipper (2004). A greater value suggests that accrual earnings are more volatile compared to cash flow. This is desirable according to some researchers as it implies that accrual earnings are less subject to smoothing manipulation (Francis et al., 2004; Leuz et al., 2003). In contrast, some researchers believe that a high value impairs the predictive and valuation abilities of earnings (Baik, Choi, & Farber, 2020a).

Relative interim earnings reliability compared to annual earnings reliability is tested in the Ordinary Least Squares (OLS) regression model:

$$Earnings\ measures\ = \alpha_1 + \beta_1 INT + \beta_2 Size + \beta_3 ROA + \beta_4 CFVOL + \beta_5 BIG4 + \beta_6 Leverage + \beta_7 MTB + \beta_8 M\&A + \beta_9 BDIND + \beta_{10} BDFEM + \varepsilon \quad (1)$$

Where:

Earnings measures include:

DA = discretionary accruals measured as the residual from the regression in model (A.1) (Modified Jones model) for the firm-year;

DD = accrual quality measured as in model (A.2) for the firm-year;

Smoothness = earnings smoothness as in model (A.5) for the firm-year;

INT = indicator variable that takes the value of 1 for interim data and 0 for annual data;

BIG4 = dummy variable that takes the value of 1 if the firm-year is audited by one of the Big4 audit firms in Australia (Ernst & Young, Deloitte, KPMG and PWC) and 0 otherwise, for the firm-year;

SIZE = the natural log of total assets for the firm-year measured at the end of the period;

ROA = return on assets (operating income before extraordinary items over total assets) for the firm-year;

CFVOL = operating cash flow volatility (the standard deviation of operating cash flow divided by lagged total assets) for the firm-year;

LEV = total assets divided by shareholders equity for the firm-year;

MTB = market to book ratio measured as the current price per share divided by the book value of equity for the firm-year at the beginning of the period;

M&A = dummy variable that takes the value of 1 if the firm is either an acquirer or a target in a merger and acquisition (hereafter M&A) transaction in the fiscal year and 0 otherwise;

BDIND = board independence measured as the percentage of independent directors on the board in the fiscal year;

BDFEM = female representation on the board measured as the percentage of female directors on the board in the fiscal year.

H1 expects interim earnings to be less reliable than annual earnings. Given the negative association between the value of accrual measures and earnings reliability, the coefficient on the interim dummy variable (INT) is expected to be significantly positive for accrual measures suggesting higher accruals for interim earnings. Due to the equivocal interpretation of the association of the smoothness measure with earnings reliability, there is no anticipation on the direction of the coefficient on INT. A positive coefficient on INT indicates greater volatility and less smoothness of interim earnings compared to annual earnings. A negative coefficient indicates lower volatility and more smoothness of interim earnings compared to annual earnings. The prior literature has guided the choices of control variables. The auditor effect on

earnings reliability is controlled by the variable BIG4 (Tanyi & Smith, 2015; Carrera, Sohail & Carmona, 2017; Dhaliwal, Naiker & Navissi, 2010; Bedard, Chtourou & Courteau, 2004).

I control for several financial characteristics. Large firms may have greater incentives to manipulate earnings as a result of greater analyst scrutiny (Chih, Shen, & Kang, 2008). I control for this using the natural log of total assets for the firm-year. ROA (return on assets) controls for firm profitability (Rubin & Segal, 2019; Bhuiyan et al., 2020). Earnings volatility is controlled by CFVOL (operating cash flow volatility) following Demerjian, Lev, Lewis and McVay (2013), Dhaliwal, Naiker and Navissi (2010), and Abernathy, Herrmann, Kang, and Krishnan (2013). Firm risk is controlled using LEV which measures leverage as total assets over shareholder's equity (Sharma & Iselin, 2012; Sultana & Van der Zahn, 2015).

Market to book ratio (MTB) is found to be negatively correlated with discretionary accruals (Menon & Williams 2004) and is often used as a control variable (Demerjian et al., 2013; Dhaliwal et al., 2010; Abernathy et al., 2013). Firms that are either a target or an acquirer in a M&A in the fiscal year is also controlled for, because of the effects on cash flows (Sharma & Iselin, 2012; Marshall, Schroeder & Yohn, 2019; Zhang, 2019). BDIND and BDFEM control for the effects of the firm's corporate governance (the percentage of independent directors on the board and the percentage of female directors on the board, respectively). All continuous financial variables are winsorised to mitigate the effects of extreme observations.

3.3.2 Model for Indicativeness of Interim Earnings

The second hypothesis to be tested relates interim earnings indicativeness (its ability to indicate annual earnings) to interim earnings reliability.

To measure interim earnings indicativeness, a model is developed that relates interim earnings to annual earnings and to other macroeconomic, industry and firm-idiosyncratic factors. The residual from this model reflects the part of interim earnings that is not related to or indicative

of annual results and is not related to these key economic factors. The magnitude of the difference is interpreted as an inverse measure of interim earnings' indicativeness. This model is not an earnings forecasting model, as it is determined ex post using annual information.

The model incorporates the following economic factors. Macroeconomic factors are the general economy-wide trends for the period which have a fundamental influence on expected business performance. Industry factors are the specific factors associated with the firm's industry that affect all firms in that industry. To capture these influences, the average industry performance in the interim period is included in the estimation ($IndE_{j,t-0.5}$). The industry average performance in interim periods should reflect both macroeconomic influence and industry characteristics.

A variable for the idiosyncratic characteristics of individual firms is also included to capture firm-specific factors and seasonal effects[7] that impact profitability. This variable ($IndDev_i$) is proxied by the standardised difference between the firm's and the industry's interim performance.[8] $IndDev_i$ is positive (negative) if on average the firm's interim earnings are higher (lower) than the industry earnings and the magnitude increases with the level of deviation. It is estimated using all years in the sample period, because the average characteristics of the firms related to their interim earnings is measured. This variable shows the average deviation of firm interim performance from industry performance. Individual firms may have greater interim profitability than the industry average as a result of higher profitability in general or relatively higher profits in the interim periods (or both). The variable is positive (negative) if the firm performs better (worse) than the industry in the interim period, with the value increasing (decreasing) with the magnitude of the deviation.

[7] Seasonal effects may be a result of the nature and location of individual businesses.
[8] This is measured as the t-value of the mean test between a firm's interim earnings and industry average earnings in all years within the sample period.

The third variable in the estimation model is the annual earnings for the current full year ($E_{i,t}$). This is included to capture the relation between interim earnings and the full-year results. It also helps to incorporate firm-specific business factors like the growth or contraction of the firm within the year. This model for interim earnings indicativeness, shown below as model (2), measures the extent to which interim earnings indicate the annual earnings result after incorporating the inherent differences between interim and annual periods.As mentioned previously, this model is different from earnings forecasting models as it is determined ex post with annual information available. In this model, interim earnings is the dependent variable instead of annual earnings.

The value of the measure is negatively associated with interim earnings indicativeness.

$$E_{i,t-0.5} = \alpha_0 + \beta_{0,j}E_{i,t} + \beta_{1,j}IndE_{j,t-0.5} + \beta_{2,j}IndDev_i + \varepsilon \quad (2)$$

Where:

$E_{i,t-0.5}$= interim earnings in year *t* for firm *i* measured as the interim net operating profit after tax divided by lagged interim total assets;

$E_{i,t}$= annual earnings in year *t* for firm *i* measured as the annual net operating profit after tax divided by lagged annual total assets;

$IndE_{j,t-0.5}$= the average interim earnings for GICS industry j in year *t* excluding the interim earnings of firm *i* in year t;

$IndDev_i = \frac{\overline{E_{i,t-0.5}} - \overline{IndE_{J,t-0.5}}}{\sqrt{\frac{{s_i}^2}{n} + \frac{{s_j}^2}{n}}}$ the statistical value (t-value) of the mean test on the difference between interim earnings for firm *i* and the average industry earnings for all years in the sample period.

For example, an observation (SEA in 2007) with a large value for the indicativeness measure of 1.0658 indicates that the interim earning ($E_{i,t-0.5} = 0.9976$) is not indicative of the annual earning ($E_{i,t}$ = -0.1755), and this difference is not explained by industry performance ($IndE_{j,t-0.5}$ = -0.0523), despite the firm generally outperforming the industry average ($IndDev_i = 1.3052$). In contrast, an observation (EGG in 2014) with a small value for the indicativeness measure of 0.0000 suggests that the interim earning ($E_{i,t-0.5} = 0.0066$) is indicative of the annual earning ($E_{i,t} = 0.0095$) and/or the difference is explained by industry performance ($IndE_{j,t-0.5} = 0.0383$) and/or by specific factors where the firm's interim earnings are generally lower than industry performance ($IndDev_i = -1.3437$).Following H2, interim earnings reliability is expected to be positively related to interim earnings indicativeness, and so I predict that the indicativeness measure – the magnitude of residual of the model – will be significantly correlated with the accruals measures.

3.3.3 Data and sample selection

The data selection process is summarised in Table 1 Panel A. Initially, all companies listed on the ASX with interim and annual financial data during the period 2005 to 2018 are included. I start in 2005 because AASB 134 came into effect in that year. Financial information is obtained from DatAnalysis. Audit and board information are sourced from Connect4. There are 1,784 firm-year observations with less than five years of data within the sample period being excluded, leaving a final sample of 666 firms and 6,349 firm-year observations. That is, my sample includes a total of 12,698 firm-year observations that have an interim and annual observation.

The distribution of observations by GICS industry sectors is presented in Table 1 Panel B, which shows that the materials sector accounts for the highest proportion of the sample (22.54%). These firms are mandated to report quarterly on their financial position and project

progress. Mining companies also have greater earnings volatility including a higher chance of incurring a loss. The industrials (17.28%), consumer discretionary (13.54%), health care (11.14%) and energy sectors (10.66%) each account for more than ten percent of the sample. The financial (4.95%), consumer staples (4.38%), communication services (4.08%), and utilities (1.75%) sectors each represent a much smaller proportion of the sample.

The sample distribution by year is presented in Panel C of Table 1. The annual sample size increases steadily from 2005 (4.93%) through to 2010 (8.24%) and then decreases gradually to 5.81% in 2018. The sample comprises listed and delisted firms, so this distribution pattern is not attributable to survivorship bias.

[insert table 1 here]

3.4. Empirical results

3.4.1 Descriptive statistics

The summary statistics for the whole sample are presented in Table 2 Panel A. Big4 audit firms audited more than half (56.73%) of the sample companies. The average market to book ratio is 2.7125. If interpreted as a proxy of future growth, this means that on average ASX-listed companies are not expected to grow rapidly in the foreseeable future. The mean return on assets (-0.8831) is negative, signalling that the average Australian company is making a loss. The high negative value for the minimum ROA shows that some companies are making a loss that is greater than the value of their assets. On average, one quarter (25.26%) of the board members in the sample are independent and female directors only account for 9.89% of the directors on the boards.

Univariate tests between interim and annual earnings quality measures are presented in Table 2 Panel B. The second and third columns show the mean values for interim and annual periods respectively. The absolute value of discretionary accruals is 0.0691 for interim earnings and

0.0604 for annual earnings, with the difference being significant (p<0.01). This initial evidence is consistent with upwards earnings manipulation in the interim periods. The accrual errors volatility is also significantly higher in the interim periods (0.0731 vs 0.0395).

[insert Table 2 here]

3.4.2 Empirical results

The first hypothesis investigates the relation between interim earnings reliability and annual earnings reliability. The results for estimates of equation (1) are presented in Table 3. H1 is rejected, and the results suggest that interim earnings reliability is significantly lower than annual earnings reliability. Column (1) reports the results for the first measure of discretionary accruals [Abs(DA)]. The coefficient on INT is significantly positive (β_1 =0.0074, p<0.01), indicating that interim discretionary accruals are significantly greater than the annual counterparts. The results for the accrual errors volatility measure (DD) shown in Column (2) are consistent with the results for Abs(DA). The coefficient on INT is significantly positive (β_1 =0.0331, p<0.01), suggesting that accruals quality is lower for interim earnings. The results when the earnings smoothness measure is the dependant variable as in equation (1) are shown in Column (3), which indicate that interim earnings are smoother compared to annual earnings (β_1= -0.2710, p<0.01).

[insert Table 3 here]

The relative interim earnings persistence is tested as in model (A.4). The interaction between $EBIT_{i,t}$ and INT measures the difference between annual earnings and interim earnings persistence. If β_3 is negatively (positively) significant, then interim earnings is statistically less (more) persistent than annual earnings. The results of interim earnings persistence compared to annual earnings persistence are shown in Table 4 Column (1). The coefficient on the

interaction term is significantly negative (β_3 = -0.0415, p < 0.01) suggesting that interim earnings are less persistent than annual earnings.

[insert Table 4 here]

The relations between interim earnings indicativeness (INMEA) and the accruals measures are shown in Table 5. The second hypothesis predicts a positive association with the indicativeness measure. Panel A presents the correlations between these measures. All three measures are positively correlated with INMEA, consistent with the explanation that more reliable interim earnings are more indicative of the full-year result. The results show that a higher level of interim earnings errors and manipulations impedes the ability of interim earnings to indicate annual results accurately.

The tendency for the changes in accruals measures to increase with the interim earnings indicativeness measure (INMEA) is shown in Panel B. Firm-years are sorted into quintiles based on the value of the interim earnings indicativeness measure (INMEA). Panel B displays the values of INMEA and the accruals and smoothness measures for each portfolio. Both discretionary accruals and the volatility of accrual errors increase across the quintiles of the indicativeness measure. This relation is shown visually in Figure 1. The values of the accruals measures increase monotonically with increases in INMEA. The magnitudes of discretionary accruals [Abs(DA)] and accrual errors volatility (DD) are positively related to INMEA. Figure 2 shows the movement of the smoothness measure with increases in INMEA, also revealing an increasing pattern. Interim earnings that reflect past performance with greater accuracy are more indicative of annual performance for the year and thus are more valuable to decision-making by information users.

[insert Table 5 here]

3.4.3 Additional analysis and sensitivity tests

This section includes additional analysis and sensitivity tests to check the robustness of the main results. Several possible issues are investigated including the size effect associated with earnings reliability, potential survivorship bias, the use of other earnings characteristics to measure earnings quality, the impact of annual asset impairment, the use of other predictability measures, and a one-stage model approach.

Size effect on interim earnings reliability

I check whether the relation between interim earnings reliability and annual earnings reliability varies with the size of the firm. Prior research proposes two reasons for such a relation: the impact of auditing and scrutiny from the share market.

Interim reporting quality is expected to be relatively higher for larger companies because a greater percentage of them are audited by Big4 firms, and research suggests that Big4 audit firms provide higher audit quality (Dye, 1993; Lennox, 1999). Auditors are "in residence" at large firms during the interim reporting period (Kross & Schroeder, 1990; Salamon & Stober, 1994; Lee et al., 2016). Given the complexity of auditing large companies and the need to disseminate annual reports on a timely basis, auditors are more likely to take a careful and thorough look at the interim reports to avoid repeating this work in the final period. This argument supports the hypothesis that large firms have fewer opportunities than small firms to manipulate earnings.

In contrast, there are several reasons to expect that earnings manipulation is lower for smaller firms. Small firms face less scrutiny and pressure from the share market compared to large companies that are constantly watched by analysts and investors. Small firms also have more limited resources for preparing interim financial reports. The interim report for a small firm is

more of a product of compliance than a signal to investors. As managerial compensation and debt covenants are linked to annual results, small firms may be affected by this incentive to manipulate the annual report but not the interim report.

To determine the effect of firm size on interim earnings reliability, the sample is categorized into large and small firm subsamples according to the value of total assets, and the test is repeated for each subsample. As shown in Table 6, the finding that interim earnings are relatively less reliable compared to annual earnings applies to both small and large firms. The coefficient of INT is significantly positive for each of the subsamples, but the magnitude is greater for small firms. For the discretionary accruals measure [Abs(DA)], the coefficient on INT for large firms (β_1 = 0.0046, p<0.01) is significantly lower than its counterpart for small firms (β_1 = 0.0105, p< 0.01) at 0.05 significance level (chi2 = 4.77, p = 0.0290). As for the accrual errors volatility measure, the coefficient for large firms is lower than for small firms at 0.01 significance level (chi2 = 59.29, p < 0.01). Although the first hypothesis applies to both small and large firms, the gap between interim and annual earnings reliability is smaller for large firms, consistent with the conjecture in Kross and Schroeder (1990), Salamon and Stober (1994) and Lee et al. (2016). Columns (5) and (6) show results on the earnings smoothness for large and small firms respectively. The coefficient is only significant for the small firm subsample (β_1= -0.5385, p<0.01) and is not significant for the large firm subsample. The earnings persistence of small and large firms are exhibited in Panel B, and the findings are qualitatively similar to the earnings smoothness: there is only a significant difference for small firms but not for large firms. This is also consistent with the results for the two accruals measures which show that the earnings quality difference between interim and annual earnings is more pronounced for small firms.

[insert Table 6 here]

The effect of survivorship bias

The sample includes both listed firms and delisted firms with more than five years' data from 2005 to 2018. Delisted firms are ones that are not listed at the end of the sample period. A stock may be delisted from the ASX for various reasons including takeovers, M&A, privatization, business failure, the illiquidity of the shares, change of names and violation of listing rules. It is hard to characterize the attributes of delisted stocks into one set. Stocks delisted voluntarily might reflect good performance, for example privatization and M&A. They may also be delisted because of financial difficulties or for violation of listing rules, which are related to poor performance or low earnings quality.

Survivorship bias is not a concern in the main tests as delisted firms are included in the sample, but I investigate whether the main results conceal a systematic difference between delisted firms and listed firms. The results for listed and delisted subsamples are presented in Table 7. Two findings can be drawn from the results. First, survivorship bias is not a significant issue in this research because the results for the listed subsample are qualitatively similar to the results of the main test which comprises the whole sample. The coefficients on INT are significantly positive for both measures.

Second, there is a systematic difference between the listed and delisted subsamples. The coefficient on INT for the discretionary accruals measure is significantly positive for the listed subsample (β_1 = 0.0082, p<0.01) but not significant for the delisted subsample. This might be a result of lower reliability of delisted firms' annual earnings. Target candidate companies in a M&A transaction have incentives to manage annual earnings in order to increase the transaction value (Lim & Chang, 2017). Companies with financial difficulties also have incentives to manage annual earnings to attract funds and survive. This might decrease the credibility gap between interim and annual earnings.

[insert Table 7 here]

The effect of asset impairment

Although it is explicated in AASB134 that a reporting entity should "apply the same impairment testing, recognition and reversal criteria at an interim date as it would at the end of its annual reporting period", it is recognised that it is unlikely that the interim process will be as detailed as for the annual report. Firms might only review the interim report for indications of significant impairment, whereas for the annual report, different procedures render asset impairment as more likely to occur. I test whether asset impairment is part of the explanation for the higher accruals in the interim period using two approaches.

First, an estimate of annual asset impairment is added as a control variable and, second, the interim earnings is adjusted by the amount of asset impairment in the year. The annual asset impairment is estimated as follows:[9]

$$Impair = PPE_t + Capital\ expenditure_t - Depreciation_t - PPEsales_t - PPE_{t+1}$$

In adjusting interim earnings for asset impairment, the amount of the impairment is deducted from interim earnings and the discretionary accruals result is generated using the impairment-adjusted earnings. Table 8 column (1) shows the results with asset impairment as a control variable and column (2) shows the results for the impairment-adjusted interim earnings. The significance level and directions of the coefficients on INT remains the same, indicating that the absence of asset impairment in the interim periods is not the reason for higher interim discretionary accruals. Thus, the alternative explanation that different asset testing procedures in the interim periods lead to higher accruals can be excluded.

[9] Asset impairment measures are not provided in the Morningstar database I have used. Gains and losses on sale are not disclosed in the firms' reports, and so are excluded from my estimates of impairment.

[insert Table 8 here]

Other predictability measures

The interim earnings indicativeness measure developed in this chapter resembles the concept of earnings predictability. A popular earnings predictability measure is the square root of the error variance from an autoregressive model of annual earnings (Francis et al., 2004; Hasan, Park, & Wu, 2012; Lipe, 1990). I regress interim earnings on annual earnings at a firm-year level over a ten-year window. The square root of the error variance *(RMSE)* from the model indicates the overall accuracy with which interim earnings predicts annual earnings.

The correlations between the accruals measures, interim earnings indicativeness and the predictability measures are shown in Table 9. All measures are positively correlated with the earnings predictability measure at 0.01 level as expected. The indicativeness and predictability measures are naturally related by construction. Furthermore, the relation of the predictability measure to accrual errors volatility (DD) is closer than it is to discretionary accruals [Abs(DA)]. The predictability and the accrual errors volatility (DD) measures represent the level of accuracy by the variance of regression errors, and the indicativeness and discretionary accruals measures represent the level of accuracy by the magnitude of deviation from a modelled expectation. Although they are all correlated, the associations are stronger for measures using similar approaches.

[insert Table 9 here]

One-stage model

Many researchers are concerned that the two-stage approach to including measures of earnings quality introduces an omitted variables problem, so a one-stage model approach is adopted as a sensitivity test. Earnings accruals is used as the dependant variable in model (A.3) and the variables in the Modified Jones model are added to the control variables. Table 10 column (1) presents the main results and columns (2) and (3) show results for large and small firms respectively. The results are consistent with our previous finding that interim accruals are significantly higher than annual accruals (β_1 = 0.0121, p < 0.01) and the difference is more significant and more pronounced for small firms. Additional analysis lends further support to H1 that interim earnings quality is lower than annual earnings quality.

[insert Table 10 here]

Comparison between mining versus non-mining sample

Some characteristics of firms in the materials sector, which largely consists of mining firms, are found to differ from those of firms in other sectors. Mining firms account for 22.5% of the sample. To address this potential source of bias in my findings and to check the robustness of my results, observations from the materials sector are excluded and the main tests are repeated on interim earnings reliability. The results shown in Table 11 are that interim earnings have lower reliability for both the material sector sample and the sample excluding observations from the material sector. Hence, the main findings are not sensitive to the inclusion or exclusion of mining firms.

[insert Table 11 here]

Other additional tests

The accruals measure for financial firms is different from firms in other industries due to the unique nature of its operation. Therefore, I examine whether the findings persist in the financial sector and in a sample excluding the financial sector. The untabulated results are qualitatively

similar with the main results. I also test whether including and excluding the 2007-2009 period makes a difference as a result from the impact of the global financial crisis. The findings remain the same.

3.5 Conclusion

Although the interim report is a well-established reporting phenomenon, this chapter shows that its quality is not comparable to that of annual reporting. Exploring two attributes of interim earnings – its ability to reflect historical interim performance (its reliability) and its ability to indicate annual performance (its indicativeness), and using various earnings reliability measures, this chapter reports that interim earnings quality is lower compared to annual earnings, especially for small firms. An interim earnings indicativeness measure is developed to quantify interim earnings' ability to indicate annual earnings. As expected, this measure is positively associated with accruals measures. Earnings with deemed better accuracy and less manipulation are better indicators of future performance. The indicativeness measure provides a new approach to understanding and evaluating interim earnings.

This chapter adds to the interim reporting and earnings quality literature by contributing knowledge about interim earnings quality that can be of use to regulators, investors, auditors and lenders. It helps regulators to discern the effectiveness of existing accounting rules and to conceive forward-looking regulations on interim reporting. The findings also enable other information users to examine interim earnings in a more thorough and clear way to make financial decisions. They provide robust evidence on the relative reliability and indicativeness of interim earnings and raise the issue of the appropriate level of assurance that might be applied to half-yearly reports in Australia.

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Table 1 Sample

Panel A: Sample Selection

ASX-listed companies with complete data	8,133
Less data with less than five years	1,784
Number of firms in the sample	666
Number of firm-year observations in the sample	6,349
Total observations	12,698

Panel B: Distribution of Observations by Industry

GICS code	Sector description	Observations	Percentage
10	Energy	677	10.66%
15	Materials	1,431	22.54%
20	Industrials	1,097	17.28%
25	Consumer Discretionary	854	13.45%
30	Consumer Staples	312	4.91%
35	Health care	707	11.14%
40	Financials	314	4.95%
45	Information Technology	576	9.07%
50	Communication Services	259	4.08%
55	Utilities	111	1.75%
60	Real Estate	11	0.17%
	Total	6,349	100.00%

Panel C: Distribution of observations by year

Year	Observations	Percentage
2005	313	4.93%
2006	358	5.64%
2007	424	6.68%
2008	483	7.61%
2009	523	8.24%
2010	523	8.24%
2011	522	8.22%
2012	521	8.21%
2013	508	8.00%
2014	510	8.03%
2015	466	7.34%
2016	430	6.77%
2017	399	6.28%
2018	369	5.81%
Total	6349	100.00%

Panel A present the sample selection process and **Panel B** reports the sample distribution by GICS industry sectors. **Panel C** presents the year-wise distribution of observations for the sample period 2005-2018

Table 2 Summary statistics and Correlations

Panel A: Sample Summary Statistics

Variable	Mean	Std. Dev.	Median	25%	75%	Min	Max
BIG4	0.5673	0.4955	1	0	1	0.0000	1.0000
TA	1.41E+09	4.96E+09	9.61e+07	2.44e+07	4.91e+08	1.44E+05	4.03E+10
size	18.5959	2.1937	18.3807	17.0099	20.0113	11.8776	24.4208
leverage	2.0238	1.5755	1.6324	1.2611	2.1773	-7.0364	16.7893
MTB	2.7125	3.8285	1.57	0.85	3.02	-17.4600	36.5700
SVOL	12.5240	433.9721	0.1809	0.0860	0.3605	0.0000	15470.0600
CFVOL	1.0961	33.5577	0.0730	0.0357	0.1367	0.0000	1196.2380
ROA	-0.8831	12.2964	0.0721	-0.1759	2.4	-344.860	26.6500
BD_ind	0.2526	0.1525	0.25	0.1429	0.3636	0.0000	0.7500
BD_fem	0.0989	0.1128	0.0769	0	001667	0.0000	0.6667
DA_abs	0.0647	0.1295	0.0380	0.0167	0.0775	0.0000	0.4198
DD	0.0563	0.0671	0.0368	0.0192	0.0683	0.0000	1.0893
INMEA	0.0609	0.1854	0.0260	0.0110	0.0546	0.0000	6.0891
smth	1.3939	2.8216	0.8557	0.5406	1.2992	0.0060	55.0130

Panel B: Univariate tests of interim and annual earnings reliability measures

	Interim	Annual	Difference
Variable	**Mean**	**Mean**	**t-value**
ABS(DA)	0.0763	0.0652	4.8296
DD	0.0731	0.0395	29.0925
SMTH	1.2660	1.5215	3.8847

Panel C: Pearson Correlation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Abs(DA) (1)	1													
DD (2)	0.1554	1												
Smth (3)	0.0648	-0.0336	1											
INT (4)	0.0536	0.2643	-0.0453	1										
Size (5)	-0.199	-0.2562	-0.0858	0.0037	1									
ROA (6)	-0.1809	-0.1354	-0.0763	-0.0634	0.2458	1								
SVOL (7)	-0.0027	-0.0198	-0.0044	-0.026	0.0432	0.0021	1							
CFVOL (8)	0.0006	-0.0165	-0.0046	-0.0263	0.0398	0.0003	0.9999	1						
BDFEM (9)	-0.0664	-0.0418	-0.0238	-0.0009	0.2399	0.061	0.019	0.0174	1					
BDIND (10)	-0.074	-0.0685	-0.008	-0.0011	0.3318	0.0607	0.006	0.0057	0.1676	1				
BIG4 (11)	-0.1076	-0.1821	-0.0509	-0.0009	0.5398	0.0678	0.0222	0.02	0.1611	0.2235	1			
Leverage (12)	-0.0071	0.01	-0.0646	0.0178	0.1467	-0.0086	-0.002	-0.0029	0.0644	0.0521	0.0745	1		
MTB (13)	0.1017	0.1704	-0.0411	0.0152	-0.1452	-0.1137	-0.0072	-0.0056	0.0094	0.0144	-0.021	0.3709	1	
M_A (14)	0.0067	0	-0.0033	0.0002	0.0763	0.012	-0.0041	-0.0044	-0.0265	0.0088	0.0153	-0.0144	-0.0353	1

The sample consists of 6,349 firm-year observations over 2005-2018.

Panel A is the summary statistic for the whole sample including interim and annual data.

Panel B presents the univariate tests results between interim and annual earnings reliability measures. The first (second) column is interim (annual) summary statistics and the third column is the test statistics.

Panel C presents the Pearson correlation among variables

Table 3
Interim earnings reliability to annual earnings reliability

	(1)	(2)	(3)
	Abs(DA)	**DD**	**Smoothness**
INT	0.0074***	0.0331***	-0.2710***
	(5.64)	(30.44)	(-4.14)
Size	-0.0083***	-0.0066***	-0.0930***
	(-20.63)	(-20.06)	(-4.68)
ROA	-0.0008***	-0.0003***	-0.0154***
	(-14.13)	(-6.40)	(-5.63)
CFVOL/SVOL	0.0000	0.0000	-0.0000
	(0.81)	(0.34)	(-0.23)
BIG4	-0.0008	-0.0071***	-0.0628
	(-0.48)	(-5.48)	(-0.79)
Leverage	0.0010**	-0.0001	-0.0646***
	(2.08)	(-0.15)	(-2.92)
MTB	0.0023***	0.0022***	-0.0334***
	(11.96)	(13.84)	(-3.52)
M&A	0.0098***	0.0067**	0.0139
	(2.59)	(2.16)	(0.06)
BDIND	-0.0083*	-0.0067*	0.4657**
	(-1.76)	(-1.74)	(2.05)
BDFEM	-0.0037	0.0261***	-0.0485
	(-0.59)	(5.07)	(-0.17)
Cons	1.8421***	-0.1665	3.3925***
	(5.02)	(-0.55)	(10.04)
N	12698	12698	7346
Adjusted R^2	0.1251	0.1720	0.0169
Industry fixed effect	YES	YES	YES
Year fixed effect	YES	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, respectively.
This table shows test results on interim earnings reliability compared to annual earnings reliability. Column (1) presents the results on the discretionary accruals measure and Column (2) on the accrual errors volatility measure. The model is specified in equation (1) as below:

$$Abs(DA) or\ DD = \alpha_1 + \beta_1 INT + \beta_2 Size + \beta_3 ROA + \beta_4 CFVOL + \beta_5 BIG4 + \beta_6 Leverage + \beta_7 MTB + \beta_8 M\&A + \beta_9 BD + \beta_{10} BDFEM + \varepsilon$$

$$\text{smoothness} = \alpha_1 + \beta_1 INT + \beta_2 Size + \beta_3 ROA + \beta_4 SVOL + \beta_5 BIG4 + \beta_6 Leverage + \beta_7 MTB + \beta_8 M\&A + \beta_9 BDIND + \beta_{10} BDFEM + \varepsilon$$

Where:
Abs(DA) = the absolute value of discretionary accruals from Modified Jones model (Dechow, Sloan & Sweeny, 1995)
DD = the accrual errors volatility measure from the Dechow and Dichev (2002)

Smoothness = earnings smoothness measure as in equation (A.5)
Size = The natural log of the total asset of the firm-year observation
ROA = Earnings before interest / (total assets less outside equity interests)
CFVOL = Cash flow volatility proxied by the standard deviation of firm's operating cash flow divided by lagged total assets
SVOL = Sales volatility proxied by the standard deviation of firm's sales revenue divided by lagged total assets
BIG4 = Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise
Leverage = Total assets/shareholders' equity
MTB = Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity
M&A = Indicator variable coded as 1 for firm-year observations involved in M&A being either target or bidding firms
BDIND = The board independence of the firm-year proxied by the percentage of independent directors on board
BDFEM = The female representation on board proxied by the percentage of female directors on board

Table 4
Interim earnings persistence

	(1)
	$\boldsymbol{EBIT_{i,t+1}}$
$\boldsymbol{EBIT_{i,t}}$	0.6429***
	(65.13)
INT	0.0021
	(1.05)
$\boldsymbol{EBIT_{i,t} * INT}$	-0.0415***
	(-2.92)
Cons	0.0009
	(0.65)
N	12572
Adjusted $\boldsymbol{R^2}$	0.1799

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, respectively.
This table shows test results on the interim earnings persistence compared to annual earnings. The model is specified in equation (A.4): $EBIT_{i,t+1} = \beta_0 + \beta_1 EBIT_{i,t} + \beta_2 INT_{i,t} + \beta_3 EBIT_{i,t} * INT_{i,t} + \varepsilon$

Where:

$\boldsymbol{EBIT_{t+1}}$ = the annual (interim) earnings before interest and tax for firm *i* in fiscal year *t+1* for annual (interim) data divided by average total assets;

$\boldsymbol{EBIT_t}$ = the annual (interim) earnings before interest and tax for firm *i* in fiscal year *t* for annual (interim) data divided by average total assets;

$\boldsymbol{INT}$ = an indicator variable equals to 1 for interim earnings and 0 for annual earnings;

Table 5

Association between interim earnings indicativeness measure and earnings reliability measures

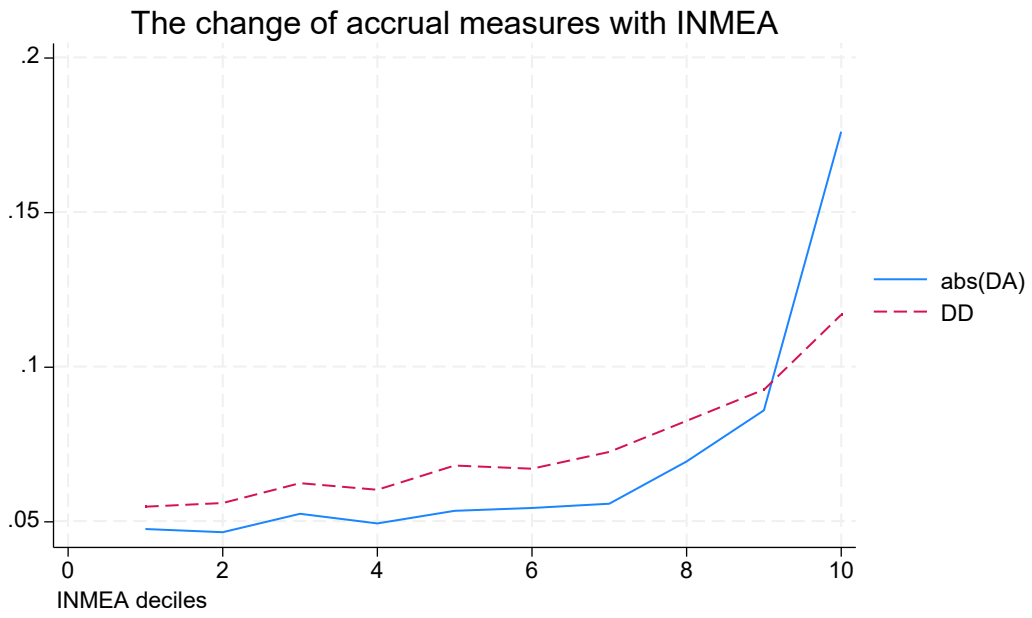
Panel A: Correlation between the interim earnings indicativeness measure and accruals measures

	Abs(DA)	DD	Smoothness
INMEA	0.3811	0.1487	0.0821
p-value	(0.0000)	(0.0000)	(0.0000)

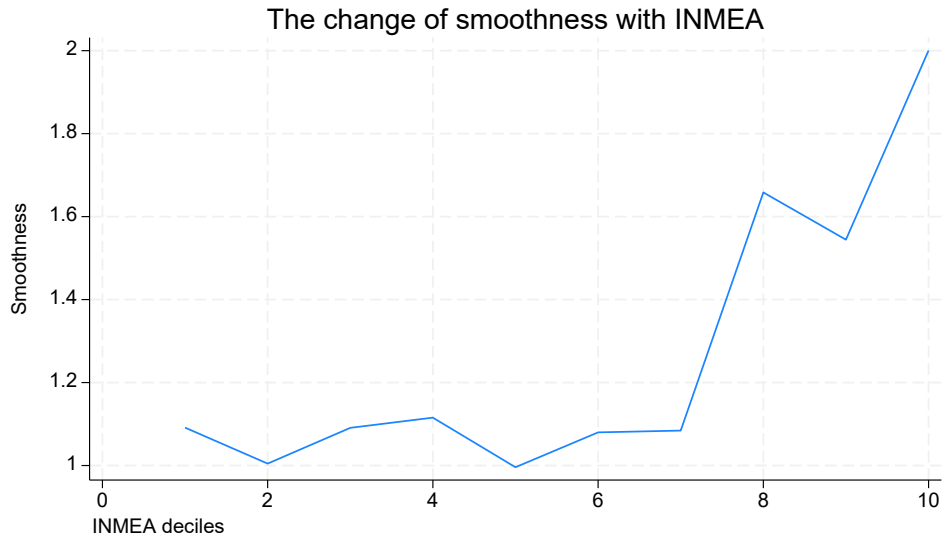
Panel B: Co-movement between interim earnings indicativeness measure and accruals measures

Portfolio	INMEA	Abs(DA)	DD	Smoothness
1	0.0042	0.0470	0.0554	1.0482
2	0.0138	0.0508	0.0613	1.1030
3	0.0264	0.0538	0.0676	1.0378
4	0.0477	0.0625	0.0775	1.3656
5	0.2128	0.1309	0.1048	1.7602

This tables shows the results on the association between interim indicativeness measure (INMEA) and other earnings reliability measures. Panel A displays the correlation between interim indicativeness measure and accruals measures. Panel B displays the change of accruals measures with the interim indicativeness groups. The sample is partitioned into five portfolios according to the value of interim indicativeness measure.



[Figure 1]



[Figure 2]

Table 6

Panel A: Interim earnings reliability and size effect (1)

	(1)	(2)	(3)	(4)	(5)	(6)
	DA_abs	**DA_abs**	**DD**	**DD**	**Smoothness**	**Smoothness**
	Large	**Small**	**Large**	**Small**	**Large**	**Small**
INT	0.0046***	0.0105***	0.0267***	0.0431***	-0.0603	-0.5385***
	(2.98)	(4.66)	(24.06)	(22.26)	(-0.62)	(-5.97)
Size	-0.0085***	-0.0117***	-0.0060***	-0.0101***	-0.1736***	0.0189
	(-15.10)	(-9.64)	(-14.69)	(-9.72)	(-4.58)	(0.42)
ROA	0.0001	-0.0008***	-0.0002*	-0.0002***	-0.0183**	-0.0196***
	(0.51)	(-11.02)	(-1.88)	(-2.58)	(-2.09)	(-6.73)
CFVOL	0.0000	0.0143***	-0.0000	0.0151***	-0.0000	-0.1677***
	(0.91)	(9.02)	(-0.17)	(11.13)	(-0.04)	(-4.42)
BIG4	-0.0028	0.0003	-0.0092***	-0.0062***	0.2057	-0.3449***
	(-1.44)	(0.12)	(-6.55)	(-2.92)	(1.58)	(-3.48)
Leverage	0.0017***	0.0012	-0.0019***	0.0020***	-0.1317***	-0.0059
	(3.06)	(1.50)	(-4.79)	(3.07)	(-3.74)	(-0.21)
MTB	0.0015***	0.0023***	0.0009***	0.0023***	-0.0153	-0.0377***
	(5.00)	(8.44)	(4.03)	(10.14)	(-0.76)	(-3.48)
M&A	0.0076**	0.0156*	0.0069***	0.0006	-0.4228*	1.5025***
	(2.20)	(1.73)	(2.73)	(0.07)	(-1.68)	(3.31)
BDIND	-0.0010	-0.0175**	-0.0026	-0.0134**	1.4919***	-0.1921
	(-0.17)	(-2.44)	(-0.61)	(-2.18)	(4.04)	(-0.68)
BDFEM	-0.0204**	0.0048	0.0046	0.0400***	-0.7777*	0.6077
	(-2.49)	(0.50)	(0.77)	(4.88)	(-1.68)	(1.63)
Cons	1.3282***	2.4573***	-0.6622**	0.6944	4.6411***	1.7310**
	(3.08)	(4.09)	(-2.11)	(1.35)	(6.42)	(2.26)

N	6495	6203	6495	6203	3673	3673
Adjusted R^2	0.0899	0.1167	0.1783	0.1667	0.0173	0.0305
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, respectively.
This table shows test results on the size effect of interim earnings reliability compared to annual earnings reliability. Column (1) presents the results on the discretionary accruals measure for large firms and Column (2) for small firms. Column (3) and (4) report results on the accrual errors volatility measure for large and small firms respectively. Column (5) and (6) report results on the earnings smoothness measure for large and small firms respectively. The model is specified in equation (1) as below:

$$Abs(DA) or\ DD = \alpha_1 + \beta_1 INT + \beta_2 Size + \beta_3 ROA + \beta_4 CFVOL + \beta_5 BIG4 + \beta_6 Leverage + \beta_7 MTB + \beta_8 M\&A + \beta_9 BDIND + \beta_{10} BDFEM + \varepsilon$$

$$\text{smoothness} = \alpha_1 + \beta_1 INT + \beta_2 Size + \beta_3 ROA + \beta_4 SVOL + \beta_5 BIG4 + \beta_6 Leverage + \beta_7 MTB + \beta_8 M\&A + \beta_9 BDIND + \beta_{10} BDFEM + \varepsilon$$

Where:
Abs(DA) = the absolute value of discretionary accruals from Modified Jones model (Dechow, Sloan & Sweeny, 1995)
DD = the accrual errors volatility measure from the Dechow and Dichev (2002)
Smoothness = earnings smoothness measure as in equation (A.5)
INT = Indicator variable coded as 1 for interim periods and 0 for annual periods
Size = The natural log of the total asset of the firm-year observation
ROA = Earnings before interest / (total assets less outside equity interests)
CFVOL = Cash flow volatility proxied by the standard deviation of firm's operating cash flow divided by lagged total assets
SVOL = Sales volatility proxied by the standard deviation of firm's sales revenue divided by lagged total assets
BIG4 = Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise
Leverage = Total assets/shareholders' equity
MTB = Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity
M&A = Indicator variable coded as 1 for firm-year observations involved in M&A being either target or bidding firms
BDIND = The board independence of the firm-year proxied by the percentage of independent directors on board
BDFEM = The female representation on board proxied by the percentage of female directors on board

Panel B: Interim earnings reliability and size effect (2)

	(1)	(2)
	$\boldsymbol{EBIT_{i,t+1}}$	$\boldsymbol{EBIT_{i,t+1}}$
	Large	**Small**
$\boldsymbol{EBIT_{i,t}}$	0.6146***	0.6058***
	(33.67)	(43.66)
INT	0.0004	0.0009
	(0.18)	(0.24)
$\boldsymbol{EBIT_{i,t} * INT}$	0.0178	-0.0526***
	(0.70)	(-2.62)
Cons	0.0182***	-0.0168***
	(13.37)	(-6.47)
N	6286	6286
Adjusted $\boldsymbol{R^2}$	0.2683	0.1476

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, respectively.
This table shows test results on the interim earnings persistence compared to annual earnings for large and small firms separately. Column (1) and (2) reports results for small and large firms respectively. The model is specified in equation (A.4): $EBIT_{i,t+1} = \beta_0 + \beta_1 EBIT_{i,t} + \beta_2 INT_{i,t} + \beta_3 EBIT_{i,t} * INT_{i,t} + \varepsilon$

Where:

$\boldsymbol{EBIT_{t+1}}$ = the annual (interim) earnings before interest and tax for firm *i* in fiscal year *t+1* for annual (interim) data divided by average total assets;

$\boldsymbol{EBIT_t}$ = the annual (interim) earnings before interest and tax for firm *i* in fiscal year *t* for annual (interim) data divided by average total assets;

$\boldsymbol{INT}$ = an indicator variable equals to 1 for interim earnings and 0 for annual earnings;

Panel C: test on the difference between the coefficient on the small and large subsample

	(1)	(2)
	Abs_DA	**DD**
p-value	0.0290**	0.0000***
Chi2	4.77	59.29

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.
This table shows test results on the statistical difference between the coefficient on INT ($\boldsymbol{\beta_1}$) for small and large subsamples. Column (1) presents the results on the comparsion between Column (1) and (2) in Panel A and Column (2) on the comparison between the column (3) and (4) in Panel A.

Table 7

Interim earnings reliability and survivorship bias

	(1)	(2)	(3)	(4)
	DA_abs	**DA_abs**	**DD**	**DD**
	Listed	**Delisted**	**Listed**	**Delisted**
INT	0.0082***	0.0057	0.0333***	0.0326***
	(5.71)	(1.64)	(29.12)	(9.79)
Size	-0.0071***	-0.0116***	-0.0060***	-0.0088***
	(-17.10)	(-9.64)	(-18.00)	(-7.71)
ROA	-0.0008***	-0.0008***	-0.0003***	-0.0006***
	(-13.36)	(-5.04)	(-6.81)	(-3.85)
CFVOL	0.0000	0.0124***	-0.0000	0.0031
	(0.60)	(5.84)	(-0.26)	(1.55)
BIG4	-0.0006	0.0024	-0.0089***	0.0000
	(-0.38)	(0.57)	(-6.64)	(0.01)
Leverage	-0.0000	0.0027**	-0.0006	0.0052***
	(-0.10)	(2.32)	(-1.41)	(4.65)
MTB	0.0021***	0.0028***	0.0017***	0.0031***
	(10.21)	(5.36)	(10.54)	(6.37)
M&A	0.0115***	0.0163**	0.0118***	-0.0007
	(2.64)	(2.03)	(3.41)	(-0.09)
BDIND	-0.0124**	-0.0122	-0.0040	-0.0121
	(-2.44)	(-1.02)	(-1.00)	(-1.07)
BDFEM	-0.0135**	-0.0057	0.0232***	0.0055
	(-2.09)	(-0.34)	(4.52)	(0.35)
Cons	0.1905***	0.2679***	0.1508***	0.1829***
	(27.02)	(13.09)	(26.91)	(9.44)
N	10640	2058	10640	2058
Adjusted R^2	0.1104	0.1238	0.1897	0.1386
Industry fixed effect	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, respectively.
This table shows test results on the interim earnings reliability compared to annual earnings reliability for listed subsample and delisted subsample. Column (1) presents the results on the discretionary accruals measure for listed subsample and Column (2) for delisted subsample. Column (3) and (4) reports results on the accrual errors volatility measure for listed and delisted subsample respectively. The model is specified in equation (1) as below:

$$Abs(DA) or\ DD = \alpha_1 + \beta_1 INT + \beta_2 Size + \beta_3 ROA + \beta_4 CFVOL + \beta_5 BIG4 + \beta_6 Leverage + \beta_7 MTB + \beta_8 M\&A + \beta_9 BDIND + \beta_{10} BDFEM + \varepsilon$$

Where:
Abs(DA) = the absolute value of discretionary accruals from Modified Jones model (Dechow, Sloan & Sweeny, 1995)
DD = the accrual errors volatility measure from the Dechow and Dichev (2002)
INT = Indicator variable coded as 1 for interim periods and 0 for annual periods
Size = The natural log of the total asset of the firm-year observation
ROA = Earnings before interest / (total assets less outside equity interests)
CFVOL = Cash flow volatility proxied by the standard deviation of firm's operating cash flow divided by lagged total assets
BIG4 = Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise
Leverage = Total assets/shareholders' equity
MTB = Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity
M&A = Indicator variable coded as 1 for firm-year observations involved in M&A being either target or bidding firms
BDIND = The board independence of the firm-year proxied by the percentage of independent directors on board
BDFEM = The female representation on board proxied by the percentage of female directors on board

Table 8

Interim earnings accruals and asset impairment

	(1)	(2)
	Abs_DA	**Impair_DA**
INT	0.0078***	0.0993***
	(5.94)	(47.40)
Impair	0.0000	-
	(0.46)	-
Size	-0.0079***	-0.0075***
	(-19.65)	(-11.76)
ROA	-0.0008***	-0.0005***
	(-14.31)	(-5.53)
CFVOL	0.0000	0.0000
	(0.82)	(1.27)
BIG4	0.0002	-0.0051**
	(0.14)	(-2.04)
Leverage	0.0012**	0.0023***
	(2.50)	(3.05)
MTB	0.0022***	0.0013***
	(11.25)	(4.32)
M&A	0.0095**	0.0250***
	(2.55)	(4.20)
BDIND	-0.0149***	-0.0191***
	(-3.19)	(-2.58)
BDFEM	-0.0069	-0.0173*
	(-1.10)	(-1.75)
Cons	0.2035***	0.1723***
	(26.68)	(14.37)
N	12294	12496
Industry fixed effect	YES	YES
Year fixed effect	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, respectively.
This table shows test results on the impact of the asset impairment on interim discretionary accrual. Column (1) presents the results when asset impairment is added to the control variables and Column (2) presents the results using interim earnings adjusted for asset impairment. The model is specified in equation (1).
Where:

$$\boldsymbol{Impair} = PPE_t + CAPEX - DEPN - PPEsales - PPE_{t+1}$$

INT = Indicator variable coded as 1 for interim periods and 0 for annual periods
Size = The natural log of the total asset of the firm-year observation
ROA = Earnings before interest / (total assets less outside equity interests)
CFVOL = Cash flow volatility proxied by the standard deviation of firm's operating cash flow divided by lagged total assets
BIG4 = Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise
Leverage = Total assets/shareholders' equity
MTB = Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity
M&A = Indicator variable coded as 1 for firm-year observations involved in M&A being either target or bidding firms
BDIND = The board independence of the firm-year proxied by the percentage of independent directors on board
BDFEM = The female representation on board proxied by the percentage of female directors on board

Table 9

Association with earnings predictability measures

	INMEA	Abs(DA)	DD
RMSE	0.2541	0.1945	0.3485
p-value	(0.0000)	(0.0000)	(0.0000)

This table shows the results on the association between earnings predictability measure, interim earnings indicativeness measure (INMEA) and accruals measures.

Table 10
Interim earnings accruals in one-stage model

	(1)	(2)	(3)
	Accruals	**Accruals**	**Accruals**
	Whole	**Large**	**Small**
INT	0.0121***	0.0038*	0.0401***
	(3.57)	(1.76)	(6.41)
MJ1	-0.0223***	-0.0207***	-0.1087***
	(-98.23)	(-204.73)	(-23.39)
MJ2	-0.0492***	-0.0625***	0.0745***
	(-26.04)	(-74.31)	(8.65)
Size	0.0020*	0.0035***	0.0024
	(1.95)	(4.57)	(0.73)
ROA	0.0031***	0.0022***	0.0035***
	(21.52)	(10.24)	(17.31)
SVOL	0.0000	-0.0000	0.0520***
	(0.14)	(-0.42)	(11.62)
BIG4	-0.0161***	-0.0082***	-0.0209***
	(-4.03)	(-3.07)	(-3.12)
Leverage	-0.0017	0.0002	-0.0013
	(-1.38)	(0.27)	(-0.63)
MTB	-0.0009*	-0.0002	-0.0010
	(-1.94)	(-0.44)	(-1.28)
M&A	-0.0030	0.0053	-0.0472*
	(-0.31)	(1.11)	(-1.88)
BDIND	-0.0052	-0.0002	-0.0035
	(-0.44)	(-0.03)	(-0.18)
BDFEM	-0.0037	-0.0631***	0.0496*
	(-0.23)	(-6.05)	(1.93)
Cons	-0.0453**	-0.0569***	-0.0846
	(-2.34)	(-3.94)	(-1.51)
N	12698	6349	6349
Adjusted R^2	0.1898	0.9999	0.1479
Industry fixed effect	YES	YES	YES
Year fixed effect	YES	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, respectively.

This table shows test results on the one-stage model for interim accruals compared to annual accruals. Column (1) presents the results for all firms. Column (2) and (3) reports results for small and large firms respectively. The model is specified as below:

$$\text{Accruals} = \alpha_1 + \beta_1 INT + \beta_2 MJ1 + \beta_3 MJ2 + \beta_4 Size + \beta_5 ROA + \beta_6 SVOL + \beta_7 BIG4 + \beta_8 Leverage + \beta_9 MTB + \beta_{10} M\&A + \beta_{11} BDIND + \beta_{12} BDFEM + \varepsilon$$

Where:

Accruals = the difference between net operating profit and operating cash flow

INT = Indicator variable coded as 1 for interim periods and 0 for annual periods

MJ1 = the difference between the change in revenue and the change in accounts receivable divided by beginning total assets

MJ2 = property, plant and equipment divided by beginning total assets

Size = The natural log of the total asset of the firm-year observation

ROA = Earnings before interest / (total assets less outside equity interests)

SVOL = Sales volatility proxied by the standard deviation of firm's sales revenue divided by lagged total assets

BIG4 = Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise

Leverage = Total assets/shareholders' equity

MTB = Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity

M&A = Indicator variable coded as 1 for firm-year observations involved in M&A being either target or bidding firms

BDIND = The board independence of the firm-year proxied by the percentage of independent directors on board

BDFEM = The female representation on board proxied by the percentage of female directors on board

Table 11

Interim earnings reliability and sensitivity to the inclusion of mining firms

	(1)	(2)	(3)	(4)
	Abs(DA)	**Abs(DA)**	**DD**	**DD**
	Non-materials	**Materials**	**Non-materials**	**Materials**
INT	0.0106***	0.0078***	0.0353***	0.0329***
	(7.00)	(2.68)	(28.07)	(14.43)
size	-0.0074***	-0.0069***	-0.0054***	-0.0066***
	(-16.12)	(-8.67)	(-14.00)	(-10.56)
ROA	-0.0009***	-0.0006***	-0.0006***	0.0000
	(-13.12)	(-5.92)	(-9.58)	(0.08)
SVOL	-0.0012***	0.0173***	-0.0012***	0.0072
	(-11.09)	(3.07)	(-12.93)	(1.63)
CFVOL	0.0156***	0.0320***	0.0152***	0.0113**
	(11.10)	(5.18)	(12.93)	(2.34)
BIG4	0.0001	0.0011	-0.0109***	0.0030
	(0.08)	(0.34)	(-7.32)	(1.19)
leverage	0.0009*	-0.0012	0.0005	0.0005
	(1.76)	(-1.04)	(1.15)	(0.51)
MTB	0.0016***	0.0044***	0.0021***	0.0003
	(7.70)	(9.09)	(12.05)	(0.68)
M_A	0.0199***	-0.0006	0.0081**	0.0076
	(4.29)	(-0.09)	(2.10)	(1.48)
BDIND	-0.0068	-0.0329***	-0.0101**	-0.0040
	(-1.26)	(-3.58)	(-2.23)	(-0.55)
BDFEM	-0.0042	-0.0320**	0.0164***	0.0440***
	(-0.62)	(-2.37)	(2.92)	(4.16)
Cons	0.1892***	0.1839***	0.1359***	0.1534***
	(24.35)	(13.30)	(20.99)	(14.15)
N	9836	2862	9836	2862
Adjusted R^2	0.1280	0.1396	0.1935	0.1181
Industry fixed effect	YES	YES	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, respectively.
This table shows test results on the interim earnings reliability compared to annual earnings reliability for the subsample excluding material sector and for the materials sector only. Column (1) presents the results on the discretionary accruals measure for the non-materials subsample and Column (2) for the material subsample. Column (3) and (4) reports results on the accrual errors volatility measure for the non-materials and materials subsample respectively. The model is specified in equation (1) as below:

$$Abs(DA) or\ DD = \alpha_1 + \beta_1 INT + \beta_2 Size + \beta_3 ROA + \beta_4 CFVOL + \beta_5 BIG4 + \beta_6 Leverage + \beta_7 MTB + \beta_8 M\&A + \beta_9 BDIND + \beta_{10} BDFEM + \varepsilon$$

Where:
Abs(DA) = the absolute value of discretionary accruals from Modified Jones model (Dechow, Sloan & Sweeny, 1995)
DD = the accrual errors volatility measure from the Dechow and Dichev (2002)
INT = Indicator variable coded as 1 for interim periods and 0 for annual periods
Size = The natural log of the total asset of the firm-year observation
ROA = Earnings before interest / (total assets less outside equity interests)
CFVOL = Cash flow volatility proxied by the standard deviation of firm's operating cash flow divided by lagged total assets
BIG4 = Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise
Leverage = Total assets/shareholders' equity
MTB = Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity
M&A = Indicator variable coded as 1 for firm-year observations involved in M&A being either target or bidding firms
BDIND = The board independence of the firm-year proxied by the percentage of independent directors on board
BDFEM = The female representation on board proxied by the percentage of female directors on board

Chapter 4

Interim reporting quality and audit committee characteristics

4.1 Introduction

In the previous chapter, I showed that interim earnings is of lower quality than annual earnings, and that its ability to indicate the annual earnings of the year is correlated with its quality. In this chapter, I examine whether audit committee characteristics are associated with interim earnings quality. Previous studies have linked corporate governance attributes to annual earnings quality (Bedard, Chtourou, & Courteau, 2004a; Pucheta-Martínez, Bel-Oms, & Olcina-Sempere, 2018; Xie, Davidson, & Dadalt, 2003b). The results from studies of annual earnings may not apply to interim earnings because of the difference in interim and annual reporting processes of which the differential earnings quality is a result.

Corporate governance is intended to promote investor confidence through establishing accountability and enhancing internal control (Farrar & Hanrahan, 2017). Hence, the link between corporate governance quality and earnings quality is of particular interest to researchers because earnings are the primary source of information to assist investors' decision-making (Magena et al., 2008; Taylor & Tong, 2023). Perceived earnings quality is pivotal to the speed and level of investor reaction, and investors rely on observable assurance mechanisms of earnings quality rather than earnings quality itself, which is not directly observable (Francis, Lafond, Olsson, & Schipper, 2007; Shin & Kim, 2018). There are both external and internal assurance mechanisms on earnings quality. External assurance is provided by the external assurance from audit and regulatory oversight and internal assurance is provided by corporate governance. With a reduced level of assurance from auditors and regulatory bodies on interim earnings, the oversight provided by corporate governance is arguably more important (Kanagaretnam, Lobo, & Whalen, 2007).

In this chapter, I focus on audit committee characteristics because the audit committee exercises direct oversight of the reporting process and the choice of auditor, both of which are closely related to financial reporting quality. One of the primary responsibilities of the audit committee is to safeguard financial reporting quality as the audit committee is the sub-committee delegated to oversee the preparation and the presentation of the financial reports (IAASB, 2012). Despite the observable differences between the interim and annual reports, notably the level of oversight and the period covered, interim and annual reports are both the responsibility of the audit committee. Therefore, the natural question is whether there is an association between the audit committee's characteristics and interim earnings quality? And, if there is, is the level of this association different from its counterpart with annual earnings quality?

Following prior research on annual earnings quality, in this chapter I examine the following characteristics of the audit committee: independence, accounting expertise and female representation. According to various corporate governance theories, including agency theory, stewardship theory and resource dependence theory, these characteristics are related to earnings quality. Each characteristic can have a different expected impact on earnings quality depending on the theoretical lenses used. Therefore, these corporate governance theories are discussed in the hypothesis development.

Audit committee independence refers to the degree to which the audit committee members are independent from the firm and its management. This characteristic is considered desirable from an agency theory perspective, because directors need to monitor management objectively on behalf of shareholders. Relying on this, the dominant theory in the corporate governance literature, many studies have found audit committee independence to be positively related to annual earnings quality (e.g. Bedard et al. (2004b). However, stewardship theory and universal ownership theory also explain the relationship between managers and stakeholders, and do not

indicate a need for monitoring of management by an independent audit committee. Stewardship theory posits that managers are trustworthy, so they do not need independent monitoring, and universal ownership theory emphasises the benefits from the interventions of major shareholders.

Under another theory, audit committee accounting expertise is desirable. Resource dependency theory attributes the value of the directors to their resources and expertise. Audit committee members equipped with accounting expertise are seen to be better able to judge and advise on the appropriateness of the reporting process. In contrast, excessive expertise might lead to free-rider problems if other corporate governance mechanisms are undermined because of an overreliance on audit committee expertise.

Similar to resource dependence, human capital theory values the benefits derived from certain characteristics of the directors. Prior studies associate female representation on the audit committee with annual earnings quality because female directors are documented to exhibit certain characteristics like being more risk-averse and conscientious, which restrain earnings manipulation (Belaounia, Tao, & Zhao, 2020). However, there would be no association if female representation on the audit committee is a result of tokenism.

In addition to the theoretical explanations that suggest no association between audit committee characteristics and earnings quality, a lack of director involvement in the interim reporting process would be reflected in an insignificant or weaker association. Note that audit committees comprise mainly non-executive directors following *ASX Corporate Governance Principles and Recommendations*, which means that being a director is not their full-time job and they meet at most monthly over the reporting year. The limited time and attention of the directors are more likely to be devoted to annual reporting due to the perceived lower importance of the interim report. After thorough analysis in this chapter, no consistent association is found

between the chosen audit committee attributes and either interim or annual earnings quality. Possible explanations for this conclusion are that the effectiveness of the audit committee for earnings quality is homogeneous in Australia, or the audit committee does not fulfil its responsibilities in relation to the interim report.

This chapter makes several contributions. First, it links the audit committee characteristics with interim earnings quality. The intention is not to accuse the audit committee of inadequately discharging its duties but to explore the potential for enhancing interim reporting through increased awareness of internal governance. Therefore, one avenue to improve interim reporting quality could involve enhancing the effectiveness of audit committees by encouraging directors to recognize the value of interim reporting. This chapter also contributes to the literature on audit committees and corporate governance. It expands our knowledge of the relation between corporate governance attributes and earnings quality to interim earnings quality. Previous literature on interim reporting primarily focuses on the associations between corporate governance attributes and interim reporting behaviour such as the level of interim disclosures (Mangena and Pike, 2005), engaging an external review (Mangena & Tauringana, 2008), and the communication of the interim report (Chen, Carson, & Simnett, 2007). This research extends the link from interim reporting behaviour to interim earnings quality. This chapter also contributes to the interim reporting literature by clarifying a potential determinant of earnings quality. Unlike external determinants such as assurance level (Casey, Kaplan, & Pinello, 2015; Kajuter, Klassmann, &Nienhaus, 2016), the impact of internal governance on interim earnings quality is less than might be expected.

The remainder of this chapter is as follows. Section 2 presents a review of the literature and develops the hypotheses to be tested; Section 3 illustrates the research design and presents a detailed description of the sample selection process; the empirical results are discussed in Section 4 and Section 5 tests for robustness; Section 6 considers the limitations and concludes.

4.2 Literature Review and Hypothesis Development

4.2.1 Corporate Governance

Corporate governance has been broadly defined as "the system by which companies are directed and controlled" (Cadbury Report 2002: 15). This encompasses the environment surrounding corporations and the systems within corporations. The external mechanisms of corporate governance comprise all factors shaping corporate behaviour including laws, accounting rules and other regulatory requirements within the institutional setting. Auditors, investment bankers and analysts are also part of the system that externally disciplines and monitors corporate behaviour. More broadly corporate governance also includes the product market, executive labour market and the market for corporate control (Chew & Gillian, 2009).

The research on external mechanisms focuses more on underlying determinants like regulation, legislation and culture (Tricker, 2020). While being fundamental to corporate governance quality, external mechanisms are largely homogeneous within a jurisdiction like Australia. External mechanisms occasionally vary from one industry to another when there is a special treatment or additional regulations (for example, banking and mining), but the regulation, law and the stringency of external oversight are similar for all businesses within a jurisdiction.

This research focuses on internal governance, which can be conceptualized as "a set of arrangements that define the relationship between managers and shareholders as well as the system of accountability of the company, particularly related to the self-regulation system or capital/financial markets" (Iskander, 2002). The internal corporate governance mechanisms comprise multiple facets of a corporation. Prior research has distilled the numerous individual measures of internal governance into categories. For example, Larcker, Richardson & Tuna (2007) summarize prior studies and reduce 39 individual governance indicators into five main categories: board variables, ownership variables, activist variables, debt variables and anti-takeover variables. The corporate governance index in Aggarwal, Erel, Ferreira, and Matos

(2011) combines 41 governance attributes into four categories: board characteristics, audit, anti-takeover provisions, and compensation and ownership.

Although the development of corporate governance is a global occurrence, it is influenced by local legal, cultural and structural differences (Mallin, 2019). This research is undertaken in Australia, which is a similar context to the U.S. in that Australia has a common law system (as opposed to a civil law system), democratic institutions, relatively efficient capital markets, a competitive banking system, established accounting bodies and different but similar accounting standards (IFRS versus GAAP).

Despite the similarities, the institutional environment and corporate governance practice in Australia are also different from the U.S. in various aspects. America has a relatively strong regulatory system and investor protection which could deter earnings manipulation to some extent and lessen the effect of internal governance (Lee, Lim, & Zhang, 2016). The lower litigation-risk and more flexible corporate governance rules make Australia a strong environment in which to test the effect of the internal corporate governance (Monem, 2013). The *Australian Corporate Governance Principles and Recommendations* developed by the ASX Corporate Governance Council adopts the "comply-or-explain" ("if not, why not") approach wherein non-compliance needs to be identified and explained (Beekes & Brown, 2006). In contrast, the U.S. Sarbanes-Oxley Act of 2002 (SOX) is a federal law that binds all public company boards, management and public accounting firms so that corporate governance practices need to be similar across firms as they are restricted by the law. The effect of better and worse corporate governance on earnings quality is more likely to be identified in Australia where there is greater variance in reporting practices compared to in the U.S.

In terms of internal governance, Monem (2013) finds higher ownership concentration and board independence in Australian firms compared to U.S. firms, and the ownership concentration in Australia seems to be an alternative governance mechanism. This is consistent

with the proposition from universal ownership theory that large shareholders intervene and monitor management to restrain their managerial discretion. Furthermore, the monitoring role of the board is more prominent in Australia than the U.S. where the board's advising role is valued as well (Hodne, Murphy, Ottenbacher & Ruggles, 2013). This difference can be inferred from U.S. practice whereby CEOs with satisfactory performance are regularly rewarded with a board chair position (CEO duality), while the two roles are usually kept separate in Australia. Since earnings quality is more closely related to monitoring than advising, the different Australian context permits insight into different aspects of corporate governance compared to many of the prior U.S. studies.

4.2.2 The Role of the Audit Committee

Although ultimate responsibility for a listed entity's financial statements rests with the board (ASX Corporate Governance Principles and Recommendations, 2019), the audit committee is delegated the responsibility of applying the details and as such it is able to directly influence the quality of financial reporting. The audit committee is a sub-committee that oversees the accounting and financial reporting processes (Recommendation 4.1) to ensure their input to the financial report is complete, timely and accurate. Audit committees are also responsible for the appointment, compensation and oversight of external/independent auditors who examine and provide assurance on whether the financial reports are faithfully presented and follow the relevant accounting standards. This responsibility involves ensuring the financial reports are subject to an appropriate, but not excessive level of scrutiny both internally and externally (Braiotta, 2010). The two primary responsibilities of the audit committee are both directed to financial reporting quality.

The principles and recommendations of the ASX influence the important characteristics of the audit committee, covering size, independence, expertise, activity and gender diversity. Specifically, a committee of more than three members is recommended, with all directors being

non-executive and the majority being independent. The relevant qualifications and experience of the members and the number of meetings held in the reporting period are recommended to be disclosed. These are the characteristics considered to be fundamental to the proper and efficient implementation of an audit committee's duties. Committee size ensures they have sufficient resources, and meeting frequency requires them to be diligent in fulfilling the duties. While the Australian Corporate Governance Principles and Recommendations was updated in the sample period (2005-2018 inclusive), the principles related to the characteristics examined in this chapter – independence, expertise and gender diversity – have remained (essentially) the same.

The independence of audit committee members is emphasised because they are supposed to bring objectivity to overseeing the financial reporting process and to avoid collusion with management. The relevant expertise of audit committee members is important for them to understand business procedures and therefore able to assess and advise on the appropriateness of the accounting treatments, especially with increasingly complicated transactions. It is also recommended that firms should strive for gender diversity in the composition of their boards and its committees.

4.2.2.1 Audit Committee Independence

While the introduction of corporate governance practices and regulations and subsequent changes to them have been prompted by corporate failures in the past, researchers explain their purposes in terms of various theories. Corporate governance theories are drawn from various academic fields like management, economics, sociology and psychology. Agency theory is the most widely used in corporate governance research. It emphasises the tension between the principal (shareholders) and the agency (executive managers). Managers are perceived to be rational and self-interested individuals who have incentives to seek personal benefits at the cost of shareholders (Jensen & Meckling, 1976). The separation of ownership and control in the

firm leaves the utility-maximising agents (executive managers) with residual rights and the resultant information asymmetry (Klettner, 2017) induces monitoring and bonding costs.

Under agency theory, the monitoring role of corporate governance is emphasised, which is to restrain the self-interested and utility-maximising managerial behaviour. A series of corporate scandals at the beginning of the century (e.g. Enron) demonstrate the opportunistic managerial behaviour described in agency theory. The collapse of Enron and other firms led to more stringent corporate governance regulations worldwide, including in Australia. Agency theory underpins Australian corporate governance regulation as explicated in the CLERP 9 [10] Explanatory Memorandum: "under Australia's corporate regulatory framework, directors and senior employees exercise control over company resources on behalf of shareholders, who have no direct operational control over the company. While this relationship is the most efficient approach to operating a company that is broadly owned, a recognised limitation is that it can give rise to a principal-agent problem" (2003, para. 4.347).

Agency theory explains managerial behaviour to some extent, but the impact of the managers' reputation in the executive labour market and the settling-up on their decision-making is not incorporated. In discussing prior research and developing hypotheses in the following paragraphs, alternative theories of corporate governance are introduced.

Independence is a fundamental attribute in agency theory. Directors with minimal personal incentives are expected to be able to exercise the monitoring function more efficiently. There are various measures of independence in corporate governance (Joseph, Ocasio, & McDonnell, 2014) including the presence of outside directors on the board (Jensen, 1993), the independence of the audit committee (Coates, 2007) and the separation of the CEO and board chair (Boyd, 1995). The level of independence is found to be negatively associated with the level of earnings

[10] Corporate Law Economic Reform Program (Audit Reform and Corporate Disclosure) Bill 2003

manipulation in Dechow, Sloan, and Sweeney (1996) when independence is measured as management capture (less board independence), the absence of an audit committee and CEO duality. Furthermore, board independence is found to be positively related to corporate social performance (Álvarez & Zubeltzu, 2017), which is consistent with stakeholder and enlightened shareholder theories which recognise that outside directors represent stakeholders' interest.

In contrast, independence is not a necessary attribute under stewardship theory which presumes managers are diligent and responsible (Davis, Schoorman, & Donaldson, 1997). Involving independent directors might have a negative impact on the operations of the board because they have insufficient knowledge of the business to make optimal decisions. Stewardship theory posits that the autonomy and responsibility of the managers motivates them to put the long-term welfare of the group above personal self-serving opportunistic incentives (Hernandez, 2012). The spirit of stewardship theory is implied in the delegation of power to the executives under company law. The protection provided to managers by the Corporations Act also demonstrates the trust in them. The business judgement rule allows the directors to defend against claims if they are acting in good faith. Stewardship theory is criticised as being naïve but it cannot be completely invalidated because the moral obligation of managers cannot be denied. The role of independence is also questioned in the universal ownership theory in which large shareholders who are not independent are seen as the key in guarding against managerial self-interested behaviour.

There is mixed academic evidence on the association between audit committee independence and annual earnings quality. Klein (2002) finds a positive association when independence is defined as the majority (50%) of audit members being independent but not when it is defined as full audit committee independence (100%). Bedard et al. (2004a), In contrast, find an association only with full independence (100%). Similarly, factors reducing audit committee independence like stock-based compensation and ownership have been found to impair

earnings quality in some studies, for example, Magilke, Mayhew, and Pike (2009), but other studies do not find any association (Ghosh, Marra, & Moon, 2010; Xie, Davidson, & Dadalt, 2003a) either before or after the implementation of SOX.

Davidson, Goodwin-Stewart, and Kent (2005), Koh, Laplante, and Tong (2007) and Abu, Monir, Ron, and Md Khokan (2020) document significant results in Australia, finding that audit committee independence mitigates earnings management. However, Baxter and Cotter (2009) do not find any association for Australian companies. The divergences may be a result of differences in institutional setting, sample period and sample characteristics.

In contrast with the prolific volume of research on annual earnings quality and audit committee independence, there is little evidence on an association with interim reporting quality. Yang and Krishnan (2005) is the only known research that examines directly the relation between quarterly earnings quality and audit committee independence and no association is found. In this chapter, I investigate the question in an Australian context because the differences between the U.S. and Australia, such as their corporate governance rules, business characteristics and corporate governance practices, may provide a setting which helps to resolve conflicting findings in the prior literature. I explore the association between audit committee independence and interim earnings quality in the period since the application of *AASB 134: Interim Financial Reporting,* from 2005 to 2018.

The audit committee has oversight responsibility for the accounting and the financial reporting processes of the company (Braiotta, 2010). Ensuring the integrity and the quality of the interim report is within its responsibility as interim reporting is one of the foremost channels to communicate and confirm the business's performance and financial position. According to agency theory, audit committee independence could improve interim reporting quality by restraining opportunistic reporting behaviour. However, if the audit committee considers

interim reporting to be of little importance and does not spend time and effort examining it, there would be no association.

Stewardship theory and universal ownership theory do not predict a positive association, as discussed already. The former postulates that independent directors do not understand the business well enough to make the most appropriate recommendations, and the latter emphasises major shareholders' rather than independent directors' capacity and incentives for changing corporation behaviour. Conversely, the audit committee is exclusively involved with monitoring, but in Australia (unlike much of Europe, for example) members of the audit committee are full board members and also participate in strategy. Given the competing theories the hypothesis is stated in the null form of no association:

H3a: There is no association between audit committee independence and interim reporting quality.

4.2.2.2 Audit committee expertise

Resource dependence theory is also relevant for corporate governance research. Non-executive directors are seen as providing the business with access to valuable resources (Nicholson & Kiel, 2007), including information, networks and relevant expertise. Hence, the advisory role of the board is the focus in resource dependency theory. The importance of resource dependence is demonstrated in the regulations. U.S. corporate governance rules s.407– dictate that at least one member of the audit committee should be equipped with financial expertise. The ASX Corporate Governance Principles and Recommendations also encourage companies to disclose the relevant qualifications and experience of audit committee members.

Accounting expertise is necessary for audit committee members to understand the reporting process and to detect possible earnings management. There is evidence of a positive association between accounting expertise (narrowly defined) and earnings quality (Kusnadi, Leong,

Suwardy, & Wang, 2014; Puat Nelson & Devi, 2013). The narrow definition of accounting expertise is also related to agency theory if the expertise is necessary to monitor the accounting and reporting processes efficiently.

There is an extensive literature on audit committee expertise and annual earnings quality. Bedard et al. (2004a) and Xie et al. (2003a) suggest that financial expertise is significantly related to annual earnings quality in the U.S., while the results in Ghosh et al. (2010) and Abu et al. (2020) do not support the argument. Ben Amar (2014) further contends financial expertise alone is insufficient, because audit committee members with expertise also need to remain independent to exert an influence on earnings quality. In Australian studies, Baxter and Cotter (2009) and Lary and Taylor (2012) document a positive association between the accounting expertise of the audit committee and annual earnings quality.

Most research on interim reports and audit committee expertise examines other aspects of interim reporting rather than the interim earnings result itself, for example, the level of disclosure (Mangena and Pike, 2005) and the decision to engage an external review voluntarily (Mangena & Tauringana, 2008). Yang and Krishnan (2005) examine interim earnings quality and no relation is found. One reason for finding no relation would be if the audit committee is not engaged in the interim reporting process. If exercised properly, accounting expertise might contribute to reviewing the appropriateness of accounting judgements and advising on the accounting treatments. This is especially relevant for the interim report in which a high level of estimation is required due to the lack of accurate information. If the audit committee devotes time and effort to examining the interim report, its experts could advise on estimations and predictions to improve the report's accuracy. However, accounting expertise would bear no association with interim earnings quality if the directors are not involved in the interim reporting process. Finally, for interim reports, estimated closing balance inaccuracies are likely to have double the impact (for half-yearly reports) on profit and loss items as the revenue or

expense will be about half the full-year's figure.[11] Both a positive association and no association are possible, therefore the hypothesis is stated in the null form:

H3b: There is no association between audit committee expertise and interim earnings quality.

2.2.3 Audit Committee Female Representation

Similar to resource dependency theory, human capital theory underscores the stock of knowledge, skills and resources of individual directors and the benefits brought by them (Pfeffer & Salancik, 2003). Accordingly, female representation is arguably a desirable attribute because female directors provide different sets of skills and experiences to male directors (Hillman, Cannella, & Paetzhold, 2000). For example, they are said to have greater accountability and diligence (Adams & Ferreira, 2009); better communication skills (Joy 2008); and better creative-thinking ability (Huse, Nielsen, & Hagen, 2009). They also put more emphasis on social responsibility and external legitimacy (Hafsi and Turgut, 2013; Bilimoria, 2006). Hence, the presence of female directors is expected to improve earnings quality by restraining earnings management because women directors have a more risk-averse attitude and a more ethical stance (Belaounia, Tao, & Zhao, 2020) than male directors.

Consistent with these arguments, Srinidhi, Gul, and Tsui (2011) and Zalata, Ntim, Choudhry, Hassanein, and Elzahar (2019) document a positive relation between female presence on boards and annual earnings quality. Furthermore, Thiruvadi and Huang (2011) provide evidence that the presence of female directors on the audit committee constrains the manager's earnings management by increasing income-decreasing discretionary accruals. A similar study set in a European context suggests that this effect is only significant if female directors are equipped with relevant expertise (Gull, Nekhili, Nagati, & Chtioui, 2018).

[11] A $10 understatement of a $100 expense in a half-year Statement of Comprehensive Income will reduce the expense by 10% while the same $10 understatement in the annual Statement, where the expense is likely double would be a 5% reduction ($10 / $200).

However, there are arguments against an association between audit committee female representation and interim earnings quality. Although female directors are found to be more diligent with greater attendance at board/committee meetings (Adams and Ferreira, 2009), fewer meetings might be held for interim reporting compared to annual reporting. Thus, female directors may not have sufficient knowledge of the interim reporting process and may have less chance to intervene. Another argument that suggests no association is that female directors behave similarly in an organizational context to their male counterparts because the generalised female attributes mentioned above may not apply to females in business leadership roles (García Lara, 2017). Sun, Liu, and Lan (2011) could not find an association between female representation and earnings quality in fully-independent audit committees. Tokenism also refutes any association because the appointment of female directors for legitimacy reasons – the appearance of equality – does not grant female directors the power and status necessary to exert influence on the outcome (Vial, 2016). Belaounia (2020) notices that the positive effect of the presence of a female director is contingent on the level of gender equality in the environment. Therefore, I hypothesise that:

H3c: There is no association between audit committee female representation and interim earnings quality.

4.2.2.3 Comparative Association with Interim and Annual Earnings Quality

If an association between audit committee characteristics and interim earnings quality exists, it might be different from that of annual earnings quality. The strength of the association may be greater for interim earnings if the greater variance in interim reporting quality emphasises the importance of internal governance. Compared to an annual report that is guarded by both internal corporate governance and external audit processes, external regulation and examination is less rigorous for the interim report. There is still an incentive to manipulate interim earnings as a result of market pressure (Bartov et al., 2002) and the results from the

previous chapter lend support to this argument. With the absence/leniency of external restraints, the effect of internal corporate governance could be more pronounced if it exists at all. In other words, the annual earnings quality among companies is more consistent than for interim earnings quality because all companies need to follow regulations and be audited. Interim earnings quality can be more variable because the quality can be much lower for "bad firms". If the audit committee does exert an influence on interim reporting quality, the effect can be stronger than for the annual counterparts. Also, audit committee expertise might be of more use for the interim report in which high levels of estimation and professional judgement are required. Relevant expertise is essential for advising on the accuracy of estimation and the appropriateness of judgement.

However, the asserted difference would not exist if audit committees do not examine or monitor the quality of interim report as discussed in H4. Thus, the hypothesis is stated in the null form:

H4: The level of association between audit committee characteristics and interim reporting quality is not different from the annual counterpart.

4.3 Research Design

4.3.1 Variables Definitions

4.3.1.1 Corporate Governance Measures

The corporate governance attributes examined in this study are independence, accounting expertise and female representation on the audit committee. There is a continuing debate on the scope of accounting expertise. The narrowest definition of expert only includes members who are Certified Public Accountants, Chartered Financial Analysts or have work experience in financial or accounting positions (Krishnan, 2005). The SEC expanded this definition of financial experts in 2003 due to the concern that a narrow definition limits the pool of the committee member candidates. According to SEC (2003b), finance experts are "individuals

with experience creating, auditing, using or overseeing the creation of financial reports". The accounting expertise measured in this research includes experience working as a certified public accountant, chief financial officer, vice president of finance, financial controller, or any other major accounting position (Defond, Hann, & Hu, 2005; Dhaliwal et al., 2010). The level of expertise is usually measured by three indicators: the number of financial experts, the percentage of committee members possessing expertise and a dummy variable that indicates the existence of financial expertise. Following prior research, I measure it as an indicator variable (ACExp) which is scored 1 if at least one member of the audit committee is classified as an accounting financial expert, 0 otherwise (Ashraf et al., 2020; Dhaliwal et al., 2010; Sultana, 2015).

Independence can be measured by either a dichotomous measure or by the percentage of independent directors on the audit committee (Larcker, Richardson, and Tuna, 2007). Independent directors are directors that are neither employed by the company nor related to the company. However, independence is not a precisely defined concept. For instance, directors with no business interests involved could be susceptible to the influence of management and directors who hold some shares do not necessarily have impaired objectivity. Here I follow the independence status determined by Connect4 Boardroom in which an independent director is classified as a non-executive director who is not a member of management, and who is free of any business or other relationship that could materially interfere with, or could reasonably be perceived to interfere with, the independent exercise of their judgement. Following Bedard et al. (2004) and Xie et al. (2003), this chapter uses a dichotomous measure to indicate audit committee independence given a large proportion of the sample is 100% independent. The 100% threshold is adopted in the main tests to capture the effect of full independence. An indicator variable (ACInd) is scored 1 if 100% of the members of the audit committee are independent, 0 otherwise. Alternative tests employ different measures.

Similarly, female representation on the audit committee can be measured by an indicator variable or by the percentage of female members on the audit committee. Given that the percentage of female directors on the audit committee for a large proportion of the sample is equal or close to 0, an indicator variable (ACFem) is scored 1 if at least one member of the audit committee is female, 0 otherwise following the director information in Connect4. (Adams & Ferreira, 2009; Srinidhi et al., 2011).

4.3.1.2 Earnings quality measures

Earnings quality is measured as the residual from the Dechow 1995 discretionary accrual model (Dechow, Sloan, & Sweeny, 1995). The discretionary accruals model for firm *i* in period *t* (fiscal year and half-year) is estimated using the regression in Equation (1) by GICS industry sectors and fiscal year. The level of earnings management is positively related to the magnitude of the discretionary accrual error term. The signed discretionary accruals measured in this chapter follow prior literature, because corporate governance studies primarily focus on income-increasing earnings manipulation, particularly under agency theory where managers may have incentives to increase income for personal benefit (Bedard et al., 2004b; Gull et al., 2018).

$$\frac{TACC_{ijt}}{TA_{ijt-1}} = \alpha_1 \left(\frac{1}{TA_{ijt-1}}\right) + \beta_{1,j} \left[\frac{(\Delta REV_{ijt} - \Delta AR_{ijt})}{TA_{ijt-1}}\right] + \beta_{2,j} \frac{PPE_{ijt}}{ASSETS_{ijt-1}} + \varepsilon_{ijt} \qquad (1)$$

Where:

$TACC_{ijt}$ = total accruals of company i from industry j in year t defined as earnings before extraordinary items and discontinued operations less operating cash flows;

TA = total assets;

ΔREV = revenues for period t less revenues for period t-1. The changes in revenue for annual data is the difference from revenue for the last fiscal year. For interim data, it is the difference of the half-year revenue in fiscal year t to the half-year revenue in fiscal year t-1;

ΔAR = change in accounts receivable for period t; and

PPE = gross property, plant and equipment.

3.2 Main Tests

In testing for H3a, H3b, H3c, the interim earnings quality measures are the dependent variables and the audit committee characteristics defined above are the independent variables: audit committee independence, accounting expertise and female representation specifically. The hypotheses will be rejected if the coefficients of the corresponding variables of audit committee characteristics are significant. On the contrary, the hypotheses cannot be rejected if the corresponding coefficients are not significant, suggesting that the quality of the audit committee is not associated with interim earnings quality.

$$\text{DA} = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon \quad (3)$$

Three types of control variables are included in the multivariate tests: governance, firm/auditor characteristics, and industry and year fixed effects. Governance control variables are audit committee size, audit committee tenure, board independence, female representation, board size, and institutional ownership. Audit committee size (ACsize), is the number of directors on the audit committee. A large audit committee could be more effective as a result of having more resources and broader experience (Zalata et al., 2019). Alternatively, it could be less effective as a result of process losses and diffusion of responsibility (Karamanou & Vafeas, 2005). Audit

committee tenure ($ACtenure$) is the average number of years the audit committee members for firm i have been on the audit committee as of year t (Vafeas, 2005). Board independence (BDInd) is the percentage of independent directors on the board. Klein (2002) indicates that a greater proportion of independent directors on the board reduces the level of earnings management. Female representation on the board, measured as the percentage of female directors on the board, is found to be positively correlated with earnings quality in prior research (Srinidhi et al., 2011). Board size (BDsize), the number of directors on a board, has been linked to earnings quality because a small board is deemed to be more effective in monitoring firm's managers (Ahmed, Hossain, & Adams, 2006). However, a small board is not desirable for all firms depending on the need of human capital of the directors as a result of the size and complexity of the firms (Coles, Daniel, & Naveen, 2008). Institutional ownership (Instowner) is the percentage of shares owned by substantial institutional shareholders. Sophisticated investors could exercise their monitoring function and limit the management's ability to manipulate earnings (Ramalingegowda & Yu, 2012).

Firm-specific characteristics that influence the level of accruals are also incorporated. They are BIG4, firm size, ROA, volatility, leverage, MTB ratio and M&A. The auditor effect is controlled by BIG4 (Tanyi & Smith, 2015; Carrera, Sohail & Carmona, 2017; Dhaliwal, Naiker & Navissi, 2010; Bedard, Chtourou & Courteau, 2004). I also control for several financial characteristics. Large firms may have greater incentives to manipulate earnings as a result of analysts' scrutiny (Chih et al., 2008). Firm size is measured as the natural log of total assets for the firm-year. ROA (return on assets) controls for firm profitability (Rubin & Segal, 2018; Bhuiyan, Rahman and Sultana, 2020; Chen and Gong, 2019). Firm volatility is controlled by CFVOL (operating cash flow volatility) and sales volatility (SVOL), following Demerjian, Lev & McVay (2013), Dhaliwal, Naiker & Navissi (2010) and Abernathy et al. (2013). LEV is firm

leverage measured as total assets over shareholder's equity (Sharma and Iselin, 2012; Sultana & Van der Zahn, 2015).

Market to book ratio (MTB) has been found to be negatively correlated with discretionary accruals (Menon and Williams 2004) and is often used as a control variable (Demerjian, Lev & McVay, 2013; Dhaliwal, Naiker & Navissi, 2010; Abernathy et al., 2013). Mergers and acquisitions (M&A) signifies companies that are either a target or an acquirer in the fiscal year. M&A is controlled because both sides are affected by the transaction, for example, abnormal cash outflow for acquirers and big changes for target firm (Sharma and Iselin, 2012; Marshall, Schroeder & Yohn, 2019; Zhang, 2019). Having net income less than zero (LOSS) in the period is also controlled, following Gull et al. (2018) and Ashraf et al. (2020).

4.3.3 Data Selection

The sample comprises ASX-listed firms with available financial and corporate governance data for the period 2005-2018. Corporate governance data is derived from several sources with audit committee independence and gender composition sourced from Connect4 Boardroom and audit committee expertise from SIRCA. Observations are screened out if the corporate governance data is missing for the company for all years. For companies with missing data for some directors and years, I hand collected that information from annual reports; around 10% of the information on directors was collected that way. The data for other corporate governance variables – board independence, gender composition, size and audit committee size – are derived from Connect4 Boardroom and the number of audit committee meetings was taken from SIRCA. Financial data are derived from Datanalysis and the shareholder information and

ownership come from SIRCA and Morningstar. The final sample comprises 298 firms and 3,200 firm-year observations.

Table 1 Panel A presents the distribution of observations by GICS industry sector. There are ten industry sectors represented. The materials sector takes up the highest proportion of the sample at 21.41%, followed by the industrials sector (18.22%), consumer discretionary sector (13.44%), health care sector (10.44%) and energy sector (9.69%). Other sectors account for less than 10% of the sample individually, information technology (8.69%), consumer staples (6.66%), financials (5.66%), communication service (5.06%) and utilities (0.75%). Panel A of Table 1 lists the sample distribution by year. The sample size increases from 4.75% in 2005 to 2014 at 8.59%, and then drops slightly by year. This may be partially attributed to the incompleteness of the corporate governance data in the early years of the sample period.

4.4 Empirical Results

Table 2 presents the descriptive statistics for all variables: Panel A for corporate governance variables and Panel B for financial variables and control variables. On average, 65.19% of the audit committee has some accounting financial expertise (ACExp). 26.72% of the audit committee members in the sample are equipped with accounting financial expertise (ACExp_P) and 10.88% of the committees have more than half of their members with accounting expertise (ACExp_H). 60.5% of audit committees in the sample are fully-independent (ACInd) and 83.08% of the directors on audit committee are independent (ACInd_P). In 85.53% of audit committees in the sample, the majority of their members are independent (ACInd_H). Female representation is obviously lower than other variables, with only 31.18% (ACFem) of the audit committees having female directors. 10.87% of audit committee members are female (ACFem_P), and 2.06% of the audit committees have more than half of their members female (ACFem_H).

The audit committees in the sample comprise 3.2772 (ACsize) members and the average number of years served by them on their committee is 5.66 years. The average board size is 12.4456 directors (BDsize) and 27.86% of directors on the board are independent (BDInd). The average female representation on the board is 10.31%. The average institutional shareholding is 56.89%.

Panel B presents the summary statistics of the financial variables. Columns (1) to (3) are statistics for the annual period and Columns (4) to (6) are statistics for the interim period. The discretionary accrual DA is the measure of earnings reliability, the value of which is negatively related to earnings reliability. Annual DA is -0.0009 and the interim DA is -0.0025.

Other variables in Panel B are control variables. 71.78% of the samples are audited by the Big 4 firms. The interim return on asset (ROA) is 1.3834 which is significantly higher than the annual ROA (0.0114). Sales volatility (SVOL) and operating cash flow volatility (CFVOL) are higher in annual periods because the sales revenue and operating cash flow are around twice the size of the interim counterparts. Annual leverage (LEV) is 2.1031 and annual market to book ratio (MTB) is 2.7396. Neither is significantly different from their interim counterparts. Lastly, around 3.34% of the sample were involved in merger and acquisitions (M&A) and 23% of the interim and annual observations report negative earnings.

The correlation matrix is presented in Table 2 Panel C. Due to the interconnected nature of the corporate governance variables, many variables show significant correlations. The only one affecting a test variable is between audit committee independence and audit committee female representation (0.19). Other correlations between control variables are as high as 0.55, which may affect the estimated coefficients of those variables in the model. Table 3 presents the results on the association between earnings quality and audit committee characteristics of interest. Columns (1) and (2) present the results for annual and interim discretionary accruals. The coefficients for audit committee independence are significant and negative for interim and

annual accruals. The coefficients for audit committee accounting financial expertise and female representation are not significant for any of the measures. This does not support the argument that audit committee accounting expertise enhances earnings quality by advising on the appropriateness of estimation and better monitoring of the reporting process. Female representation on the audit committee seems not to be related to the earnings characteristics either. The only hypothesis that can be rejected is H3a that the audit committee independence is not associated with interim earnings quality. H3b and H3c cannot be rejected. The robustness of the results will be reported in the next section. Comparing the level of association between interim and annual is not meaningful given that the coefficients on audit committee accounting financial expertise and female representation are not significant. The difference between the coefficients of audit committee independence on the annual and interim accruals is not significant (chi2 = 0.31, p = 0.5779). Thus, H4 cannot be rejected.

The results suggest that the audit committee independence is positively related to earnings reliability but female representation and accounting expertise on audit committee have little impact on interim earnings quality. One explanation could be that audit committees do not attach enough importance to interim reports to exert influence on earnings quality. There are other possible explanations for the lack of significance. For instance, there might be a lack of variation in audit committee attributes or an inappropriate measurement of the constructs or some degree of endogeneity. Additional tests explore these explanations to ensure the results are not obscured by sample selection or test method.

4.5 Additional Tests

4.5.1 Subsample tests with extreme audit committee attributes

Figure 1 displays the sample distribution of the measures of the audit committee characteristics and shows that the observations are clustered. Panel A shows that, for a high proportion of the audit committees in the sample, almost all committee members are independent. Similarly, he

female representation on the audit committee is close to 0 for most of the sample. The research questions try to investigate whether the differences in the examined audit committee characteristics are associated with earnings quality, and the questions may not be tested effectively with the homogenous sample because the results are mainly driven by firms with similar characteristics.

Therefore, I repeat the tests using subsamples with extreme values of each variable of interest to focus on possible differences. That is, whether having low versus high audit committee independence, expertise and female representation is associated with varying level of earnings quality. I do this by partitioning the sample into quintiles based on the percentage of the audit committee characteristics and only including observations from the top and the bottom quintiles in the regression. The test is repeated for each of the variables and a summary of the results is displayed in Table 4. The full results are provided in the Appendix B. The results are, however, qualitatively similar to the main results that the variables are largely insignificant except for audit committee expertise on interim earnings accruals.

4.5.2 Audit Committee Co-Option

In addition to the characteristics examined in this chapter, the level of audit committee co-option has also been found to be related to earnings quality (Cassell, Myers, Schmardebeck and Zhou, 2018). This is another approach to measuring audit committee independence because such audit committee members might be under the informal influence of the current CEO who was likely involved in their nomination procedure. The implied influence from the management could impair the monitoring role of the audit committee which might lead to lower earnings quality. The audit committee co-option level is measured by the percentage of the audit committee members who joined after the current CEO's appointment (Cassell et al., 2018). Hence, I also check whether the level of audit committee co-option is associated with interim and annual earnings quality.

The results are presented in Table 5. The level of audit committee co-option shows a negative association with interim accruals, which contradicts the theory proposed by Cassell et al. (2018). According to this theory, higher co-option should reduce audit committee independence, thereby increasing the likelihood of earnings manipulation. However, the findings suggest that co-opted audit committees actually restrict earnings manipulation. This contrast in findings is an interesting topic for further research.

4.5.3 Alternative measures

In the main analysis, indicator variables are used to measure the audit committee attributes. In this section I vary the measurement of these variables, using other measures to check the sensitivity of the results. Some research measures the characteristics according to the critical mass theory. The social psychology literature suggests that it is hard to change the dynamics of a group to affect its decision-making unless a certain size or level is reached (Konrad, Kramer, & Erkut, 2008). Under this threshold (critical mass), internal dissidents are often marginalized and their voices are often overlooked (Yang, Yang, & Gao, 2019). Therefore, I test whether an audit committee with more than half of its members being female and with accounting expertise is associated with earnings quality. ACExp_D and ACFem_D are each set to one if the proportion of female committee members/accounting experts are higher than 50% in an audit committee.

Table 6 presents the results using the alternative measures. The audit committee expertise dummy variable is negatively associated with the annual discretionary accrual, significant at 5% level. The coefficients on audit committee female representation dummy variable are not significantly different from zero. The results are similar to the main findings except for accounting expertise. Having more than half of the members with accounting expertise is related to annual earnings quality.

The results using the alternative measures of the percentage of the audit committee members with accounting financial expertise, being independent and being female are displayed in Table 7. They are qualitatively similar to the main results.

4.5.4 Entropy Balanced Sample

To address the concern of self-selection bias, Equation (3) is re-estimated using entropy-balanced samples where the control group observations are reweighted so the statistics for control variables are not different between the treatment group and the control group (Hainmueller, 2012). This technique is applied to the three variables of interest – ACExp, ACInd and ACFem respectively.

Table 8 Panel A presents a summary of the results for the entropy-balanced sample for each variable of interest. The coefficients on ACExp and ACFem remain insignificant. It is noticeable that the coefficient on ACInd is not significant for the annual accruals and is marginally significant for interim accruals. The positive association with audit committee independence diminishes after adjusting all other variables to be comparable. For the audit committee co-option level, however, the results remain significant after weighting.

4.5.5 Two-stage Least Squares Regression

The two-stage least squares (2SLS) instrumental variables approach is also adopted to address possible endogeneity as a result of reverse causality/simultaneity. Contrary to the predictions that independent directors on the audit committee restrain earnings manipulation, it might be that firms with less managerial opportunism are more likely to include independent directors on their audit committee. Another common problem is the omitted variables problem that some unidentified factors are correlated to both earnings quality and audit committee characteristics, so the error term of the model is correlated with the variable of interest which leads to misleading results.

The instrumental variables should be correlated with audit committee characteristics but not directly related to the earnings quality except through the impact of the audit committee. The first instrumental variable chosen is the percentage of female directors in an industry, following Zalata et al. (2019). Industries with a large female labour base are more likely to appoint more female directors because there are more qualified female candidates (Srinidhi et al., 2011) and greater peer pressure from competing firms in promoting gender equality. Firms in industries with more female employees and customers can also attain greater legitimacy by incorporating female directors. Also, the proportion of female directors in the industry does not directly influence the earnings quality of individual firms.

The characteristics of the nomination committee are also used as an instrumental variable following Sultana (2015). More specifically, I use the size, independence and female representation of the nomination committee that is responsible for appointing the members of audit committees. Theoretically, the attributes of the nomination committee are not directly related to earnings quality except through their influence on the audit committee's composition. The third and final instrumental variable is the existence of accounting expertise on the board before 2003 when the ASX first released its Good Corporate Governance Principles and Recommendations. Firms with accounting expertise before the external requirement/recommendation are more likely to have a greater proportion of accounting expertise either because there is a need for it or because they value the benefits brought by accounting experts. This variable is not perceived to be directly related to the earnings quality in the sample period. Table 9 presents the results for the second stages for variables of interest. All the variables become insignificant including the association between audit committee independence and the audit committee co-option level.

4.5.6 Other tests

I also repeat the main tests in subsamples in which the effect might be more strongly concentrated. First, I test using the firms with relatively low corporate governance quality. The effect of audit committee action may be marginal for companies with good corporate governance because other mechanisms contribute efficiently to reporting quality. I also investigate whether firm size affects the test results considering that corporate governance in small firms can be tokenistic. Furthermore, I check firms with greater discretion in financial reporting, like firms in the IT industry, firms audited by non-big four firms and firms with greater market pressure (high market to book ratio). Lastly, I examine whether the changes in the number of audit committee independent/female directors and financial experts have an influence on interim earnings quality in the current or the following year. The full results are presented in the Appendix B, and they are consistent with previous analyses that audit committee attributes have no relation to interim earnings quality.

4.6 Conclusion

In this chapter, I examine the association between interim earnings quality and audit committee attributes, specifically audit committee independence, accounting expertise and female representation. The results indicate that audit committee independence may be positively associated with interim and annual earnings reliability, although the association is not consistently robust. Audit committee accounting expertise and female representation do not have significant associations with annual or interim earnings quality.

The quality of corporate governance is of importance to investors and regulators. The common understanding is that they rely on corporate governance as a kind of assurance for earnings quality because the latter is not directly observable. However, the results in this chapter challenge this understanding. As the subcommittee that is responsible for financial reporting quality, the quality of an audit committee is found not to have an impact on interim earnings quality. One explanation is that the audit committee is not discharging its responsibility of

efficiently ensuring financial reporting quality. Combined with the findings from the previous chapter, investors might need to remain alert in making financial decisions using interim earnings. Not only is the external oversight on interim reporting less rigorous, but its internal regulation does not contribute to regulating earnings quality either. The results also inform regulators that interim earnings integrity might be improved by raising the awareness of the audit committee to its potentially greater role in interim reporting, considering the current level of awareness is minimal.

Previous results on the association between audit committee characteristics and earnings quality are mixed. The divergence may be a result of the difference in the sample period and the context. The results may not be generalizable to other time periods or to other institutional settings that are vastly different from Australia. Corporate governance research is also fraught with measurement errors, endogeneity, stickiness and model misspecification. Although I used various measures for the constructs, controlled for possible economic determinants of accounting results and adopted statistical methods to address the endogeneity concern, not even this research is devoid of these problems.

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Table 1

Panel A: Distribution of observation by industry and years

GICS code	Sector description	Observations	Percentage
10	Energy	310	9.69%
15	Materials	685	21.41%
20	Industrials	583	18.22%
25	Consumer Discretionary	430	13.44%
30	Consumer Staples	213	6.66%
35	Health care	334	10.44%
40	Financials	181	5.66%
45	Information Technology	278	8.69%
50	Communication Services	162	5.06%
55	Utilities	24	0.75%
	Total	3200	100.00%

Year	Observations	Percentage
2005	152	4.75%
2006	160	5.00%
2007	185	5.78%
2008	202	6.31%
2009	214	6.69%
2010	222	6.94%
2011	235	7.34%
2012	256	8.00%
2013	259	8.09%
2014	275	8.59%
2015	268	8.38%
2016	259	8.09%
2017	256	8.00%
2018	257	8.03%
Total	3200	100.00%

Panel B: Notation and definitions of variables

Variable	Definition
Earnings quality variables:	
DA	The discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) measured as the residuals from the following regression by industry sector: $TA_{i,t} = \alpha_1 * \left(\frac{1}{ASSETS_{1,t-1}}\right) + \alpha_2 * \left[\frac{(\Delta REV_{i,t} - \Delta AR_{i,t})}{ASSETS_{1,t-1}}\right] + \alpha_3 * \frac{PPE_{i,t}}{ASSETS_{1,t-1}} + \varepsilon_{i,t}$, measured from 2005-2018 (see 4.1.1)
Corporate governance variables:	
AcExp	The accounting expertise of an audit committee measured as indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise. The audit committee members are recorded as accounting financial expert if he/she is a Certified Public Accountant, Chartered Financial Analyst or had work experience in an accounting or auditing position.
AcExp_P	The percentage of audit committee members with accounting financial expertise for firm i in year t.
AcExp_H	Indicator variable where firm i in year t is scored 1 if at least half of the audit committee is defined as an accounting financial expert, 0 otherwise.
ACInd	Indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t.
ACind_P	The percentage of independent audit committee members for firm i in year t.
ACind_H	Indicator variable where firm i in year t is scored 1 if at least half of the audit committee members are independent, 0 otherwise.
ACFem	The female representation of audit committee measured as indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise.
ACfem_P	The percentage of female audit committee members for firm i in year t.
ACfem_H	Indicator variable where firm i in year t is scored 1 if at least half of the audit committee members are female, 0 otherwise.
ACsize	Audit committee size measured as the number of audit committee members for firm i in year t.

BDind	Board independence measured as the percentage of independent board members for firm i in year t.
ACtenure	The average number of years the audit committee members for firm i have been on the audit committee as of year t
BDIND	The board independence for the company-year proxied by the percentage of independent directors on board for firm i in year t
BDFem	The female representation on board measured as the percentage of female directors on board for firm i in year t.
BDsize	Board size measured as the number of directors on board for firm i in year t.
Instowner	the percentage of shares owned by substantial institutional shareholders

Financial variables:

BIG4	Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise
Size	The natural log of the total asset of the firm-year observation
ROA	Earnings before interest / (total assets less outside equity interests).
Leverage	Total assets/shareholders' equity
MTB	Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity
SVOL	Sales volatility procied by the standard deviation of firm's sales revenue scaled by lagged total assets
CFVOL	Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets
BDIND	The board independence of the firm-year proxied by the percentage of independent directors on board
BDFEM	The female representation on board proxied by the percentage of female directors on board
LOSS	Indicator variable coded as one if the net income of the period is less than zero
M&A	Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms

Table 2 Descriptive statistics

	Full sample (N= 3,200)		
Variable	Mean	Median	Std Dev
	(1)	(2)	(3)
ACExp	0.6519	1	0. 4764
ACExp_P	0.2672	0.2500	0.2447
ACExp_H	0.1087	0	0.3113
ACInd	0 .605	1	0 .4889
ACInd_P	0.8308	1	0.2458
ACInd_H	0.8553	1	0.3518
ACFem	0.3118	0	0.4632
ACFem_P	0.1078	0	0.1763
ACFem_H	0.0206	0	0.1421
ACsize	3.2772	3	0.9714
ACtenure	5.6562	4.75	3.7283
BDsize	12.4456	12	4.0384
BDInd	0.2786	0.2857	0.1428
BDFem	0.1031	0.0833	0.1075
Instiown	0.5689	0.5946	0.2267

Panel B: Financial variables

	Annual (N = 3,200)			Interim (N = 3,200)			
Variables	Mean	Median	Std Dev	Mean	Median	Std Dev	T stat
DA	-0.0009	0.0106	0.1084	-0.0025	-0.0031	0.0930	0.8674
Size	2.31e+09	2.38e+08	6.57e+09	2.35e+09	2.49e+08	6.58e+09	-0.2515
BIG4	0.7178	1	0.4501	-	-	-	-
ROA	0.0114	0.0630	0.4787	1.3834	3.1900	12.1818	-6.3666
SVOL	0.3985	0.2427	0.7526	0.2344	0.1340	0.6613	9.2677
CFVOL	0.1312	0.0824	0.1966	0.0825	0.0488	0.1633	10.7749
Leverage	2.1031	1.7415	1.4917	2.1322	1.5446	1.5446	-0.7668
MTB	2.7396	1.6900	3.4065	2.8585	1.725	3.5372	-1.3693
M&A	0.0334	0	0.1798	-	-	-	-
LOSS	0.2341	0	0.4235	0.2359	0	0.4246	-0.1769

Panel C:

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
DA	(1)	1																	
ACInd	(2)	-0.07*	1																
ACExp	(3)	0.03	-0.01	1															
ACFem	(4)	-0.02	0.19*	0.09*	1														
ACsize	(5)	0.01	-0.06*	0.17*	0.32*	1													
ACtenure	(6)	0.00	-0.07*	-0.01	-0.12*	-0.13*	1												
BDInd	(7)	0.00	0.44*	0.04	0.31*	0.22*	-0.08*	1											
BDFem	(8)	-0.02	0.15*	0.04	0.55*	0.19*	-0.07*	0.23*	1										
BDsize	(9)	-0.01	0.14*	0.10*	0.35*	0.42*	-0.18*	0.10*	0.23*	1									
Insitown	(10)	-0.00	0.00	-0.00	0.20*	0.12*	-0.02	0.07*	0.12*	0.14*	1								
size	(11)	0.00	0.26*	0.12*	0.43*	0.39*	-0.03	0.35*	0.26*	0.64*	0.34*	1							
ROA	(12)	0.21*	0.02	0.12*	0.06*	0.08*	0.08*	0.03	0.02	0.06*	0.09*	0.24*	1						
SVOL	(13)	0.09*	-0.07*	-0.03	-0.09*	-0.06*	-0.06*	-0.07*	-0.04	-0.06*	0.01	-0.09*	0.01	1					
leverage	(14)	-0.03	0.08*	0.01	0.12*	0.08*	-0.04	0.06*	0.09*	0.17*	0.04	0.16*	-0.02	-0.01	1				
MTB	(15)	0.01	0.02	0.04	0.04	0.00	-0.03	0.03	0.03	-0.01	-0.08*	-0.14*	-0.01	0.00	0.29*	1			
M&A	(16)	0.02	0.05*	-0.01	-0.02	0.03	-0.01	0.01	-0.04	0.03	0.04	0.11*	-0.00	-0.02	-0.02	-0.04	1		
CFVOL	(17)	0.02	-0.06*	-0.10*	-0.12*	-0.11*	-0.05	-0.07*	-0.09*	-0.11*	-0.04	-0.21*	-0.15*	0.50*	-0.06*	0.10*	-0.02	1	
LOSS	(18)	-0.12*	-0.06*	-0.13*	-0.18*	-0.14*	-0.06*	-0.10*	-0.10*	-0.17*	-0.13*	-0.33*	-0.55*	0.00	-0.01	-0.01	-0.00	0.14*	1

Table 3 Earnings quality and audit committee characteristics

	(1)	(2)
	Annual	**Interim**
	DA	**DA**
ACExp	-0.0011	0.0022
	(-0.28)	(0.63)
ACInd	-0.0189***	-0.0156***
	(-4.18)	(-4.05)
ACFem	-0.0057	0.0001
	(-1.05)	(0.03)
ACsize	-0.0046**	0.0003
	(-2.00)	(0.17)
ACtenure	0.0001	-0.0002
	(0.14)	(-0.38)
BD_ind	0.0164	0.0347**
	(1.00)	(2.48)
BDfem	0.0373*	-0.0029
	(1.70)	(-0.15)
BDsize	0.0011	0.0010*
	(1.59)	(1.76)
InOwn	0.0140	-0.0039
	(1.48)	(-0.49)
size	0.0035**	-0.0037***
	(2.13)	(-2.64)
ROA	0.0309***	0.0016***
	(7.21)	(10.10)
SVOL	-0.0005	0.0118***
	(-0.20)	(4.14)
BIG4	-0.0049	-0.0133***
	(-1.06)	(-3.35)
leverage	-0.0031**	0.0004
	(-2.17)	(0.36)
MTB	-0.0011*	0.0003
	(-1.79)	(0.63)
M_A	-0.0085	0.0088
	(-0.81)	(0.98)

CFVOL	-0.0284**	-0.0038
	(-2.54)	(-0.32)
loss	-0.0245***	-0.0128***
	(-4.64)	(-2.65)
Cons	-0.0544**	0.0585***
	(-2.02)	(2.59)
N	3200	3200
Adjusted R^2	0.0584	0.0711
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

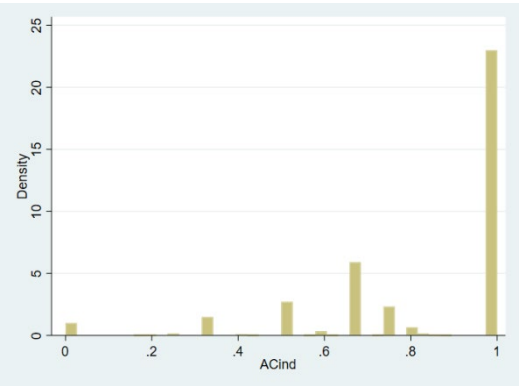
***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.
This table shows test results on the relation between earnings quality measures and audit committee characteristics. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

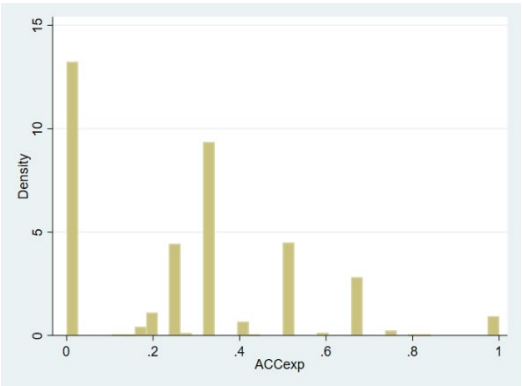
Where:
DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2)
ACExp = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;
ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

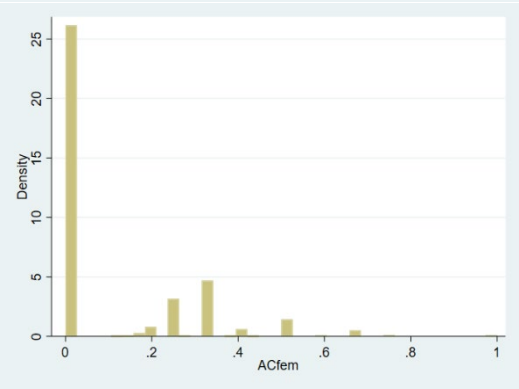
Figure 1: Sample distribution of audit committee characteristics

Pane A: Audit committee independence



Panel B: Audit committee expertise





Panel C: Audit committee female representation

Table 4 Earnings quality and audit committee characteristics with extreme percentage

	(1) DA Annual	(2) DA Interim
Test variable		
ACExp	-0.0079	0.0051
	(-1.07)	(0.94)
ACInd	-0.0267***	-0.0129*
	(-3.26)	(-1.91)
ACFem	-0.0077	0.0012
	(-1.03)	(0.18)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.
This table shows the summary results on the relation between earnings quality measures and audit committee characteristics between the top and bottom quartiles. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively.

Table 5 Earnings quality and audit committee co-option level

	(1)	(2)
	DA	**DA**
	Annual	**Interim**
ACCo_op	-0.0023	-0.0175***
	(-0.43)	(-3.91)
ACind	-0.0031	-0.0011
	(-0.74)	(-0.31)
ACCexp	-0.0196***	-0.0142***
	(-4.13)	(-3.55)
ACfem	-0.0040	-0.0012
	(-0.72)	(-0.26)
ACsize	-0.0043*	0.0008
	(-1.80)	(0.38)
ACtenure	0.0003	0.0001
	(0.45)	(0.19)
BD_ind	0.0202	0.0387***
	(1.20)	(2.72)
BDfem	0.0412*	-0.0033
	(1.81)	(-0.17)
BDsize	0.0010	0.0008
	(1.40)	(1.34)
InOwn	0.0166*	-0.0045
	(1.66)	(-0.53)
size	0.0035**	-0.0029**
	(2.01)	(-1.99)
ROA	0.0305***	0.0015***
	(5.93)	(8.35)
SVOL	0.0018	0.0018
	(0.60)	(0.42)
BIG4	-0.0037	-0.0131***
	(-0.74)	(-3.14)
leverage	-0.0027*	0.0007
	(-1.84)	(0.59)
MTB	-0.0010	0.0003
	(-1.58)	(0.66)
M_A	-0.0071	0.0073
	(-0.66)	(0.80)
CFVOL	-0.0311***	0.0025
	(-2.71)	(0.20)
loss	-0.0199***	-0.0152***
	(-3.59)	(-2.96)
N	2911	2911
Adjusted R^2	0.0522	0.0642
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.
This table shows test results on the relation between earnings quality measures and audit committee characteristics. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:
DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **INMEA** = the interim indicativeness measure (see 4.1.2); **ACCo-op** = The number of audit committee members who joined the board after the current CEO's appointment divided by the number of audit committee members; **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t; **ACFem** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Table 6 Sensitivity tests with alternative audit committee characteristics measurements

	(1)	(2)
	DA	**DA**
ACExp_D	-0.0156**	0.0028
	(-2.52)	(0.53)
ACInd	-0.0191***	-0.0156***
	(-4.23)	(-4.07)
ACFem_D	-0.0040	-0.0078
	(-0.29)	(-0.67)
ACsize	-0.0059**	0.0005
	(-2.54)	(0.26)
ACtenure	0.0002	-0.0002
	(0.31)	(-0.43)
BD_ind	0.0149	0.0351**
	(0.91)	(2.51)
BDfem	0.0299	-0.0009
	(1.48)	(-0.05)
BDsize	0.0011	0.0010*
	(1.60)	(1.78)
InOwn	0.0142	-0.0041
	(1.51)	(-0.52)
size	0.0035**	-0.0037***
	(2.15)	(-2.63)
ROA	0.0309***	0.0016***
	(7.22)	(10.15)
SVOL	-0.0002	0.0118***
	(-0.09)	(4.13)
BIG4	-0.0052	-0.0133***
	(-1.12)	(-3.35)
leverage	-0.0031**	0.0004
	(-2.20)	(0.35)
MTB	-0.0011*	0.0003
	(-1.80)	(0.66)
M_A	-0.0087	0.0087
	(-0.83)	(0.97)
CFVOL	-0.0291***	-0.0040
	(-2.60)	(-0.33)
loss	-0.0247***	-0.0129***
	(-4.70)	(-2.66)
Cons	-0.0489*	0.0579***
	(-1.86)	(2.62)
N	3200	3200
Adjusted R^2	0.0600	0.0712
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.
This table shows test results on the relation between earnings quality measures and audit committee characteristics. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp\_D + \beta_3 ACFem\_D + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:

DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp_D** = indicator variable where firm i in year t is scored 1 if at least 50% of the audit committee are defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t; **ACFem_D** = indicator variable where firm i in year t is scored 1 if at least 50% the audit committee members are female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Table 7 Alternative audit committee characteristics measurements

	(1)	(2)
	Annual DA	**Interim DA**
ACExp_P	-0.0077	0.0073
	(-0.98)	(1.10)
ACInd_P	-0.0486***	-0.0440***
	(-5.18)	(-5.53)
ACFem_P	-0.0131	-0.0039
	(-0.93)	(-0.33)
ACsize	-0.0046**	0.0011
	(-2.05)	(0.58)
ACtenure	0.0001	-0.0001
	(0.24)	(-0.33)
BD_ind	0.0282*	0.0488***
	(1.67)	(3.39)
BDfem	0.0354	-0.0009
	(1.61)	(-0.05)
BDsize	0.0014**	0.0013**
	(2.03)	(2.27)
InOwn	0.0118	-0.0058
	(1.25)	(-0.72)
size	0.0037**	-0.0036**
	(2.24)	(-2.56)
ROA	0.0316***	0.0017***
	(7.37)	(10.32)
SVOL	-0.0005	0.0117***
	(-0.18)	(4.11)
BIG4	-0.0046	-0.0125***
	(-0.99)	(-3.15)
leverage	-0.0032**	0.0003
	(-2.29)	(0.27)
MTB	-0.0010*	0.0004
	(-1.65)	(0.81)
M_A	-0.0082	0.0094
	(-0.78)	(1.05)
CFVOL	-0.0268**	-0.0014
	(-2.39)	(-0.12)
loss	-0.0247***	-0.0122**
	(-4.69)	(-2.52)
Cons	-0.0352	0.0715***
	(-1.31)	(3.17)
N	3200	3200
Adjusted R^2	0.0613	0.0712
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.
This table shows test results on the relation between earnings quality measures and audit committee characteristics. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:
DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2**ACExp_P** = the percentage of the audit committee members defined as an accounting financial expert; **ACInd_P** = the percentage of the audit committee members being independent; **ACFem_P** = the percentage of the audit committee members being female; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Table 8: Sensitivity tests with the entropy balanced sample

	DA Annual	DA Interim
Test variable		
ACExp	-0.0004	0.0041
	(-0.11)	(1.25)
ACInd	-0.0056	-0.0083*
	(-1.11)	(-1.66)
ACFem	-0.0013	-0.0033
	(-0.29)	(-0.78)
co_op	-0.0006	-0.0159***
	(-0.10)	(-3.44)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
N	3,200	3,200

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.
This table is a summary of the test results on the relation between earnings quality measures and audit committee characteristics using entropy balanced sample. The treatment groups are set for each of the examined audit committee characteristics and the entropy balanced weight is incorporated in each of the regression. Other control variables remain the same. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively.

Table 9: Sensitivity tests with instrumental variables

	(1)	(2)
	DA	**DA**
co_op	0.4570	0.3829
	(0.67)	(0.65)
ACExp	0.2803	0.3417
	(0.49)	(0.65)
ACInd	0.0322	0.1688
	(0.12)	(0.61)
ACFem	0.0122	0.0046
	(0.23)	(0.08)
ACsize	-0.0166	-0.0028
	(-0.98)	(-0.21)
ACtenure	0.0156	0.0136
	(0.68)	(0.68)
BD_ind	0.0278	-0.1488
	(0.11)	(-0.53)
BDfem	-0.0973	-0.2288
	(-0.37)	(-0.93)
BDsize	0.0091	0.0068
	(0.74)	(0.72)
InOwn	0.0779	0.0539
	(0.66)	(0.55)
size	-0.0189	-0.0196
	(-0.52)	(-0.70)
ROA	0.0419	-0.0002
	(1.43)	(-0.08)
SVOL	0.0143	0.0279
	(0.37)	(0.63)
BIG4	-0.0059	-0.0205
	(-0.30)	(-0.92)
leverage	0.0107	0.0075
	(0.56)	(0.61)
MTB	-0.0063	-0.0044
	(-0.64)	(-0.65)
M_A	0.0196	0.0197
	(0.54)	(0.59)
CFVOL	0.0278	0.0715
	(0.26)	(0.65)
loss	0.0007	0.0049
	(0.02)	(0.20)
Cons	-0.2469	-0.2417
	(-0.65)	(-0.61)
N	2010	2010
IV	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.

This table shows the second stage results on the relation between earnings quality measures and audit committee characteristics following Two-stage least squares (2SLS) instrumental variables approach. The instrumental variables are the percentage of female directors in the industry, the size, independence and female representation of the nomination committee and the existence of accounting expertise on the board before 2003. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively.

Chapter 5

Stock Market Response to Interim Reporting

5.1 Introduction

A primary objective of financial statements is to provide financial information about the reporting entity that is useful to external users who cannot require entities to provide information directly to them (AASB, 2021). Current and potential investors are important categories of such external users. Hence, the market relevance to earnings is of great interest to researchers. Event studies of earnings announcements date back to the seminal work of Ball and Brown (1968) and Beaver (1968), and the importance of earnings announcements to the capital market has been documented in the U.S. (Basu et al., 2013; Beaver, McNichols, & Wang, 2020) and in Australia (Taylor & Tong, 2022). Although the overall importance of earning announcements is acknowledged, the relative importance of interim earnings announcements compared to annual earnings announcements is less well understood. In this chapter, I compare the market response to interim and annual earnings announcements in Australia and explore the response variations related to good news and bad news.

An interim period is a financial reporting period shorter than a full financial year, which is a quarter for U.S. and a half-year for most ASX-listed firms, except for gas and oil and mining companies. Accordingly, there are three interim earnings announcements per fiscal year in the U.S. for the first, second and third quarters, Q1, Q2 and Q3, but only one interim earnings announcement per fiscal year (for the first half) in Australia. In this study, U.S. interim earnings means the earnings for the first three quarters while interim earnings in Australia refers to the earnings of the first half-year. Prior studies primarily focus on the U.S. quarterly reporting regime, comparing the market response of interim earnings announcements (Q1, Q2 and Q3) and the fourth quarter earnings announcements. Such comparisons are not directly transferrable to the Australian setting because of the institutional differences between the U.S. and Australia.

The most conspicuous institutional difference is that Australian listed firms report half-yearly (mining and oil and gas firms being the major exception) and U.S. firms report quarterly. Furthermore, in Australia the second half-year earnings is not separately reported. In comparing market responses to interim earnings announcements between U.S. and Australia, it may be argued that half-yearly reporting would trigger a lower market response given that it is less timely than quarterly reporting. The expectation of a lower market response would be heightened in Australia because the Continuous Disclosure Regime (CDR) promotes the timely disclosure of material information aimed at reducing internal/external information asymmetry. In contrast, the continuous disclosure of material events might not diminish the information content in earnings announcements significantly because the individual disclosures describe discrete and isolated events, so their impact on the overall performance and financial position may not always be clear (Rubin et al., 2017). Also, such disclosures do not necessarily quantify performance and could be hard for investors to interpret (Li & Tan, 2022). Anecdotal evidence also suggests that the CDR is not well enforced in Australia, which means that earnings announcements would still contain news for the market. Furthermore, the Australian capital market is not as efficient as America's and there is a lower analyst following, leading to greater importance being given to earnings announcements as a means of informing investors.

The first research question compares the market responses to interim earnings surprises versus annual earnings surprises. Although both interim and annual earnings contain earnings news for a six-month period, annual earnings result could be more accurate because it is not as affected by measurement errors as the interim earnings, and the inputs to annual earnings are more complete and/or more certain. The findings from prior chapters indicate that annual earnings are more accurate and persistent than interim earnings. Furthermore, the audit process enhances the credibility of the annual earnings. The stronger market response to increased

assurance level is established in the literature (Haw et al., 2008; Manry et al., 2003; Marshall, Schroeder, & Yohn, 2019).

Prior research considers that the difference, if there is any, should be more pronounced for small firms because interim earnings of large firms are more closely monitored by internal and external governance mechanisms (Kross & Schroeder, 1990; Lee et al., 2016). In Chapter 3, the relative reliability of interim earnings to annual earnings is found to be lower for small firms. Hence a greater difference is expected in the market response to interim versus annual earnings for small firms if the market reflects earnings quality accurately. However, ASX-listed firms are relatively small compared to U.S. firms, and the earnings announcements of small firms in Australia might not evoke enough market response. The results show a greater market response to annual earnings only for large firms but not for small firms. Given that there is a greater earnings quality difference for small firms, a possible explanation is that earnings announcements for small firms in Australia do not attract much attention, which is supported by the limited trading activity for small firms

In pursuit of the second research question, market responses are examined to good and bad news in interim and annual earnings. In this study, the terms "good news" and "bad news" refer to the informational input to the capital market, that is, positive earnings surprises for good news and negative earnings surprises for bad news. The asymmetrical market reaction to good and bad news has been observed in capital markets (Kyaw, Olugbode, & Petracci, 2020), and this reaction is expected to compound the different market responses to interim and annual earnings. Mendenhall and Nichols (1988b) and Jones and Bublitz (1990) find greater market reactions to bad news in the interim quarters than in the fourth quarter. The difference is attributed to a bad news deferral effect; investors expect management to withhold bad news until the fiscal year-end when the release is inevitable in the face of external scrutiny (Mendenhall & Nichols, 1988b). As a result, bad news in interim periods is perceived to be

more credible because it is against management's incentives (D'Augusta, 2022; Ng, Tuna, & Verdi, 2013).

Bad news deferral is common in the U.S. (Kothari, Shu, & Wysocki, 2009). CDR in Australia might restrain managers from deferring bad news, and so the applicability of the bad news deferral argument to Australia depends on how effective the CDR is. This does not mean that the Australian information environment is superior to that in the U.S. They are simply different, and this difference is worth investigating. Alternatives mechanisms in U.S. ensure the timely and equitable communication of business events including the Securities Act of 1934, Reg FD, greater analyst coverage and greater media attention. Hence, the extent to which the bad news deferral argument applies in the Australian context is an empirical question. Accordingly, the second research question examines whether the market response to interim bad news is stronger than its response to annual bad news.

As for studies of good news in the U.S., the market reaction to annual is found to be stronger than to interim (Dempsey, 1994). In Australia, a greater market response to annual good news might be expected because of greater embedded credibility. In addition, the behavioural characteristics of retail investors and their greater participation in annual earnings trading may also be linked to the greater market response to annual good news. I summarise and discuss possible explanations in the literature review and explore the nuances of the Australian interim reporting context in the hypothesis development. For large firms, the market responses to interim bad news is found to be stronger than to annual bad news and the responses to annual good news is stronger than to interim good news. Additional analysis suggests that the greater attention and market participation of retail investors to annual earnings might not be the explanation for the differential market response.

This study makes several contributions. First, it helps investors to understand market behaviour surrounding interim versus annual earnings announcements and the way this varies between

good and bad news. Second, this research contributes to the extant literature on interim reporting. I examine the question in a new setting that differs from that of most existing research in several ways. Finally, the findings could be of interest to market regulators and standard setters who need to evaluate the benefits and costs of the requirements on interim reporting. The preparation of interim report could be costly, especially for small firms with limited resources. If the benefit of interim reporting in informing investors is limited for small firms and the relative cost is greater, regulators might consider alleviating the burden of interim reporting for small firms.

The remainder of this chapter is organised as follows. The next section presents the literature review on the market response to interim reporting followed by hypothesis development. Section 3 describes the sample selection and research method. Section 4 discusses the results and Section 5 concludes.

5.2 Literature Review

5.2.1 Market Response to Interim versus Annual Earnings Announcements

The importance of earnings information for the capital market has been established since Ball and Brown (1968), and more recent event studies have revealed more of the nuances of the market response. Earnings announcements are considered as one, possibly the most important, way of documenting accounting information provided to the capital market, and extensive academic evidence lends support to its prominence (Alves & Teixeira Dos Santos, 2008; Ball & Brown, 1968; Ball & Shivakumar, 2008; Basu et al., 2013; Li & Ramesh, 2009). While calamitous or fortuitous event announcements may have great impact, earnings announcements are regular, and their timing is predictable. Although the importance of annual earnings announcements is acknowledged, the value added by interim earnings announcements is not as clear. The existing literature on the comparative salience of interim versus annual earnings to the capital market is not conclusive.

Most studies on interim reporting are undertaken in a quarterly reporting context and mainly in the U.S. Comparisons are generally made between the interim quarters' earnings (Q1, Q2 and Q3) and Q4 earnings. May (1971) and Foster (1977) find the market responses to interim quarter earnings and to fourth-quarter earnings are not substantially different. Kross and Schroeder (1990) emphasise the need to control for size and examine the same question in small firms. They show that the market response to the fourth quarter earnings is significantly smaller than to the other three quarters' earnings response due to the integral effect. Salamon and Stober (1994) went on to find the same for both large and small firms. The smaller market response to fourth-quarter earnings is substantiated in subsequent research (Chen, Jiang, & Zhu, 2022; Kama, 2009). In contrast, Cornell and Landsman (1989) find a greater market response to fourth-quarter earnings. A greater market response to fourth-quarter earnings is also found in Singapore (Lee et al., 2016) and in Portugal (Alves & Teixeira Dos Santos, 2008).

The divergence of findings in prior studies may be explained in two ways: the integral explanation and credibility theory. Under the integral explanation, the fourth quarter earnings result contains more noise due to a "settling-up" effect (Rangan & Sloan, 1998). Under the integral approach under the U.S. GAAP, interim periods (each quarter) are integral parts of the annual period. If a specific cost or expense item benefits more than one interim period, the cost or expense item may be allocated to those interim periods (ASC 270). Consequently, the fourth-quarter earnings entry contains corrections of the estimation errors in earlier quarters unless the firm restates the earnings of the interim quarters, which can be costly to the firm (and is not required). Higher earnings volatility, greater forecast errors and less information content in the fourth quarter earnings are all consequences of the settling-up effect (Collins, Hopwood, & McKeown, 1984; Gunny et al., 2013), which leads to a less strong market response to fourth-quarter earnings surprises (Jones & Bublitz, 1990).

Credibility theory suggests that the stock market response to accounting information is contingent on its perceived credibility (Pevzner, Xie, & Xin, 2015). The audit effect hypothesis and transparency theory similarly posit that the market responds positively to characteristics that are considered to enhance the credibility of reported earnings, i.e. external assurance (Lee et al., 2016) and corporate governance quality (Beekes & Brown, 2006; Beekes et al., 2015; Shin & Kim, 2018; Siew Hong, Ivo, & Wong, 1998). These arguments are connected because a disclosure's credibility is not only influenced by its characteristics but also by management's credibility and the applicable degree of external and internal assurance (Mercer, 2004).

Credibility theory suggests a greater market response to either interim earnings or to fourth-quarter earnings, contingent on their perceived comparative credibility. Some U.S. studies justify a greater market response to interim earnings because they believe earnings manipulations concentrate in the fourth quarter. For example, Givoly and Ronen (1981) and Das et al. (2009) find evidence of manipulations in the fourth quarter to avoid extreme earnings changes. Furthermore, earnings management through classification shifting (Fan, Barua, Cready, & Thomas, 2010) and classificatory smoothing (Gibbins, 1977) in the fourth quarter are also documented. The integral explanation and the credibility explanation are not mutually exclusive and may in fact be complementary as the noisy fourth-quarter reporting environment provides greater opportunity for earnings management (Chen et al., 2022). Both lines of research identify greater frequency and magnitude of special items in the fourth quarter (Burgstahler, Jiambalvo, & Shevlin, 2002; Jones & Bublitz, 1990; Michael & Robert, 1997; Palepu, 1988).

In contrast, earnings manipulation is identified in interim periods – as cosmetic earnings management (Guan et al., 2006), pension cost manipulation (Blankley et al., 2013), biased tax estimation (Comprix et al., 2012) and restructuring charges (Moehrle, 2002). Combined with the perception that managers exploit opportunities to delay and withhold bad news in interim

quarters (Kothari et al., 2009; Marinovic & Varas, 2016; Mendenhall & Nichols, 1988a), investors could attach less credibility to interim earnings. Less timely and less strong market responses thus ensue because investors choose to be more discreet and to wait for more information to confirm the news (Francis et al., 2007).

A significantly stronger market reaction to increased assurance levels is documented in prior literature in U.S. and several other institutional settings (Haw et al., 2008; Kajuter et al., 2016a; Lin & Yen, 2017; Manry et al., 2003; Marshall et al., 2019). Investors attach value to audit even if only as a signalling effect (Kajuter et al., 2016b). Alves and Teixeira Dos Santos (2008) and Lee et al. (2016) rely on the audit effect hypothesis, which is closely related to credibility theory because a greater market response is a result of higher perceived credibility.

5.2.2 Market Response to Good versus Bad News

Prior literature indicates that the direction of the market response to new information is consistent with the type of surprise – that is, it is a positive response towards good news and a negative response towards bad news – but the magnitude of the response varies between good and bad news (Ball & Brown, 1968; Basu, 1997; Kyaw et al., 2020; Lopez & Rees, 2002). There are several explanations for this, in particular, credibility theory and the constraints of arbitrage (Alwathnani, Dubofsky, & Al-Zoubi, 2017; Bartov et al., 2002; Cohen, Marcus, Rezaee, & Tehranian, 2018; Kasznik & McNichols, 2002; Mendenhall, 1991). The asymmetrical market response to good and bad news could have further implications for the comparative relation between the market response to interim earnings and annual earnings (Dempsey, 1994; Jones & Bublitz, 1990; Mendenhall & Nichols, 1988a).

For annual earnings, the market response to good news is greater than to bad news because it is likely to be more persistent as a result of the asymmetric treatment inherent in accounting standards (Basu, 1997). Many accounting standards recognise bad news on a timelier basis with less verification to deter managers from accumulating and delaying the disclosure of bad

news (D'Augusta, 2022; Kim & Pevzner, 2010; Kim & Zhang, 2016), for example, fair value recognition of non-current assets. However, bad news deferral incentives and practices still exist in the U.S. (Bertomeu, Ma, & Marinovic, 2020; Kothari et al., 2009).

The bad news deferral argument is related to credibility theory, wherein the market response is contingent on the perceived level of credibility of the earnings announcements. Theoretically, the market response should be similar if the perceived level of credibility is the same for good news and bad news. However, bad news is seen to be inherently more credible because of perceived managerial incentives to withhold or delay it (Bloomfield, 2021; Hutton, Miller, & Skinner, 2003). When there is greater opportunity for managers to defer the bad news, the market response to bad news should be stronger (D'Augusta, 2022; Ng et al., 2013). Although interim earnings may be subject to less managerial discretion compared to voluntary disclosures, they are not as reliable as the annual report because they are not audited and are more estimation-based, which enables greater opportunity to hide and delay bad news. Therefore, the market response to interim bad news could be stronger than to the annual bad news (Mendenhall & Nichols, 1988a).

Another explanation for the asymmetrical market response relates to short-sale constraints (Li & Tan, 2022; Shleifer & Vishny, 1997). Instead of assuming that all market participants are rational agents, this explanation divides investors into two types that exhibit distinct behavioural patterns. The first type is characterised as sophisticated and rational arbitrageurs like institutional investors, who search for information actively and continuously. They transact on information in a timely fashion so as to exploit market opportunities, but they often have short-term capital constraints (Li & Tan, 2022). The second type is characterised as retail investors, who mainly trade on "attention" and tend to over-react to good news and under-react to bad news (Frank & Sanati, 2018). The dynamic interaction between the two types of

investors causes frictions in the market and the short-sale constraints from arbitrageurs drive the market away from efficiency (Shleifer & Vishny, 1997).

Retail investors' over-reaction to good news and under-reaction to bad news can be explained by overconfidence and biased self-attribution (Daniel, Hirshleifer, & Subrahmanyam, 1998). They attribute past good performance to their superior trading ability which usually leads to excess trading but not necessarily to less trading or selling with poor performance (Benos, 1998; Gervais & Odean, 2001). Other evidence in relation to the irrational trading behaviour of retail investors includes the disposition effect and the contrarian investment strategy. Both explain that they sell winners too soon and hold on to losers for too long (Odean, 1998; Shefrin & Statman, 1985; Vieru, Perttunen, & Schadewitz, 2006). Furthermore, they are net buyers of stocks with positive news shocks because of the attention bias (Barber & Odean, 2008; Hirshleifer, Myers, Myers, & Teoh, 2008). Ideally, arbitrageurs exploit the resultant mispricing to reach an equilibrium, but limited capital in the short run prevents them from eliminating pricing anomalies completely (Frank & Sanati, 2018). As the net market reflects a weighted average of the responses from both types of investors (Bartov, Radhakrishnan, & Krinsky, 2000), the market will show under- or over- reaction depending on whether the retail trading overrides the arbitrageur effect around earnings announcements (Doyle, Lundholm, & Soliman, 2006). The irrational behaviour and attention bias of the retail investors could have consequences for the market response to interim versus annual earnings as I will discuss in detail in the hypothesis development section.

5.3 Hypothesis Development

5.3.1 Australian and U.S. Differences

For several reasons, this Australian research differs from previous research conducted in the U.S. The foremost difference is that Australia has half-yearly reporting instead of quarterly reporting. The advocates of quarterly reporting argue that half-yearly reporting drives investors

to seek alternative sources of information, leading to market overreaction (Arif & De George, 2020), and that quarterly reporting reduces accruals mispricing (Tsao, Lu, & Keung, 2018). Opponents challenge the necessity of quarterly reporting (Schleicher & Walker, 2015) and the excessive managerial myopia it induces (Eaddy, 2019; Kraft, Vashishtha, & Venkatachalam, 2018). This study does not compare the reporting regimes directly but considers their impact on the research question.

Australian firms only report earnings for the first half-year and the annual earnings for the full fiscal year. They do not report results for the second half-year, although this can be deduced by subtracting first half from annual figures. Most U.S. firms, in contrast, file reviewed quarterly reports to the SEC for the first three quarters on Form 10Q and audited annual reports for the full fiscal year on Form 10K. The fourth-quarter earnings are reported as a practice instead of an obligation like for the first three quarters. Therefore, the fourth-quarter earnings result is itself neither audited nor reviewed.

Although earnings announcements in Australia are not as timely as announcements of quarterly earnings in the U.S., they do contain six months of business news (because the last released financial statements were six months prior) as opposed to quarterly earnings that only adds three months of new information. Although the CDR fosters the timely dissemination of material events throughout the year, voluntary disclosures do not necessarily reduce the information content in the annual earnings statement, with CDR impacting half-yearly and annual similarly (Fernando, Giboney, & Schneible, 2018).

In terms of the accounting standards, Australia applies AASB134, the equivalent of IAS34, while the U.S. applies ASC 270. AASB134 regards the interim period (half-year) as a discrete reporting period, so that the reporting entity needs to apply the same accounting policies in its interim financial statements as in the annual statements; this means that the recognition of assets, liabilities, revenues and expenses follows the same principles as in the annual financial

statements. Although some accounts like tax expense need to be estimated (as tax is generally paid on annual income, not double the first-half income), most accruals in interim reports will be determined as if they were for an annual accounting period (e.g., wages expense/payable).

ASC 270 (U.S. GAAP) sees each quarter as an integral part of the fiscal year and some costs can be smoothed over other quarters based on management estimation. Although arbitrary allocation of such costs to an interim period is prohibited, the treatment still allows greater room for discretion in interim quarters, and the fourth-quarter earnings may be contaminated by settling-up effects. Hence, prior literature ascribes the weaker market response to the fourth-quarter earnings to greater noise and less information therein as a result of this settling of the estimation errors in prior interim quarters. Prior U.S. studies mainly examine the integral effect by comparing the first three and the fourth-quarter earnings. The audit effect aims to capture the differential market response to earnings associated with different assurance level: review for earnings of the first three quarters and audit for the annual earnings. This hypothesis cannot be directly examined in the U.S. context because fourth-quarter earnings are not audited.

While annual earnings in Australia are audited and are shown to be more reliable and persistent in Chapter 3, the understanding of the relation between the Australian interim and annual earnings cannot be extrapolated to the U.S. As aforementioned, U.S. fourth-quarter earnings results is not themselves audited and are likely to contain more noise unless firms correct the errors and manipulations by restating interim earnings (Durtschi & Easton, 2009). Despite the regulatory differences, the interim earnings of Australia and the U.S. might be similar in practice because the less rigorous external oversight in interim periods in Australia potentially enables manipulation.

The information environments in Australia and the U.S. are clearly different. Australia relies on CDR, which is aimed at reducing information asymmetry between the firm and outsiders, compared to the U.S. Regulation Fair Disclosure (Reg FD) which can be characterised as

aiming to reduce information asymmetry between external parties. The CDR in Australia may compensate for and ameliorate the greater time gap between earnings announcements, but CDR disclosures usually provide a single number and event. Their effect on the yearly/half-yearly financials is often not clear until the release of financial reports.

5.3.2 Market Response to Australian Half-Yearly and Annual Earnings

Although both interim and annual earnings announcements are regular and mandatory disclosures to the market that inform investors about the performance of the reporting entity in the reporting period, I analyse them separately because of inherent differences apart from the length of period covered by them. One key difference is that interim earnings announcements are not audited and a greater level of estimation is required in the interim report (Alves & Teixeira Dos Santos, 2008; Guan et al., 2006; Kajuter et al., 2016a; Lee et al., 2016; Lin & Yen, 2017; Manry et al., 2003). Further, some accruals like wages will on average be the same size regardless of the period length, while the cash payments on average will be directly proportional to the period length. Therefore, the shorter the period, the greater the impact on results from the same dollar amount of accrual management or error.

Prior U.S. studies generate mixed findings because they use the fourth-quarter earnings result that is affected by its interaction with the errors in the prior interim quarters (Kross and Schroeder, 1990; Salamon and Stober, 1994; Kama, 2009; Chen, Jiang, & Zhu, 2022). The research that compares the market response to the interim quarters and the fourth-quarter earnings outside the U.S. yields consistent findings (Alves & Teixeira Dos Santos, 2008; Lee et al., 2016).

In Australia, the annual report is (statutorily) audited while the interim (half-yearly) report is only reviewed by the external auditor. The market reaction to audited earnings is stronger than to reviewed earnings as a result of the increased level of assurance (Lin & Yen, 2017; Manry et al., 2003). This is consistent with credibility theory because the external review provides a

negative assurance and the level of audit procedures is not comparable with a full audit (Baines et al., 2000). The degree of earnings quality improvement from the external review compared to unaudited and unreviewed earnings is found to be minimal (Bédard & Courteau, 2015). Although some ASX-listed firms release preliminary financial results ahead of the annual report and some of the earnings are in the process being audited, they could still reflect the increased credibility. Firms have incentives to include the accurate information in the preliminary annual report because restatement is costly.

Prior findings are mixed because of the competing arguments of integral accounting in the U.S. GAAP and the audit effect. The integral accounting approach does not appropriately describe the relation between Australian interim and annual earnings because AASB134 treats the interim period as a discrete reporting period. The interim report is prepared as if it is an independent reporting period and the frequency of interim reporting does not affect measurement in the annual report. The annual results are immune from errors or manipulations in interim earnings, which suggests a greater market response to annual earnings with less confusion from the settling-up effect. Results from earlier chapters suggest that the interim earnings report is not as reliable and persistent as annual earnings. A greater market response to annual earnings is expected following both credibility theory and the audit effect hypothesis.

Furthermore, there are relatively fewer analysts and arbitrageurs in Australia compared to America. Many retail investors do not follow company disclosures continuously and mainly react on an interval basis, associated with annual earnings or with media attention. This means that annual earnings in Australia still convey a significant amount of information to the market. The hypothesis is stated in the null form

H5a: Market response to annual earnings announcements is not different from the market response to interim earnings announcements.

Firm size could be an important element in the comparison. On one hand, the difference might be more pronounced for small firms because the interim earnings quality of small firms is relatively lower. Interim earnings of large firms are expected to be of relatively higher quality as a result of stronger internal and external monitoring (Lee et al., 2016). Auditors of large firms are "in residence" (Kross & Schroeder, 1990). According to practitioners, auditors of big firms conduct a partial audit in interim periods to avoid repetitive work at the end of the financial year. The difference between interim and annual earnings quality is found in Chapter 3 to be more pronounced for small firms, which indicates greater difference in market response if the earnings quality difference is reflected by the market response. In contrast, the difference in the information environment in capital markets could also have an impact on the comparison. Compared to the U.S., more firms listed on the ASX are smaller, and their earnings announcements do not evoke a discernible market response. This suggests a less significant or an insignificant difference for small firms due to the lack of attention and market response to earnings announcements.

H5b: The stronger market response to annual earnings announcements is not different between small and large firms.

5.3.3 Market Response to Good News and Bad News of Australian Interim Earnings

The asymmetric market response to good news and bad news is well documented in the literature and various explanations are proposed. Credibility theory and the bad news deferral argument are the common explanations of the asymmetric market response to good news and bad news in interim versus annual earnings. Investors are aware of managers' reluctance to make a timely disclosure of bad news in interim periods (Kothari et al., 2009), so bad news being revealed has more credibility to investors than the more common result of good news (Jeter & Shivakumar, 1999; Mendenhall & Nichols, 1988a). A related argument is that the market reaction is also determined by the surprise relative to peer firms (Lee, 2017). Market

response to bad news will be stronger/more negative if peer firms are reporting good news in interim periods. In the meantime, the market response to annual good news is stronger than to interim good news because of greater perceived credibility of the annual report (Demski & Feltham, 1994).

The bad news deferral argument could be challenged in Australia because of the CDR. Management's ability to withhold bad news in interim earnings announcements is restrained because events that have a material impact on the share price are required to be disclosed in a timely manner. This does not necessarily indicate that the Australian results are different from the U.S. because other mechanisms apply there for keeping the market informed on a timely basis. The Securities Act of 1934 requires firms to disclose material corporate events by filing Form 8-K with the SEC within four business days after their occurrence and Reg FD ensures the equal communication of the information among investors (Li & Tan, 2022). Greater analyst coverage and the fact that the earnings of U.S. firms are reviewed more frequently also stifles the effect of bad news deferral. Therefore, the Australian and U.S. contexts might not be very different in this regard.

However, different characteristics of the participants in the U.S. and Australian stock markets might have an impact on the research question. Retail investors account for a large percentage of Australia's stock market participants (Tsiaplias, Zeng, & Lim, 2023). These investors do not actively trade on new information continuously but mainly trade on attention or news. It follows that relatively fewer retail investors trade on interim earnings and relatively more investors trade on annual earnings, because retail investors are more familiar with the concept of annual earnings and the media pays more attention to annual earnings. In other words, relatively more arbitrageurs trade on interim earnings reports in Australia.

Retail investors tend to overreact to good news and underreact to bad news (Benos, 1998; Daniel et al., 1998; Gervais & Odean, 2001; Hirshleifer et al., 2008). Since the market response

is the net result of the responses from both groups, the market will overreact to annual good news and underreact to annual bad news because of the greater participation of retail investors and the capital constraints of the arbitrageurs which stops them from fully offsetting the mispricing. Therefore, the market response to interim bad news may be greater than to annual bad news and the market response to interim good news may be less strong compared to the annual good news. The difference, if there is any, should be more pronounced in Australia as the U.S. stock market is arguably more efficient. The hypotheses are stated in the null form:

H6a: Market response to interim bad news is not different from the market response to annual bad news.

H6b: Market response to annual good news is not different from the market response to interim good news.

5.3.4 Comparison Issue

The market response to the second half-year earnings is not available in Australia because, after the end of the second half-year, only annual financial statements are released, and they contain substantially more information than the first half-year results and are audited. Generating the second half-year earnings by subtracting the interim earnings from the annual earnings seems to be plausible, but it is not as straightforward because of the inherent differences between interim and annual earnings. Interim earnings is a less accurate number because the calculation of some interim line items is not complete – for example, tax expenses, write-offs and adjustments are only required annually. The level of financial report preparation effort for the interim report is also not as extensive as for the annual report.

The new content in annual earnings includes not only the earnings news of the second half-year, but also the increased credibility of interim earnings that is part of annual earnings. Hence, the calculated second half-year earnings itself does not reflect the quality of audited annual

earnings because it is a mix. Although the inferred second half-year earnings could be argued to be similar to the fourth-quarter earnings in that both are affected by errors in interim earnings, they are fundamentally different because the second half-year earnings is not reported. It is not manipulated nor polished or in other ways 'adjusted' as there is no concern for its signalling effect.

In Australia, comparing the market response to the first and the second half-year is not ideal because the market response to the second half-year is not observable and the inferred second half-year earnings figure is problematic as enunciated above. In contrast, there is a concern that comparing annual earnings with half-year earnings directly does not fully account for the fact that the information in the interim report is known to the market at the time of the annual earnings announcement. There is no perfect solution to this issue. Therefore, two methods of comparison are employed in this research. The first is to compare the interim earnings and annual earnings directly, but to scale the annual earnings to be comparable with interim earnings. The second method is to compare the interim earnings with the inferred second half-year earnings.

5.4 Sample and Research Design

5.4.1 Sample Selection

The main sample comprises 887 firms for the period 2005 to 2018. Market data are derived from SIRCA and include the earnings announcement date, daily stock price and market return. Financial data including earnings, market capitalisation and industry information are derived from Morningstar Datanalysis. The sample includes observations with available data and matching interim/annual observations within a financial year. The sample comprises 10,268 earnings announcements, that is 5,134 firm-year observations with interim and annual earnings announcements in each year.

Table 1 Panels A and B provide the distribution of the observations by industry and year. The firms in Materials (33.09%), Financials (10.89%), Energy (10.36%) and Industrials (10.3%) sectors account for the majority of the sample, followed by Consumer Discretionary (7.91%) and Health Care (7.91%) firms. The number of observations increases gradually by year[12] from 420 (4.09%) in 2005 to 1020 (9.93%) in 2018.

5.4.2 Research Design

The market response to the earnings announcement is represented by the three-day cumulative abnormal return (CAR_{it}) from day (t-1) to day (t+1) with t as the earnings announcement date. The abnormal daily return is the difference between the actual daily return and the normal (expected) daily return determined by the market and risk adjusted returns model (Sharpe, 1964; van Huffel, Joos, & Ooghe, 1996):

$$E(R_{i,t}) = a_i + b_i R_{m,t} \qquad (1)$$

where $E(R_{i,t})$ is the expected daily return of firm i on day t; a_i and b_i are OLS estimators of the firm-year regression where t is the earnings announcement date and $R_{m,t}$ is the value-weighted average of market return on day t.

Using a seasonal random walk model from prior literature (Alwathnani et al., 2017; Lee et al., 2016), the earnings surprise is the seasonally differenced earnings per share before adjustments scaled by the stock price on the first trading day of the reporting period. A measure using the difference from analyst forecasts is not used in the main analysis because the availability of analyst forecasts is limited for interim earnings in Australia. Thus, the degree of interim earnings surprise produced by an announcement is derived from the difference between the

[12] Survivorship is not a concern here. The results for firms that stay listed in 2018 are qualitatively similar to the main sample.

current earnings per share (EPS) and the EPS of the first half-year of the previous fiscal year. Annual earnings surprises are measured in two ways, as discussed in the previous section. First, the difference between the current annual EPS and the annual EPS from the previous fiscal year is generated, which is divided by two to be comparable with the interim earnings surprises. The other measure is based on the inferred second half-year earnings. Naturally, the second half-year earnings is generated by subtracting the first half-year earnings from the annual earnings, hence the second half-year earnings surprise is the difference between the inferred second half-year earnings of the current and previous fiscal years.

H5 is tested using the Ordinary Least Squares (OLS) regression:

$$CAR_{it} = \alpha_0 + \alpha_1 UE_{it} + \alpha_2 INT + \alpha_3 UE_{it} \times INT + \alpha_4 Size + \alpha_5 June + \alpha_6 Size \times UE + \alpha_7 June \times UE + \varepsilon \quad (2)$$

The hypothesis focuses on whether the market in Australia responds to interim earnings differently to its response to annual earnings. The dependent variable is the three-day *CAR* as defined above. *UE* is the seasonally differenced *EPS* scaled by stock price. *INT* is an indicator variable, set to 1 for observations of interim periods and 0 for observations of annual periods. The coefficient α_3 for the interaction between *UE* and *INT* is the test coefficient for H5. It is expected to be significantly negative if the market response to an interim earnings surprise is less strong than to an annual earnings surprise. *Size* is the natural log of total assets and *June* is an indicator variable set to 1 for observations with fiscal year-end in June and 0 for observations with fiscal year-end in other months. *June* is included in the model to control for the fiscal year-end effect. Firms with fiscal year ends in June and in other months may exhibit systematic differences, which are further investigated in section 6.5.2. (Lee et al., 2016; Smith & Pourciau, 1988). Evidence suggests that the choice of fiscal year ends could be associated with different earnings-return patterns (Dierker, Kim and Park, 2019).

Hypotheses 2a and 2b examine whether the market response to an interim versus an annual earnings surprise is contingent on the direction of the earnings surprise. A positive earnings surprise is good news and a negative earnings surprise is bad news. H6a and H6b are tested separately in the good news and bad news subsamples using equation (2). The coefficient on the interaction term UE×INT α_3 is expected to be significantly negative for the good news subsample, following H6a, that the market response to interim good news is not as strong as the market response to annual good news. The coefficient α_3 is expected to be significantly positive for the bad news subsample, following H6b, that the market response to interim bad news is stronger than the market response to annual bad news.

5.5 Empirical Results

Table 2 Panel A presents the descriptive statistics for the annual and interim subsamples. The average of annual EPS is positive and interim EPS is negative. The averages of cumulative abnormal return (CAR) around the interim and annual earnings announcements are close to 0 with the annual CAR higher than the interim (t = 2.8086, p = 0.0050). 83.41% of the firms in the sample have a fiscal year-end of 30 June. In Panel B, CAR is negatively correlated with INT suggesting that interim CAR is smaller than annual CAR. Firms with financial year-end in June (other months) are smaller (larger) with lower (higher) unexpected earnings.

Table 3 and Table 4 present results for H5a and H5b. The only difference between the two is that Table 3 uses scaled annual earnings and Table 4 uses inferred second half-year earnings. The first column in Tables 3 and 4 shows the results for the entire sample, and neither coefficient on *UE×INT* is significant, indicating that the market response to interim and annual earnings surprises is not significantly different for the entire sample despite the choice of measurement. Therefore, H5a cannot be rejected. In H5b, I further investigate whether the result is different for firms of different size because firm size plays an important role in relative quality of interim earnings and capital market environment (Kross & Schroder, 1990; Salamon

& Stober, 1994; Lee et al, 2016). The sample is partitioned into quartiles based on market capital value. Columns (2) to (5) in Tables 3 and 4 present the results for firms from Q1 to Q4 respectively with Table 3 using the scaled annual earnings and Table 4 using the inferred second half-year earnings as before. The coefficient of interest α_3 on the interaction term *UE×INT* is significantly negative only for firms in the top quartile in column (5) in Table 3 (α_3= -0.0004, p = 0.03) and Table 4 (α_3= -0.0012, p = 0.00) suggesting that the market response to interim earnings is less strong only for large firms. Table 4 Panel B presents the average trading activity for firms from quartile 1 to quartile 4. The trading volume for firms in quartile 4 is more than three times higher than the trading volumes for firms from the first three quartiles. The trading value for firms in quartile 4 is 28 times greater than that in quartile 3 and 157 times greater than that in quartile 2. A similar disparity is observed in the trading count, with quartile 4 firms experiencing more than ten times the trading count compared to firms in the earlier quartiles. It seems that investors do not pay as much attention to information about small firms as large firms.

Tables 5 and 6 report my results on investigation into H6 – the responses to good news and bad news. Given that there is no difference in the market response for small firms, the results in Tables 5 and 6 on H6a and H6b are only for large firms, from the top quartile by size. As before, the only difference between the two tables is that Table 5 uses scaled annual earnings and Table 6 uses inferred second half-year earnings. Column (1) presents the results for H6a on the comparison of market responses to interim and annual good news. The coefficient of interest α_3 is significantly negative in both Table 5 (α_3= -0.0009, p = 0.01) and Table 6 (α_3= -0.0012, p = 0.01), indicating that the market response to interim good news is less strong compared to annual good news. Column (2) presents the results for H6b on the comparison of the market response to interim and annual bad news. The coefficient α_3 on *UE×INT* is significantly

positive in both Table 5 (α_3= 0.0275, p = 0.03) and Table 6 (α_3= 0.0351, p = 0.00), indicating that the market response to interim bad news is stronger than to annual good news.

The findings are consistent with predictions, using the bad news deferral argument, that investors react more strongly to annual good news and to interim bad news. If managers are perceived to defer bad news in interim periods, the interim good news is relatively less credible compared to annual good news, and interim bad news is relatively more credible. The argument on the participation of retail investors also predicts greater market response to annual good news and interim bad news. However, this is less likely to be the explanation, considering that H6a and H6b are tested within the largest firms with high institutional ownership, so the behavioural bias of retail investors would have little influence. Although CDR in Australia is expected to restrain bad news deferral, it might not be well enough enforced to eliminate its impact. In the following section, additional tests are conducted to investigate the sensitivity of the results using alternative measures and different subsamples.

5.6 Additional Tests

5.6.1 Alternative explanation on H6 - behavioural bias of retail investors and short-sale constraints

This section examines whether retail investors' over/under-reaction to good/bad news and short-sale constraints of the institutional investor are explanations for the differential market response to interim and annual bad news. For firms in the top size quartile, I divide the observations with institutional ownership data into two groups – high and low institutional ownership subsamples partitioned at the median. If the greater market response to interim bad news is a result of retail investors under-reacting to bad news and their dominance in annual earnings trading, the effect should only be significant for firms with low institutional ownership. That is, the coefficient on the interaction *UE*×*INT* should be positive for the low institutional ownership subsample only. The difference should not be significant for firms with high

institutional ownership because there a lower percentage of retail investors is trading, and mispricing can be eliminated.

The data is derived from SIRCA. There are 1,313 observations within the 2,558 top quartile observations that have institutional ownership information. Table 7 columns (1) and (2) report the results for those reporting good news, with column (1) for the low institutional ownership subsample and column (2) for high institutional ownership subsample. Contrary to the prediction, the coefficient is significant for the high institutional ownership subsample but not for the low institutional ownership subsample. For those reporting bad news, shown in columns (3) and (4), the coefficients are significant for both subsamples of high and low institutional ownership. The results are not consistent with the explanations of retail investors' biased reaction and short-sale constraints of institutional investor. These results indicate that these alternative explanations are not supported.

5.6.2 Timing of the Fiscal Year-End

In this section, I examine whether the main findings vary with the timing of the fiscal year-end. The timing of the fiscal year-end can have an impact on the analysis if firms with different fiscal year-ends systematically exhibit different characteristics. The regular fiscal year-end in Australia is 30th June to align with the national tax period (Lu, Saune, & Shan, 2013). Contrary to the findings in prior research conducted over 20 years earlier, firms with other fiscal year-ends in this sample are larger in size (Huberman & Kandel, 1989; Smith & Pourciau, 1988). Of the entire sample, 83.41% of firms have a June fiscal year-end, while the proportion is 71.70% for large firms (i.e. in the top quartile). This suggests that overall, large firms are more likely to have fiscal year-ends in other months. However, within the top quartile, firms with a fiscal year-end in June have slightly higher market capitalisation with an average of $4,910,000,000 compared to firms with other fiscal year-ends at $3,960,000,000 ($t = 1.7525$, $p = 0.0798$). For firms in the top quartile, 24.05% of the firms with June fiscal year-end are dual-listed compared

to 19.75% of the firms with other year-ends, which means that the choice of other fiscal year-ends is not a result of being dual-listed. Firms with other fiscal year-ends tend to be older (36 years versus 29 years since listed).

Table 8 Columns (1) and (2) present results for the subsample with fiscal year-end in June and Columns (3) and (4) present results for the subsample with other fiscal year-ends. The results for the June subsample are consistent with the main results. For the non-June subsample, the result is not significant for bad news. On one hand, the insignificance may be a result of the limited sample size because the firms with other fiscal year-ends and bad news is the smallest subsample. In contrast, it could be related to the information environment. Investors could be more alert during the main reporting period and respond in a more timely manner. There might be less attention on earnings reported outside the reporting period unless the firm is economically significant, causing the results to be less significant.

5.6.3 Sensitivity Tests on H6

In this section, the robustness of the findings from the main analysis is tested using the research designs of Mendenhall and Nichols (1988a) and Mian and Sankaraguruswamy (2012). The estimation models in these studies are slightly different from the ones used in this chapter, but the ideas are similar. Mendenhall and Nichols (1988a) include a variable that represents interim bad news directly in the model. Mian and Sankaraguruswamy (2012) use a triple interaction term. The model includes interactive variables between unexpected earnings and indicator variables that represent good/bad news. They are multiplied with the interim indicator variable to capture the marginal difference.

Table 9 column (1) reports the results following Mendenhall and Nichols (1988a). Consistent with the main findings and the bad news deferral argument, the market response to interim bad news is significantly stronger compared to its response to annual bad news (d1×UE, b_2 = 0.0269, p = 0.001). Table 9 column (2) presents the results following Mian and

Sankaraguruswamy (2012) which are consistent with prior results: the market response is stronger for interim bad news (UEdown×Int, γ_1=0.0378, p = 0.00). Therefore, the stronger market response to interim bad news is not sensitive to different research designs.

In contrast, the coefficient that captures the differential market response to interim and annual good news is significantly negative in the Mian and Sankaraguruswamy (2012) model (UEUp×Int, β_1 = -0.0010, p = 0.014), suggesting a less strong market response to interim good news compared to annual good news. The market responses to interim and annual good news are not significantly different in the main test but became significant with different research designs and sample sizes. A market response to interim good news might be smaller than to annual good news, for example, but it is not a robust difference.

5.6.4 Alternative Measure of Earnings Surprise

Earnings surprise is measured using a time-series approach as the difference between the current earnings per share (EPS) and the EPS from the corresponding period in the last fiscal year. Another measure of the earnings surprise is the difference between the actual result and the analyst forecast. Although this measure is adopted in most research, I do not use it here because it decreases the sample size substantially. Analyst coverage for ASX-listed firms is much lower than for U.S. firms, especially for interim earnings. Only a limited number of firms have analyst forecasts on interim earnings and the average number of forecasts for those firms is 2.58. This casts doubt on the usefulness of the average analyst forecast as a measure of earnings expectation.

Nevertheless, in this section the market response to interim and annual earnings with the alternative measure of earnings surprise is examined. The earnings surprise is defined as the difference between the actual EPS and the average analyst forecast EPS:

$$UE = \frac{Actual\ EPS - Average\ analyst\ forecast}{Begining\ of\ the\ reporting\ period\ share\ price}$$

The average analyst forecast is determined as the average of all analyst forecasts in the I/B/E/S database prior to the earnings announcement date and after the release of the previous earnings announcement. Actual EPS are also derived from the I/B/E/S summary file. The earnings surprise is scaled by the share price on the first trading day of the reporting period. The final sample includes 326 firm-year observations. Table 10 reports the results that are largely insignificant. I repeat the test using the same sample size randomly selected from the main sample and the results are once again insignificant. This shows that the limited sample size might explain the insignificant results.

5.6.5 Ball and Shivakumar Model

Ball and Shivakumar (2008) and Taylor and Tong (2023) examine the relative importance of earnings to other information sources in terms of the new information provided within the annual share price, which is indicated by the coefficient of determination (R^2) in a regression of calendar-year return on earnings-announcement "window" returns. This model is simple, and does not limit the sample size because earnings expectations are not required. Different from prior research that investigates whether earnings are important to the market, I compare the relative importance of interim and annual earnings. Hence, the calendar-year return is regressed with the returns for interim and annual earnings announcements windows separately, and the comparison is made between the adjusted R^2s from the two regressions. As shown in Table 11, the adjusted R^2 is 0.0438 for the annual regression and 0.0005 for the interim regression. This means that annual earnings provide more information to the annual share price report compared to interim earnings.

5.6.6 Sensitivity Tests on Firm-Year Observations Without Preliminary Annual Earnings Announcements

As aforementioned, some ASX-listed firms release preliminary financial results that are being audited. This could affect the results if the market response to preliminary financial results is

smaller than the response to actual financial results, while having no effect on the market response to interim earnings. This could bias the results towards showing an insignificant difference between market response to interim and annual earnings announcements. Therefore, in this section, I exclude the firm-year observations with preliminary earnings announcements and repeat the tests. The results are presented in Table 12, and they are qualitative similar to the main results, suggesting that this is not a major concern for the findings.

5.7 Conclusion

This chapter predicted and found a less strong market response to half-yearly earnings compared to annual earnings in Australia, for large firms only. This research is distinguished from prior studies in several respects because of the uniqueness of the Australian setting for interim reporting. For example, in Australia there is only one reviewed interim (half-yearly) earnings and audited annual earnings each year with which to examine the market response as opposed to the market response to interim, fourth-quarter and annual earnings examined in U.S. studies. Moreover, I find a greater market response to annual good news compared to interim good news, as well as a greater market response to interim bad news compared to annual bad news for large firms, potentially related to the bad news deferral implemented by management. The findings are also robust to different research designs.

The present research design has several limitations. The time-series model is used to determine the earnings surprise, while the alternative measure, using the I/B/E/S analyst forecasts, does not corroborate with the main results and is likely less reliable due to sample attrition. Also, both scaled annual measures and the second half-year measure are adopted as none of them is a perfect proxy of the examined issue. There is no market response to second half-year earnings and the inferred second half-year earnings do not represent the nature and quality of the annual earnings because it is affected by the estimations in the interim earnings. The scaled annual earnings result, however, does not incorporate the fact that information related to interim

earnings is known to the market. This is a limitation of the research context, and both measures are consequently examined to mitigate the concern.

Furthermore, the capital market is affected by multiple factors such as media coverage, analysts' information, management disclosures, informal online information, peer firm information and level of compliance with both the letter and spirit of the CDR. Only the news inherent in earnings is examined in this research. Future research can examine the different components of the information environment on the interim and annual earnings and their impact on market responses. Other issues not incorporated in this study might also be interesting for future research, for example, the influence of algorithm trading on the market response.

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Table 1

Panel A: Distribution of Observations by Industry

GICS code	Sector description	Observations	Percentage
10	Energy	1,064	10.36%
15	Materials	3,398	33.09%
20	Industrials	1,058	10.30%
25	Consumer Discretionary	812	7.91%
30	Consumer Staples	368	3.58%
35	Health care	812	7.91%
40	Financials	1,118	10.89%
45	Information Technology	716	6.97%
50	Communication Services	214	2.08%
55	Utilities	202	1.97%
60	Real Estate	506	4.93%
	Total	10,268	100.00%

Panel B: Distribution of observations by year

Year	Observations	Percentage
2005	420	4.09%
2006	522	5.08%
2007	568	5.53%
2008	512	4.99%
2009	746	7.27%
2010	792	7.71%
2011	734	7.15%
2012	766	7.46%
2013	746	7.27%
2014	732	7.13%
2015	778	7.58%
2016	932	9.08%
2017	1000	9.74%
2018	1020	9.93%
Total	10268	100.00%

This table reports the sample selection and distribution. Panel A reports the sample distribution by GICS industry sector and Panel B reports the sample distribution by year.

Table 2 Descriptive statistics and Correlations

Panel A: descriptive statistics

	Annual (N = 5,134)			Interim (N = 5,134)		
Variables	Mean	Median	Std Dev	Mean	Median	Std Dev
EPS	1.8804	0.0013	92.4399	-0.2935	0.0040	85.9762
EPS_change	0.5029	0.0041	153.2237	0.6135	0.0016	98.9544
Unexpected earnings	26.3241	0.0066	1379.013	10.9733	0.0024	801.2317
UE	13.1620	0.0033	689.5066	10.9733	0.0024	801.2317
UE_SH	4.2296	0.0045	1951.587	10.9733	0.0024	801.2317
CAR	0.0060	0.0020	0.1123	0.0000	0.0013	0.1058
June	0.8341	1	0.3720	-	-	-
Market capitalisation	1,220,000,000	98,300,000	6,290,000,000	1,260,000,000	110,000,000	6,690,000,000

Panel B: Pearson Correlation

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
CAR (1)	1				
UE (2)	-0.0083	1			
INT (3)	-0.0277***	-0.0068	1		
June (4)	0.0071	-0.0403***	-0.0003	1	
Size (5)	-0.0081	0.0019	0.0217**	-0.1849***	1

Panel A of this table reports the summary statistics of the main sample separately for interim and annual observations. All continuous variables except for stock returns are winsorised at the 1st and 99th percentiles. Panel B reports the Pearson correlations. *** represents significance level of 1%, using two-tailed p-values.

Table 3

Comparative market response to Interim vs Annual earnings and size effect

	(1)	(2)	(3)	(4)	(5)
	CAR	**CAR**	**CAR**	**CAR**	**CAR**
		Q1	**Q2**	**Q3**	**Q4**
UE	-0.0000	-0.0001**	0.0000*	-0.0000	0.0004**
	(0.97)	(0.05)	(0.07)	(0.78)	(0.02)
INT	-0.0236	-0.0739	-0.0079	-0.0408	-0.1383**
	(0.26)	(0.61)	(0.97)	(0.74)	(0.01)
UE×INT	-0.0000	-0.0001	-0.0000	-0.0000	-0.0004**
	(0.32)	(0.46)	(0.12)	(0.21)	(0.03)
size	-0.0009	-0.0047	0.0026	0.0048	-0.0040**
	(0.20)	(0.43)	(0.73)	(0.31)	(0.02)
sizeXUE	0.0013	0.0059	0.0007	0.0019	0.0061**
	(0.23)	(0.50)	(0.95)	(0.76)	(0.01)
June	0.0051	0.0264*	0.0053	-0.0003	0.0005
	(0.23)	(0.09)	(0.54)	(0.96)	(0.89)
JunexUE	-0.0070	-0.0343	-0.0119	-0.0020	0.0046
	(0.24)	(0.12)	(0.34)	(0.81)	(0.41)
Cons	0.0194	0.0630	-0.0475	-0.0877	0.0918**
	(0.19)	(0.52)	(0.73)	(0.33)	(0.02)
N	10268	2567	2567	2567	2567
Adjusted R^2	0.0006	0.0026	-0.0004	0.0063	0.0079

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.

This table shows test results on the differential market response to interim and annual earnings surprises. Column (1) presents the results on the full sample. Column (2) to (5) present the results for each quartile of the sample partitioned on firm size. The estimation model is equation (2):

$$\boldsymbol{CAR_{it} = \alpha_0 + \alpha_1 UE_{it} + \alpha_2 INT + \alpha_3 UE_{it} \times INT + \alpha_4 Size + \alpha_5 June + \alpha_6 Size \times UE + \alpha_7 June \times UE + \varepsilon}$$

Where:

CAR = the cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date.

UE = unexpected earnings of the half-year/ full fiscal year following seasonal random walk which is the difference between the current half-year/ annual earnings per share and the half-year/ annual earnings per share of the last fiscal year.

INT = Indicator variable coded as 1 for interim periods and 0 for annual periods

Size = The natural log of the market capital

June = Indicator variable coded as 1 for firms with fiscal year end in June and 0 for firms with fiscal year end in other months

Table 4 Comparative market response to Interim vs second half-year earnings and size effect

	(1)	(2)	(3)	(4)	(5)
	CAR	**CAR**	**CAR**	**CAR**	**CAR**
		Q1	**Q2**	**Q3**	**Q4**
UE_SH	-0.0001**	-0.0005	-0.0000	-0.0000	-0.0157***
	(0.03)	(0.32)	(1.00)	(0.32)	(0.00)
INT	-0.0060***	-0.0097	-0.0054	-0.0051*	-0.0034
	(0.01)	(0.13)	(0.20)	(0.09)	(0.18)
UE_SH×INT	-0.0000	-0.0001	-0.0000	-0.0000	-0.0012***
	(0.21)	(0.55)	(0.75)	(0.17)	(0.00)
size	-0.0003	-0.0021	0.0032	0.0058*	-0.0010
	(0.51)	(0.63)	(0.55)	(0.07)	(0.40)
UE_SH×size	0.0000**	0.0000	0.0000	0.0000	0.0008***
	(0.04)	(0.42)	(0.99)	(0.35)	(0.00)
June	0.0017	0.0091	-0.0011	-0.0010	0.0027
	(0.56)	(0.40)	(0.86)	(0.82)	(0.34)
UE_SH×June	0.0000	0.0001	0.0000	0.0003**	-0.0013
	(0.52)	(0.50)	(0.74)	(0.01)	(0.70)
Cons	0.0110	0.0367	-0.0520	-0.1062*	0.0253
	(0.30)	(0.61)	(0.59)	(0.09)	(0.35)
N	10268	2567	2567	2567	2567
Adjusted R^2	0.0012	0.0027	-0.0016	0.0100	0.0057

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.

This table shows test results on the differential market response to earnings surprises of the first and the second half-year. Column (1) presents the results on the full sample. Column (2) to (5) present the results for each quartile of the sample partitioned on firm size. The estimation model is equation (2):

$$\boldsymbol{CAR_{it} = \alpha_0 + \alpha_1 UE\_SH_{it} + \alpha_2 INT + \alpha_3 UE\_SH_{it} \times INT + \alpha_4 Size + \alpha_5 June + \alpha_6 Size \times UE + \alpha_7 June \times UE + \varepsilon}$$

Where:

CAR = the cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date.

UE_SH = unexpected earnings of the first and second half-year following seasonal random walk which is the difference between the current half-year/ annual earnings per share and the half-year/ annual earnings per share of the last fiscal year.

INT = Indicator variable coded as 1 for interim periods and 0 for annual periods

Size = The natural log of the market capital

June = Indicator variable coded as 1 for firms with fiscal year end in June and 0 for firms with fiscal year end in other months

Panel B Average Trading Activities for Firms in Different Size Quartiles

	(1)	(2)	(3)	(4)
	Q1	**Q2**	**Q3**	**Q4**
Trading Volume	1,475,924	1,235,117	1,280,930	4,457,219
Trading Value	380,872	164,078	934,878	25,800,000
Trading count	30	39	272	3,877

Table 5 Comparative market response to good news and bad news in interim and annual earnings for large firms

	(1)	(2)
	CAR	**CAR**
	Good news	**Bad news**
UE	-0.0242***	-0.4230**
	(0.00)	(0.01)
INT	-0.0002	-0.0050
	(0.95)	(0.24)
UE×INT	-0.0009***	0.0275**
	(0.01)	(0.03)
size	-0.0018	0.0001
	(0.24)	(0.95)
size×UE	0.0011***	0.0206**
	(0.00)	(0.01)
June	0.0010	0.0012
	(0.79)	(0.79)
June×UE	0.0061	-0.0143
	(0.46)	(0.22)
Cons	0.0468	-0.0041
	(0.17)	(0.93)
N	1567	1000
Adjusted R^2	0.0089	0.0203

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.

This table shows test results on the differential market response to earnings surprises in interim and annual periods. Column (1) and (2) present the results on the good news and bad news respectively. The estimation model is equation (2):

$$\boldsymbol{CAR_{it} = \alpha_0 + \alpha_1 UE_{it} + \alpha_2 INT + \alpha_3 UE_{it} \times INT + \alpha_4 Size + \alpha_5 June + \alpha_6 Size \times UE + \alpha_7 June \times UE + \varepsilon}$$

Where:

CAR = the cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date.

UE = unexpected earnings of interim/annual earnings following seasonal random walk which is the difference between the current half-year/ annual earnings per share and the half-year/ annual earnings per share of the last fiscal year.

INT = Indicator variable coded as 1 for interim periods and 0 for annual periods

Size = The natural log of the market capital

June = Indicator variable coded as 1 for firms with fiscal year end in June and 0 for firms with fiscal year end in other months

Table 6 Comparative market response to good news and bad news in interim and second half-year earnings for large firms

	(1)	(2)
	CAR	**CAR**
	Good news	**Bad news**
UE_SH	-0.0240***	-0.2032*
	(0.00)	(0.06)
INT	-0.0003	-0.0040
	(0.92)	(0.34)
UE_SH×INT	-0.0009**	0.0351***
	(0.01)	(0.00)
size	-0.0020	0.0000
	(0.20)	(1.00)
UE_SH×size	0.0011***	0.0099*
	(0.00)	(0.06)
June	0.0015	0.0008
	(0.67)	(0.86)
UE_SH×June	-0.0042	-0.0161***
	(0.39)	(0.00)
Cons	0.0506	-0.0024
	(0.13)	(0.96)
N	1567	1000
Adjusted R^2	0.0090	0.0226

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.

This table shows test results on the differential market response to earnings surprises for the first and the second half-year earnings. Column (1) and (2) present the results on the good news and bad news respectively. The estimation model is equation (2):

$$\boldsymbol{CAR_{it} = \alpha_0 + \alpha_1 UE\_SH_{it} + \alpha_2 INT + \alpha_3 UE\_SH_{it} \times INT + \alpha_4 Size + \alpha_5 June + \alpha_6 Size \times UE\_SH_{it} + \alpha_7 June \times UE\_SH_{it} + \varepsilon}$$

Where:

CAR = the cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date.

UE_SH = unexpected earnings of the first and second half-year following seasonal random walk which is the difference between the current half-year/ annual earnings per share and the half-year/ annual earnings per share of the last fiscal year.

INT = Indicator variable coded as 1 for interim periods and 0 for annual periods

Size = The natural log of the market capital

June = Indicator variable coded as 1 for firms with fiscal year end in June and 0 for firms with fiscal year end in other months

Table 7
Subsample analysis on institutional ownership

	(1) CAR Low Institutional ownership Good news	(2) CAR High Institutional ownership Good news	(3) CAR Low institutional ownership Bad news	(4) CAR High institutional ownership Bad news
UE	-0.0251	0.5335	0.7281	-0.9209
	(0.91)	(0.39)	(0.15)	(0.22)
INT	-0.0017	-0.0023	-0.0044	0.0028
	(0.78)	(0.71)	(0.58)	(0.76)
UE×INT	-0.0008	-0.0570**	0.0934**	0.1845***
	(0.87)	(0.04)	(0.02)	(0.00)
size	-0.0018	-0.0002	-0.0021	0.0034
	(0.57)	(0.96)	(0.57)	(0.55)
size×UE	0.0012	-0.0225	-0.0354	0.0349
	(0.91)	(0.43)	(0.15)	(0.32)
June	-0.0110	0.0001	-0.0072	0.0235**
	(0.13)	(0.98)	(0.41)	(0.01)
June×UE	0.1545***	-0.0269	0.0590	0.1724***
	(0.00)	(0.56)	(0.27)	(0.00)
Cons	0.0543	0.0155	0.0503	-0.0870
	(0.43)	(0.83)	(0.53)	(0.47)
N	418	386	243	273
Adjusted R^2	0.0859	-0.0029	0.0687	0.1274

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.

This table shows the results on the subsample analysis of the differential market response to earnings surprises in interim and annual earnings. The sample in this test comprises the firms with size in the top quartile, and Column (1) and (2) present the results for firms with high and low institutional ownership respectively. The estimation model is equation (2):

$$\boldsymbol{CAR_{it} = \alpha_0 + \alpha_1 UE\_SH_{it} + \alpha_2 INT + \alpha_3 UE\_SH_{it} \times INT + \alpha_4 Size + \alpha_5 June + \alpha_6 Size \times UE + \alpha_7 June \times UE + \varepsilon}$$

Where:

CAR = the cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date.

UE_SH = unexpected earnings of the first and second half-year following seasonal random walk which is the difference between the current half-year/ annual earnings per share and the half-year/ annual earnings per share of the last fiscal year.

INT = Indicator variable coded as 1 for interim periods and 0 for annual periods

Size = The natural log of the market capital

June = Indicator variable coded as 1 for firms with fiscal year end in June and 0 for firms with fiscal year end in other months

Table 8
Subsample analysis on fiscal year-end

	(1) CAR June Good news	(2) CAR June Bad news	(3) CAR Non-June Good news	(4) CAR Non-June Bad news
UE_s	-0.0504	-0.7073**	-0.0236***	-0.6795***
	(0.86)	(0.01)	(0.00)	(0.01)
INT	0.0041	-0.0046	-0.0073	-0.0054
	(0.27)	(0.38)	(0.25)	(0.45)
UE×INT	-0.0350**	0.0584***	-0.0009**	-0.0315
	(0.04)	(0.00)	(0.02)	(0.17)
size	-0.0023	-0.0001	-0.0007	0.0029
	(0.20)	(0.96)	(0.84)	(0.46)
size×UE	0.0034	0.0324**	0.0011***	0.0331***
	(0.81)	(0.02)	(0.00)	(0.01)
Cons	0.0559	0.0020	0.0259	-0.0638
	(0.14)	(0.97)	(0.73)	(0.45)
N	1136	700	431	300
Adjusted R^2	0.0061	0.0261	0.0304	0.0340

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.

This table shows the results on the subsample analysis of the differential market response to earnings surprises in interim and annual earnings. The sample in this test comprises the firms with size in the top quartile, and Column (1) and (2) present the results for firms with fiscal year end in June and Column (3) and (4) present the results for firms with fiscal year end in other months. The estimation model is:

$$CAR_{it} = \alpha_0 + \alpha_1 UE\_SH_{it} + \alpha_2 INT + \alpha_3 UE\_SH_{it} \times INT + \alpha_4 Size + \alpha_5 Size \times UE + \varepsilon$$

Where:

CAR = the cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date.

UE_SH = unexpected earnings of the first and second half-year following seasonal random walk which is the difference between the current half-year/ annual earnings per share and the half-year/ annual earnings per share of the last fiscal year.

INT = Indicator variable coded as 1 for interim periods and 0 for annual periods

Size = The natural log of the market capital

Table 9

Sensitivity tests on H6 using research design in prior studies

		(1) CAR			(2) CAR
b_1	**UE**	0.0002**	α_1	**Down**	-0.0122***
		(0.01)			(0.00)
	d1	-0.0047	β_0	**UEUp**	-0.0140
		(0.25)			(0.45)
	d2	0.0093***	β_1	**UEUp×INT**	-0.0010**
		(0.01)			(0.01)
b_2	**d1×UE**	0.0269***	γ_0	**UEDown**	-0.3562***
		(0.00)			(0.01)
b_3	**d2×UE**	-0.0002**	γ_1	**UEDown×INT**	0.0378***
		(0.03)			(0.00)
			β_2	**NonlUp**	-0.0000
					(0.57)
			β_3	**NonlDown**	-0.0000***
					(0.00)
			γ_2	**UEUp×size**	0.0007
					(0.45)
			γ_3	**UEDown×size**	0.0164***
					(0.01)
	Cons	-0.0009	α_0	**Cons**	0.0085***
		(0.74)			(0.00)
	N	2,567		**N**	2,567
	Adjusted R^2	0.0159		**Adjusted R^2**	0.0251

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.

This table shows sensitivity test results on the differential market response to good news and bad news for interim versus annual earnings using research method from prior studies. Column (1) presents the results following (Mendenhall & Nichols, 1988a). Column (2) presents the results following (Mian & Sankaraguruswamy, 2012).

The estimation model for Column (1):

$$CAR_{it} = a + b_1(UE_{it}) + b_2(d_1 UE_{it}) + b_3(d_2 UE_{it}) + \varepsilon_{it}$$

Where:

CAR = the cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date.

UE = unexpected earnings of the half-year/ full fiscal year following seasonal random walk which is the difference between the current half-year/ annual earnings per share and the half-year/ annual earnings per share of the last fiscal year.

d_1= 1 if INT = 1 and UE < 0 and 0 otherwise

d_2= 1 if UE > 0 and 0 otherwise;

The estimation model for Column (2):

$$CAR_{it} = \alpha_0 + \alpha_1 Down_{it} + \beta_0 UEUp_{it} + \beta_1 UEUp_{it} \times INT + \gamma_0 UEDown_{it} + \gamma_1 UEDown_{it} \times INT + \beta_2 NonlUp_{it} + \beta_3 UEUp_{it} Size_{it} + \gamma_2 NonlDown_{it} + \gamma_3 UEDown_{it} Size_{it} + \varepsilon_{it}$$

Where:

CAR = the cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date.

UEUp (UEDown) = product of the unexpected earnings, UE, and the indicator variable, Up (Down), which takes the value of 1 if UE is positive (negative), and 0 otherwise;

NonlUp and NonlDown = square of UEUp and the square of UEDown, respectively, multiplied by -1;

Size = The natural log of the total market capitalization of the firm-year observation.

Table 10
Alternative measure of earnings surprise

	CAR
UE	-0.2299
	(-1.03)
INT	-0.0036
	(-0.82)
UE×INT	0.0231
	(0.69)
size	-0.0016
	(-1.06)
size×UE	0.0081
	(0.80)
LEV	0.0023
	(1.44)
UE×LEV	0.0242
	(1.18)
Cons	0.0348
	(1.15)
N	652
Adjusted R^2	0.0004

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.
This table shows test results on the differential market response to interim and annual earnings surprises. The estimation model is equation (2):
$CAR_{it} = \alpha_0 + \alpha_1 UE_{it} + \alpha_2 INT + \alpha_3 UE_{it} \times INT + \alpha_4 Size + \alpha_5 LEV + \alpha_6 Size \times UE + \alpha_7 LEV \times UE + \varepsilon$
Where:
CAR = the cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date.
UE = unexpected earnings of the half-year/ full fiscal year which is the difference between the actual half-year/ annual earnings per share and the average analyst forecasts.
INT = Indicator variable coded as 1 for interim periods and 0 for annual periods
Size = The natural log of the total asset of the firm-year observation
LEV = total assets / total liabilities

Table 11 Adjusted R^2 from regressions of annual returns on three-day event window returns around interim and annual earnings announcement date

	Adjusted R^2
Annual	0.0438
Interim	0.0005

Table 12

Sensitivity tests on firm-year observations without preliminary earnings announcements

	(1)	(2)	(3)	(4)	(5)
	CAR	**CAR**	**CAR**	**CAR**	**CAR**
		Q1	**Q2**	**Q3**	**Q4**
UE	-0.0001	-0.0011	0.0008	0.0001	-0.0161***
	(0.17)	(0.27)	(0.42)	(0.39)	(0.00)
INT	-0.0059***	-0.0092	-0.0053	-0.0058*	-0.0029
	(0.01)	(0.15)	(0.21)	(0.06)	(0.25)
UE×INT	-0.0000	-0.0001	0.0000	-0.0000	-0.0013***
	(0.26)	(0.50)	(0.97)	(0.35)	(0.00)
size	-0.0004	-0.0019	0.0042	0.0068**	-0.0011
	(0.44)	(0.66)	(0.44)	(0.04)	(0.37)
sizeXUE	0.0000	0.0001	-0.0000	-0.0000	0.0008***
	(0.17)	(0.34)	(0.43)	(0.38)	(0.00)
June	0.0012	0.0098	-0.0007	-0.0016	0.0021
	(0.68)	(0.37)	(0.91)	(0.71)	(0.45)
JunexUE	0.0000	0.0002	-0.0000	-0.0015***	0.0106*
	(0.33)	(0.40)	(0.65)	(0.00)	(0.05)
Cons	0.0125	0.0332	-0.0705	-0.1255**	0.0272
	(0.24)	(0.64)	(0.47)	(0.05)	(0.32)
N	10094	2556	2533	2500	2505
Adjusted R^2	0.0006	0.0026	-0.0004	0.0069	0.0063

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.

This table shows test results on the differential market response to interim and annual earnings surprises for firm-year observations without preliminary annual earnings announcments. Column (1) presents the results on the full sample. Column (2) to (5) present the results for each quartile of the sample partitioned on firm size. The estimation model is equation (2):

$$\boldsymbol{CAR_{it} = \alpha_0 + \alpha_1 UE_{it} + \alpha_2 INT + \alpha_3 UE_{it} \times INT + \alpha_4 Size + \alpha_5 June + \alpha_6 Size \times UE + \alpha_7 June \times UE + \varepsilon}$$

Where:

CAR = the cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date.

UE = unexpected earnings of the half-year/ full fiscal year following seasonal random walk which is the difference between the current half-year/ annual earnings per share and the half-year/ annual earnings per share of the last fiscal year.

INT = Indicator variable coded as 1 for interim periods and 0 for annual periods

Size = The natural log of the market capital

June = Indicator variable coded as 1 for firms with fiscal year end in June and 0 for firms with fiscal year end in other months

Chapter 6

Conclusion

6.1 Overview

Interim reports in Australia are primarily half-yearly reports that deliver earnings updates for the first six months of a company's fiscal year. Despite containing less detailed information and a lower level of assurance, they have the potential to be as important as annual reports (Brown, 1972). The widespread regulatory requirement for interim reporting and frequent modifications of the regulations globally indicate that regulators recognize the value of interim reporting (Kajüter et al., 2021; Mensah & Werner, 2008). Meanwhile, the changes and global variations in interim reporting regulations underscore the need for a greater understanding of the issue and its research opportunities. Australia offers a unique institutional research context for this topic due to the combination of externally reviewed half-yearly reports and the enforcement of its Continuous Disclosure Regime (CDR).

Annual reporting is the most studied topic in accounting research and is reasonably well understood. Interim reporting receives much less attention from researchers, with the result that standard setters, regulators, auditors and investors do not understand what contributes to its usefulness or how it helps investors make decisions with timely information. Given the similarities between interim reporting and annual reporting, this thesis aims to enhance the understanding of interim reporting through a comparison with annual reporting in various aspects. This thesis begins with a general overview of interim reporting, including its concept, historical development, and reporting practices in Australia. It then proceeds with empirical analyses on three fundamental aspects of interim reporting: reporting quality, its association with characteristics of audit committee, and the market response to interim earnings.

Specifically, Chapter 2 introduces the historical development and regulatory requirement of interim reporting in Australia. It also provides a detailed description of the content and other characteristics of interim reports in the Australian context. In Chapter 3, the focus is on the reliability of interim earnings in comparison to annual earnings and its ability to predict annual earnings. Moving on to Chapter 4, this study examines the association between interim earnings quality and audit committee characteristics. Finally, in Chapter 5, the research compares the market response to interim earnings versus annual earnings, as well as the market response to interim good/bad news in comparison to annual good/bad news. The next section will provide a summary of findings from each of these chapters.

6.2 Summary and findings

6.2.1 Chapter 2: Description of Interim Reporting in Australia

The interim report serves as a crucial channel for communicating business performance to investors. In Australia, listed firms, with the exception of mining, gas, and oil companies, are mandated to issue interim reports and register them with ASIC every six months. Notably, the interim reports in Australia must undergo review by external auditors. The Australian accounting standards governing interim reporting, outlined in AASB 134, are an adaptation of the international standard, IAS 34. AASB 134 not only sets forth the minimum content requirements for interim reports but also provides guidance on the measurement of key elements.

In Chapter 2, a pilot sample of 26 firms is examined to analyse the content and other characteristics of interim reports in comparison to annual reports. Interim reports in Australia primarily consist of three parts: director's report, condensed financial statements and auditors' independence and review reports; and that the average length of an interim report is approximately 25% of the annual report, with less than half the number of notes in the interim

financial statement compared to its annual counterpart. Despite the difference in lengths, the average reporting lag for interim reports is surprisingly similar to that of annual reports, and the format of interim reports has remained unchanged since 2012, with only a slight increase in length, approximately four pages. Notably, the communication of Environmental, Social, and Governance (ESG) issues is very limited in interim reports. This descriptive chapter highlights both the importance of the interim report and the inadequacy of what is known about it. laying the groundwork for the following analytical chapters that establish a fundamental understanding of interim reporting in Australia.

6.2.2 Chapter 3: Reliability and indicativeness in interim reporting

Earnings news stands as a central piece of information in financial reports, and the quality of earnings is crucial for investors to analyse and evaluate business news, enabling them to make informed decisions. Reliability and relevance are two fundamental characteristics of earnings quality, and Chapter 3 commences by comparing the reliability of interim earnings to that of annual earnings. Due to less stringent external oversight from auditors and regulators, coupled with the intricate nature of interim measurements and managerial pressure to maintain share prices, interim earnings is expected to be less reliable. The reliability of earnings is assessed using various measures, including accrual measures, smoothness measures, and earnings persistence. In line with expectations, interim earnings is found to be less reliable than annual earnings, with the contrast more pronounced for small firms.

The relevance of interim earnings in indicating annual earnings for the fiscal year is closely tied to the reliability of interim earnings. In this chapter, a measure is proposed to assess the ability of interim earnings to indicate annual earnings, termed “indicativeness.” This measure is modelled as the portion of interim earnings that neither corresponds to annual earnings nor reflects business news in the interim period. The term “indicativeness” is used here to

distinguish the measure from earnings predictability, as interim earnings is a portion of the annual earnings it is indicating. Furthermore, the reliability of the interim earnings result is found to have a positive correlation with the indicativeness of interim earnings. This implies that more accurate and reliable interim earnings results are more valuable in indicating annual earnings.

6.2.3 Chapter 4: Interim reporting quality and audit committee characteristics

Earnings quality can be influenced by both intentional and unintentional errors, and the audit committee is related to both. Within internal governance mechanisms, the audit committee bears direct responsibility for the quality of financial reporting, of which interim reporting is a critical component. This association is expected, as a competent audit committee can provide guidance on the appropriateness of interim measurements and help restrain earnings manipulations. However, the associations between audit committee independence, accounting expertise, gender diversity, and interim earnings quality are not found to be robust. Furthermore, this chapter does not identify robust associations between the examined audit committee characteristics and annual earnings quality when subjected to endogeneity tests.

Corporate governance research faces challenges of endogeneity, as corporate governance is intertwined with other factors that may influence earnings quality. Additionally, while the ASX Corporate Governance Principles and Recommendations (2019) are not binding, the majority of the sample exhibits similarity in the examined audit committee characteristics. These factors present difficulties in establishing a clear understanding of the impact of audit committees on interim reporting. Although the results are statistically insignificant, it would be premature to conclude that the audit committee is not fulfilling its responsibilities. Nevertheless, the findings from Chapter 3 suggest that interim earnings is not as reliable as annual earnings. The audit

committee, with its potential to enhance earnings quality through increased involvement, remains an area for further exploration.

6.2.4 Chapter 5: Stock Market Response to Interim Reporting

Given the role of earnings in informing investors' financial decisions, the examination and understanding of market responses to it are of great importance. This chapter enhances the understanding of interim earnings in Australia by comparing the market response to interim earnings with that of annual earnings. The findings in Chapter 3 indicate that interim earnings is not as reliable as annual earnings, and a smaller market response to interim earnings compared to annual earnings is found in this chapter. Furthermore, the quality gap between interim and annual earnings is found to be greater for small firms in Chapter 3. Contrary to prior findings, the market response comparison is only significant for large firms, potentially due to information environment where earnings of small firms in Australia may not evoke sufficient market response.

This chapter also finds that the market response is greater to annual good news than interim good news, and greater to interim bad news than annual bad news for large firms. The results are more likely to be driven by managerial good news deferral rather than the participation of retail investors and their behavioural bias, as suggested by the analysis. Furthermore, the findings are supported by different research methods.

This chapter distinguishes itself from previous studies conducted in the U.S. that compare market response, primarily due to the institutional differences between Australia and the U.S. Notably, in U.S. studies, comparisons are made between market responses to interim quarters earnings (first, second and third quarter earnings) and fourth quarter earnings. By contrast, in Australia, only market responses to interim earnings of the first half-year and to annual earnings

are observable. Furthermore, distinctions in the information environment are evident. The U.S. capital market, characterized by its larger size, exhibits greater liquidity in both information and capital movement. In contrast, Australia, with its comparatively smaller size, relies on the Continuous Disclosure Regime (CDR) to ensure the timely flow of information.

6.3 Contributions and limitations

This thesis aims at increasing awareness of interim reporting among various interested parties. First, the findings might be of interest to regulators and standard setters. Unlike the consistent standards governing annual reporting, which occurs once a year and undergoes mandatory auditing, standards for interim reporting are more flexible and are currently under review in many countries. Interim reports serve the crucial purpose of providing timely information to investors, enabling them to make informed financial decisions. However, this intention can be compromised if interim earnings do not offer a robust foundation for decision-making.

The findings from this thesis indicate that interim earnings is not as reliable as annual earnings, potentially attributed to the combination of less stringent external oversight and a lower quality financial report preparation process. The preparation of financial reports can be particularly costly, especially for small firms with limited resources. Auditors for small firms might not be consistently available to closely monitor interim earnings. Additionally, small firms may not generate significant market responses due to their size. Given the relatively high cost and potentially limited benefits of interim reporting for small firms, there is a suggestion for standard setters to consider the cost-efficiency of standards for such entities. Regulatory bodies could also allocate limited resources to overseeing the reporting quality of larger firms, where the impact on the market and stakeholders may be more substantial.

In addition to external oversight, internal oversight through corporate governance is another channel for safeguarding interim reporting quality. The direct responsibility for ensuring the

quality of interim reporting lies with the audit committee. However, this thesis does not find robust evidence linking audit committee quality to interim reporting quality. This is not an indictment of audit committees, rather, it underscores the potential for improvement in interim reporting quality through heightened awareness within audit committees. Regulators and standard setters can also contribute to this by placing greater emphasis on interim reporting in related documents, such as Corporate Governance Principles and Recommendations. Currently, there is limited content addressing interim reporting in these guidelines.

Second, the findings have implications for investors. Investors are advised to take caution when making decisions based on interim earnings, especially for small firms. The interim earnings of small firms may be a rather poor indicator of future earnings due to their lower reliability. Furthermore, investors of small firms receive limited information and guidance from analysts and market movement because of the scant attention from the capital market. For large firms, while there may be greater external oversight from regulators and auditors, there could be more incentives for earnings manipulation. It appears that the market is aware of this possibility and responds accordingly. Nevertheless, it remains essential for retail investors to note and approach interim earnings with a degree of scepticism.

Finally, the findings bear relevance to auditors. The lower degree of external oversight on interim earnings is understandable given that an interim review, requiring less examination, provides a lower level of assurance compared to a full audit. However, investing greater efforts in the interim review process, especially for large firms, could yield multiple benefits. It would contribute to the improvement of interim earnings quality. Further, a thorough review in the interim period might expedite the annual audit procedure, eliminating the need to repeat work already conducted in the first six months. This could enhance overall auditor efficiency. Also, a comprehensive interim review could bolster the quality of annual earnings, instilling

confidence in the reported figures compared to a rushed examination at the fiscal year-end. Consequently, the annual reporting lag may decrease, leading to greater earnings timeliness.

While the findings in this thesis provide valuable insights, it is crucial to acknowledge its limitations. Firstly, this thesis specifically focuses on interim reporting in Australia, differentiating it from prior research due to global variations in regulations and reporting practices. Consequently, the findings and conclusions drawn are specific to the Australian context and may not be readily generalizable to other countries.

Secondly, there are several limitations related to the research methods employed in this thesis which apply to all empirical archival work in this area. While this thesis takes great care to mitigate their effect on the conclusions, as explained in the following sentences, the issues cannot be completely eliminated. In Chapter 3, earnings qualities are compared using a two-step research design, and one-step models are tested to address methodological concerns. Chapter 4 employs various methods to mitigate endogeneity concerns associated with corporate governance research. In Chapter 5, there is limited availability of analyst forecasts on interim earnings, and the measures used in the research are good proxies but are not perfect reflections of the information conveyed to the capital market.

Moreover, while Chapter 5 focuses on earnings news, it is important to note that various other factors could influence market responses, such as managerial disclosures, media coverage, and competitor disclosures. Future research could delve into the impact of these alternative information sources on market responses surrounding interim earnings and explore how it differs from their impact surrounding annual earnings. The thesis reveals intriguing facts about interim reports in Australia, such as the similar reporting lag and dissimilar number of notes compared to annual reports, however, a detailed examination of these aspects was not conducted. Future research can explore these details further.

The Continuous Disclosure Regime (CDR) plays a crucial role in the Australian information environment on earnings, but there have been widespread claims of CDR non-compliance. While the findings in the thesis suggest potential issues with CDR enforcement, there is no solid evidence. Given the limited academic research on the effectiveness of CDR, future empirical evidence on CDR enforcement could provide valuable insights for research in this area.

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Appendix A

Models for Measures of Interim Earnings Reliability in Chapter 3

Modified Jones Model

I model Modified Jones discretionary accruals as the residual from the following regression, estimated for firm *i* in two-digit GICS code *j* in period *t* (fiscal year and half-year)

$$\frac{TACC_{ijt}}{TA_{ijt-1}} = \alpha_1 \left(\frac{1}{TA_{ijt-1}}\right) + \beta_{1,j} \left[\frac{(\Delta REV_{ijt} - \Delta AR_{ijt})}{TA_{ijt-1}}\right] + \beta_{2,j} \frac{PPE_{ijt}}{ASSETS_{ijt-1}} + \varepsilon_{ijt} \qquad \text{(A.1)}$$

Where:

$TACC_{ijt}$ = total accruals of firm *i* from industry j in period *t* defined as earnings before extraordinary items and discontinued operations less operating cash flows

TA = total assets;

ΔREV = change in revenue for period t. The changes in revenue for annual data is the difference between current revenue and revenue for the previous fiscal year. For interim data, it is the difference between the current half-year revenue and half-year revenue for the previous fiscal year;

ΔAR = change in accounts receivable for period t; and

PPE = gross property, plant and equipment.

Annual income statement measures are divided by two to be comparable to interim income statement measures. Balance sheet items are not adjusted. All variables are winsorised at 1% level to mitigate the effects of extreme variables.

Dechow and Dichev Model

The other widely adopted approach to measuring earnings or accruals quality is to map accruals to the cash flows of previous, current and subsequent periods (Dechow and Dichev, 2002). Accrual quality is measured as the standard deviation of the residuals from firm-specific regressions of changes in working capital on lagged, current and future cash flows from operations. This measure has been refined by

McNichols (2002) and Francis et al. (2005) who added changes in receivables and total PPE to the estimation. I measure accruals quality using the residuals from the following firm-level regression for firm *i* in period *t* (fiscal year and half-year):

$$\Delta WC_{i,t} = \alpha + \beta_{1,i} CFO_{i,t-1} + \beta_{2,i} CFO_{i,t} + \beta_{3,i} CFO_{i,t+1} + \varepsilon_{i,t} \quad \text{(A.2)}$$

Where:

$\Delta WC_{i,t}$ = change in working capital for period t, which is the difference from working capital in fiscal year *t-1* for annual data and the difference from working capital in the half-year of fiscal year *t-1* for interim data. Working capital is calculated as operating current assets less non-interest-bearing current liabilities;

$CFO_{i,t}$ = operating cash flow of firm *i* in period *t*;

$CFO_{i,t-1}$ = operating cash flow in period *t-1* which is the cash flow for fiscal year *t-1* for annual data and the cash flow for the half-year of fiscal year t-1for interim data;

$CFO_{i,t+1}$ = operating cash flow in period *t+1* which is the cash flow of fiscal year *t+1* for annual data and the cash flow for the half-year of fiscal year *t+1* for interim data;

The accrual errors volatility measure is the standard deviation of the residuals from equation (A.3) as follows:

$$DD_i = \sqrt{\frac{\sum_{\forall t}(res_{i,t} - \overline{res_i})^2}{N}} \quad \text{(A.3)}$$

Where:

DD_i = accrual errors volatility measured as the standard deviation of residuals across all years;

$res_{i,t}$ = residual from the regression in model (A.2) in period *t* for firm *i*;

$\overline{res_i}$ = the mean of the residuals from model (A.2) for all periods for firm *i*.

DD is inversely associated with accruals quality.

Again, annual income statement measures are divided by two to be comparable to interim income statement measures. Balance sheet items are not adjusted. All variables are winsorised at 1% level to mitigate the effects of extreme variables.

Earnings Persistence model

The following regression is employed to test the difference between interim and annual earnings persistence following Francis et al. (2004):

$$EBIT_{i,t+1} = \beta_0 + \beta_1 EBIT_{i,t} + \beta_2 INT_{i,t} + \beta_3 EBIT_{i,t} * INT_{i,t} + \varepsilon \quad \text{(A.4)}$$

Where:

$EBIT_{i,t+1}$ = annual (interim) earnings before interest and tax for firm *i* in fiscal year *t+1* for annual (interim) data divided by average total assets;

$EBIT_{i,t}$ = the annual (interim) earnings before interest and tax for firm *i* in fiscal year *t* for annual (interim) data divided by average total assets;

INT = an indicator variable equal to 1 for interim earnings and 0 for annual earnings;

Earnings smoothness model

Earnings smoothness is measured as the ratio of earnings volatility to operating cash flow volatility following Leuz et al. (2003) and Francis et al. (2004). The smoothness measure is generated using seven periods of (interim and annual) data from 2011-2018.

$$smoothness_i = \sigma(NOPAT_{i,t})/\sigma(OCF_{i,t}) \quad \text{(A.5)}$$

Where:

$\sigma(NOPAT_{i,t})$ = standard deviation of net operating profit after tax divided by average total assets;

$\sigma(OCF_{i,t})$ = standard deviation of operating cash flow divided by average total assets.

Appendix B

Additional tests results in Chapter 4

Earnings quality and audit committee expertise: top and bottom quartiles sample

	(1) Annual DA	(2) Interim DA
ACExp	**-0.0059**	**0.0051**
	(-0.93)	(0.94)
ACInd	-0.0181**	-0.0191***
	(-2.50)	(-3.07)
ACFem	-0.0083	0.0052
	(-0.93)	(0.67)
ACsize	-0.0032	0.0034
	(-0.79)	(0.94)
ACtenure	0.0009	0.0004
	(1.11)	(0.51)
BD_ind	0.0043	0.0402*
	(0.16)	(1.78)
BDfem	0.0196	0.0006
	(0.58)	(0.02)
BDsize	0.0016	0.0001
	(1.43)	(0.13)
InOwn	0.0081	-0.0071
	(0.52)	(-0.53)
size	0.0012	-0.0010
	(0.44)	(-0.42)
ROA	0.0449***	0.0015***
	(3.17)	(5.81)
SVOL	0.0036	0.0133***
	(0.85)	(3.03)
BIG4	0.0088	-0.0074
	(1.19)	(-1.16)
leverage	0.0000	-0.0001
	(0.00)	(-0.07)
MTB	-0.0026**	0.0012
	(-2.27)	(1.31)
M_A	-0.0045	-0.0121
	(-0.26)	(-0.81)
CFVOL	-0.0150	0.0043
	(-0.87)	(0.26)
loss	-0.0235**	-0.0043
	(-2.48)	(-0.51)
Cons	-0.0492	-0.0178
	(-1.12)	(-0.47)
N	1269	1291
Industry fixed effects	YES	
Year fixed effects	YES	

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively. This table shows test results on the relation between earnings quality measures and audit committee expertise within the subsample of firms in the top and bottom quartiles of audit committee expertise. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:

DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;

ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Earnings quality and audit committee independence: top and bottom quartiles sample

	(1) Annual DA	(2) Interim DA
ACExp	0.0059	0.0027
	(0.91)	(0.48)
ACInd	**-0.0267*** **	**-0.0129***
	(-3.26)	(-1.91)
ACFem	-0.0074	0.0062
	(-0.80)	(0.75)
ACsize	-0.0030	0.0040
	(-0.84)	(1.27)
ACtenure	-0.0003	-0.0006
	(-0.34)	(-0.91)
BD_ind	-0.0022	0.0069
	(-0.08)	(0.30)
BDfem	0.0359	-0.0064
	(1.02)	(-0.21)
BDsize	0.0014	0.0013
	(1.28)	(1.32)
InOwn	0.0118	-0.0067
	(0.77)	(-0.53)
size	0.0019	-0.0072***
	(0.68)	(-3.06)
ROA	0.0292***	0.0021***
	(5.45)	(9.67)
SVOL	-0.0063	0.0202***
	(-1.54)	(4.50)
BIG4	-0.0002	-0.0209***
	(-0.03)	(-3.33)
leverage	0.0003	0.0020
	(0.14)	(1.10)
MTB	-0.0004	0.0005
	(-0.37)	(0.61)
M_A	0.0144	-0.0024
	(0.74)	(-0.15)
CFVOL	-0.0391**	-0.0027
	(-2.10)	(-0.11)
loss	-0.0388***	-0.0078
	(-4.70)	(-1.02)
Cons	-0.0357	0.1253***
	(-0.80)	(3.32)
N	1287	1273
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively. This table shows test results on the relation between earnings quality measures and audit committee independence within the subsample of firms in the top and bottom quartiles of audit committee independence. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:
DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;
ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Earnings quality and audit committee female representation: top and bottom quartiles sample

	(1) Annual DA	(2) Interim DA
ACExp	-0.0100*	0.0020
	(-1.74)	(0.40)
ACInd	-0.0180***	-0.0155***
	(-2.73)	(-2.66)
ACFem	**-0.0077**	**0.0012**
	(-1.03)	(0.18)
ACsize	-0.0015	-0.0020
	(-0.43)	(-0.71)
ACtenure	-0.0000	0.0005
	(-0.01)	(0.69)
BD_ind	0.0361	-0.0002
	(1.53)	(-0.01)
BDfem	0.0505	0.0132
	(1.60)	(0.48)
BDsize	0.0016	0.0016*
	(1.63)	(1.89)
InOwn	-0.0033	-0.0114
	(-0.23)	(-0.91)
size	0.0019	-0.0025
	(0.78)	(-1.21)
ROA	0.0346***	0.0017***
	(4.76)	(6.09)
SVOL	-0.0014	0.0171***
	(-0.40)	(3.39)
BIG4	-0.0081	-0.0184***
	(-1.13)	(-2.95)
leverage	-0.0022	0.0011
	(-1.08)	(0.65)
MTB	-0.0027***	0.0007
	(-3.06)	(0.96)
M_A	-0.0157	0.0115
	(-1.07)	(0.91)
CFVOL	-0.0321**	-0.0227
	(-2.13)	(-1.44)
loss	-0.0383***	-0.0091
	(-4.86)	(-1.15)
Cons	-0.0158	0.0432
	(-0.41)	(1.32)
N	1265	1295
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively. This table shows test results on the relation between earnings quality measures and audit committee female representation within the subsample of firms in the top and bottom quartiles of audit committee independence. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:

DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;

ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Entropy balanced results on earnings quality and audit committee expertise

	(1) Annual DA	(2) Interim DA
ACExp	**-0.0004**	**0.0041**
	(-0.11)	(1.25)
ACInd	-0.0132***	-0.0111***
	(-2.58)	(-2.68)
ACFem	-0.0026	0.0046
	(-0.52)	(1.08)
ACsize	-0.0033	0.0001
	(-1.49)	(0.05)
ACtenure	0.0002	-0.0008
	(0.35)	(-1.40)
BD_ind	0.0064	0.0201
	(0.37)	(1.34)
BDfem	0.0177	-0.0143
	(0.88)	(-0.74)
BDsize	0.0019***	0.0010*
	(2.70)	(1.83)
InOwn	0.0071	-0.0035
	(0.70)	(-0.40)
size	0.0028	-0.0034**
	(1.63)	(-2.34)
ROA	0.0273***	0.0017***
	(3.79)	(4.50)
SVOL	-0.0003	0.0106**
	(-0.09)	(2.38)
BIG4	-0.0053	-0.0103**
	(-0.98)	(-2.11)
leverage	-0.0037**	-0.0002
	(-2.32)	(-0.20)
MTB	-0.0009	0.0002
	(-1.05)	(0.27)
M_A	-0.0074	0.0087
	(-0.65)	(0.94)
CFVOL	-0.0557**	-0.0121
	(-2.53)	(-0.35)
loss	-0.0238***	-0.0099*
	(-3.94)	(-1.68)
Cons	-0.0438	0.0488**
	(-1.61)	(2.05)
N	3200	3200
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively. This table shows entropy balanced test results on the relation between earnings quality measures and audit committee expertise. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:
DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) ACExp = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; ACInd = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;
ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; ACsize = Audit committee size measured as the number of audit committee members for firm i in year t; ACtenure = The average number of years the audit committee members for firm i have been on the audit committee as of year t; BDInd = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; BDFem = The female representation on board measured as the percentage of female directors on board for firm i in year t; BDsize = board size measured as the number of directors on board for firm i in year t; Instiown = the percentage of shares owned by substantial institutional shareholders; Size = The natural log of the totoal asset of the firm-year observation; ROA = Earnings before interest / (total assets less outside equity interests); SVOL = sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; BIG4 = Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; Leverage = Total assets/shareholders' equity; MTB = Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; M&A = Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; CFVOL = Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; LOSS = Indicator variable coded as one if the net income of the period is less than zero

Entropy balanced results on earnings quality and audit committee independence

	(1) Annual DA	(2) Interim DA
ACExp	-0.0061	0.0049
	(-1.06)	(0.98)
ACInd	**-0.0056**	**-0.0083***
	(-1.11)	(-1.66)
ACFem	-0.0060	-0.0093
	(-1.00)	(-1.40)
ACsize	-0.0018	0.0002
	(-0.65)	(0.08)
ACtenure	0.0006	0.0008
	(0.89)	(1.32)
BD_ind	0.0032	0.0382*
	(0.15)	(1.68)
BDfem	0.0485*	0.0246
	(1.96)	(0.82)
BDsize	0.0006	0.0009
	(0.63)	(1.13)
InOwn	0.0075	-0.0031
	(0.55)	(-0.27)
size	0.0035*	-0.0011
	(1.73)	(-0.56)
ROA	0.0154***	0.0016***
	(3.20)	(3.58)
SVOL	0.0010	0.0118**
	(0.32)	(2.37)
BIG4	-0.0036	-0.0087
	(-0.53)	(-1.33)
leverage	-0.0059***	-0.0031
	(-3.24)	(-1.38)
MTB	-0.0024**	-0.0001
	(-2.41)	(-0.09)
M_A	-0.0193	0.0074
	(-1.31)	(0.67)
CFVOL	-0.0092	-0.0093
	(-0.55)	(-0.39)
loss	-0.0244***	-0.0182**
	(-3.23)	(-2.42)
Cons	-0.0398	-0.0104
	(-1.30)	(-0.37)
N	3200	3200
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.
This table shows entropy balanced test results on the relation between earnings quality measures and audit committee independence. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:
DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;
ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Entropy balanced results on earnings quality and audit committee female representation

	(1) Annual DA	(2) Interim DA
ACExp	-0.0011	-0.0041
	(-0.26)	(-0.99)
ACInd	-0.0097	-0.0142***
	(-1.64)	(-2.82)
ACFem	**-0.0013**	**-0.0033**
	(-0.29)	(-0.78)
ACsize	-0.0047**	-0.0008
	(-2.16)	(-0.47)
ACtenure	-0.0008	0.0019***
	(-1.11)	(2.65)
BD_ind	0.0213	0.0161
	(1.05)	(0.96)
BDfem	0.0038	-0.0738***
	(0.16)	(-2.87)
BDsize	0.0022***	-0.0001
	(2.60)	(-0.13)
InOwn	0.0095	-0.0272**
	(0.69)	(-2.47)
size	-0.0006	-0.0008
	(-0.27)	(-0.48)
ROA	0.0286	0.0008
	(1.29)	(1.20)
SVOL	0.0011	0.0030
	(0.45)	(1.01)
BIG4	-0.0056	-0.0093
	(-0.81)	(-1.28)
leverage	0.0010	-0.0046
	(0.69)	(-1.41)
MTB	-0.0027**	0.0009
	(-2.47)	(0.73)
M_A	-0.0157	-0.0042
	(-1.60)	(-0.55)
CFVOL	-0.0703**	-0.0163
	(-2.52)	(-0.91)
loss	-0.0263***	-0.0241***
	(-3.18)	(-2.59)
Cons	0.0246	0.0603**
	(0.60)	(2.11)
N	3200	3200
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively. This table shows entropy balanced test results on the relation between earnings quality measures and audit committee female representation. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:

DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;

ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Entropy balanced results on earnings quality and audit committee co-option

	(1)	(2)
	Annual DA	Interim DA
co_op	-0.0006	-0.0159***
	(-0.10)	(-3.44)
ACExp	-0.0028	-0.0017
	(-0.64)	(-0.46)
ACInd	-0.0153***	-0.0134***
	(-3.18)	(-3.16)
ACFem	-0.0063	-0.0064
	(-1.22)	(-1.38)
ACsize	-0.0027	-0.0001
	(-1.24)	(-0.03)
ACtenure	-0.0000	0.0003
	(-0.08)	(0.55)
BD_ind	0.0039	0.0340**
	(0.23)	(2.14)
BDfem	0.0564***	0.0087
	(2.59)	(0.45)
BDsize	0.0007	0.0014**
	(0.91)	(2.28)
InOwn	0.0094	-0.0053
	(0.89)	(-0.57)
size	0.0036**	-0.0031*
	(2.02)	(-1.94)
ROA	0.0232***	0.0019***
	(2.70)	(4.55)
SVOL	0.0036	0.0033
	(1.02)	(0.86)
BIG4	-0.0029	-0.0100**
	(-0.51)	(-2.01)
leverage	-0.0043**	-0.0004
	(-2.32)	(-0.26)
MTB	-0.0006	0.0007
	(-0.60)	(0.84)
M_A	-0.0057	0.0099
	(-0.52)	(1.00)
CFVOL	-0.0661***	-0.0101
	(-3.02)	(-0.58)
loss	-0.0205***	-0.0096
	(-3.30)	(-1.47)
Cons	-0.0546**	0.0476**
	(-1.97)	(1.97)
N	2911	2911
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively. This table shows entropy balanced test results on the relation between earnings quality measures and audit committee co-option. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:

DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;

ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Earnings quality and audit committee characteristics: subsample with board independence in the bottom quartile

	(1)	(2)
	Annual DA	Interim DA
ACExp	-0.0053	0.0018
	(-0.52)	(0.23)
ACInd	-0.0292***	-0.0256***
	(-2.65)	(-3.00)
ACFem	-0.0097	0.0236*
	(-0.60)	(1.87)
ACsize	0.0025	0.0000
	(0.44)	(0.01)
ACtenure	0.0010	-0.0012
	(0.83)	(-1.32)
BDfem	0.0913	-0.0322
	(1.51)	(-0.69)
BDsize	-0.0006	0.0021*
	(-0.36)	(1.67)
InOwn	-0.0102	-0.0024
	(-0.47)	(-0.14)
size	0.0041	-0.0072**
	(1.02)	(-2.34)
ROA	0.0426***	0.0019***
	(3.34)	(6.80)
SVOL	0.0003	0.0188***
	(0.05)	(4.04)
BIG4	0.0030	-0.0192**
	(0.28)	(-2.26)
leverage	-0.0023	-0.0022
	(-0.59)	(-0.75)
MTB	0.0022	-0.0016
	(1.18)	(-1.22)
M_A	0.0050	-0.0034
	(0.18)	(-0.15)
CFVOL	-0.0275	0.0180
	(-0.89)	(0.47)
loss	-0.0330***	-0.0110
	(-2.78)	(-1.16)
Cons	-0.0690	0.1495***
	(-1.03)	(2.92)
N	638	642
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively. This table shows test results on the relation between earnings quality measures and audit committee characteristics within subsample with board independence in the bottom quartile. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:
DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;
ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Earnings quality and audit committee characteristics: subsample of IT industry

	(1) Annual DA	(2) Interim DA
ACExp	-0.0216	0.0175
	(-1.40)	(1.39)
ACInd	-0.0072	-0.0015
	(-0.48)	(-0.12)
ACFem	0.0029	0.0174
	(0.16)	(1.19)
ACsize	0.0025	0.0026
	(0.27)	(0.33)
ACtenure	0.0043*	0.0047***
	(1.94)	(2.67)
BDfem	0.0033	-0.1455**
	(0.04)	(-2.14)
BDsize	-0.0035	-0.0051**
	(-1.34)	(-2.42)
InOwn	-0.0309	-0.0889***
	(-1.00)	(-3.90)
size	0.0121	0.0179***
	(1.41)	(2.95)
ROA	0.0094	0.0006
	(1.38)	(0.48)
SVOL	0.0074	-0.0511***
	(1.22)	(-6.49)
BIG4	-0.0001	-0.0054
	(-0.01)	(-0.40)
leverage	-0.0104*	0.0046
	(-1.85)	(0.83)
MTB	-0.0036*	-0.0070***
	(-1.90)	(-4.23)
M_A	0.0103	0.0685
	(0.20)	(1.62)
CFVOL	-0.1092	1.2146***
	(-0.66)	(9.76)
loss	-0.0382**	-0.0251
	(-2.30)	(-1.28)
Cons	-0.1307	-0.3235***
	(-0.96)	(-3.39)
N	278	278
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively. This table shows test results on the relation between earnings quality measures and audit committee characteristics within subsample of IT industry. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:
DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;
ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Earnings quality and audit committee characteristics: subsample with top half MTB ratio

	(1) Annual DA	(2) Interim DA
ACExp	-0.0012	0.0074
	(-0.18)	(1.29)
ACInd	-0.0142**	-0.0162***
	(-2.12)	(-2.78)
ACFem	-0.0015	0.0036
	(-0.17)	(0.49)
ACsize	-0.0027	-0.0005
	(-0.76)	(-0.17)
ACtenure	0.0006	0.0001
	(0.58)	(0.10)
BDfem	0.0195	-0.0255
	(0.58)	(-0.87)
BDsize	0.0020*	0.0013
	(1.89)	(1.48)
InOwn	0.0155	-0.0191*
	(1.15)	(-1.65)
size	0.0025	-0.0009
	(1.06)	(-0.42)
ROA	0.0439***	0.0012***
	(3.66)	(3.79)
SVOL	0.0006	0.0120**
	(0.16)	(2.56)
BIG4	-0.0101	-0.0180***
	(-1.34)	(-2.77)
leverage	-0.0051**	-0.0013
	(-2.52)	(-0.79)
MTB	-0.0010	0.0005
	(-1.26)	(0.69)
M_A	0.0142	0.0197
	(0.86)	(1.31)
CFVOL	-0.0153	0.0082
	(-0.96)	(0.39)
loss	0.0126	0.0026
	(1.28)	(0.26)
Cons	-0.0484	0.0230
	(-1.27)	(0.69)
N	1583	1613
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively. This table shows test results on the relation between earnings quality measures and audit committee characteristics within subsample with MTB ratio higher than the median. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:
DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;
ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Earnings quality and audit committee characteristics: subsample audited by non-big 4 auditors

	(1) Annual DA	(2) Interim DA
ACExp	0.0059	0.0153*
	(0.64)	(1.85)
ACInd	-0.0175*	-0.0074
	(-1.94)	(-0.92)
ACFem	0.0189	0.0114
	(1.31)	(0.88)
ACsize	-0.0033	0.0034
	(-0.57)	(0.66)
ACtenure	0.0009	0.0004
	(0.90)	(0.48)
BDfem	0.0196	-0.0094
	(0.47)	(-0.25)
BDsize	0.0006	-0.0015
	(0.40)	(-1.17)
InOwn	0.0249	-0.0320*
	(1.19)	(-1.68)
size	-0.0012	-0.0046
	(-0.36)	(-1.48)
ROA	0.0329***	0.0027***
	(3.14)	(6.41)
SVOL	-0.0004	0.0121***
	(-0.10)	(3.29)
leverage	-0.0065**	0.0022
	(-2.09)	(0.77)
MTB	0.0001	0.0008
	(0.08)	(0.73)
M_A	-0.0122	0.0005
	(-0.51)	(0.02)
CFVOL	-0.0093	0.0063
	(-0.41)	(0.40)
loss	-0.0079	0.0172
	(-0.77)	(1.63)
Cons	0.0233	0.0864*
	(0.43)	(1.75)
N	903	903
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively. This table shows test results on the relation between earnings quality measures and audit committee characteristics within subsample that is audited by non-big 4 auditors. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + \beta_2 ACExp + \beta_3 ACFem + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:

DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACExp** = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is defined as an accounting financial expert, 0 otherwise; **ACInd** = indicator variable of audit committee independence that takes the value one if 100% of the audit committee members are independent and zero otherwise for firm i in year t;

ACFem = indicator variable where firm i in year t is scored 1 if at least one member of the audit committee is female, 0 otherwise; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Earnings quality and audit committee characteristics: changes in examined members

	(1) Annual DA	(2) Interim DA
ACind_C	-0.0019	-0.0035*
	(-0.84)	(-1.88)
ACexp_C	-0.0012	0.0022
	(-0.40)	(0.92)
ACfem_C	-0.0016	0.0010
	(-0.48)	(0.36)
ACsize	-0.0017	0.0018
	(-0.71)	(0.88)
ACtenure	0.0006	-0.0001
	(1.07)	(-0.26)
BDfem	0.0211	-0.0048
	(1.09)	(-0.30)
BDsize	0.0008	0.0003
	(1.16)	(0.51)
InOwn	0.0099	-0.0074
	(1.09)	(-0.98)
size	0.0016	-0.0017
	(1.12)	(-1.41)
ROA	0.0299***	0.0016***
	(6.93)	(9.83)
SVOL	-0.0002	0.0118***
	(-0.09)	(4.06)
leverage	-0.0041***	-0.0019*
	(-2.97)	(-1.66)
MTB	-0.0009	0.0006
	(-1.49)	(1.14)
M_A	-0.0093	0.0110
	(-0.87)	(1.21)
CFVOL	-0.0266**	0.0034
	(-2.34)	(0.29)
loss	-0.0194***	-0.0051
	(-3.75)	(-1.09)
Cons	-0.0284	0.0241
	(-1.19)	(1.22)
N	3037	3065
Industry fixed effects	YES	YES
Year fixed effects	YES	YES

***, **,* Denote significance (two-tailed) at the 0.01, 0.05, and 0.10 levels, Respectively.

This table shows test results on the relation between earnings quality measures and the change in the number of audit committee members with examined characterisitcs. Column (1) and (2) present the results on the annual and interim discretionary accrual (DA) respectively. The estimation model is equation (3):

$$DA = \alpha_1 + \beta_1 ACInd + C + \beta_2 ACExp\_C + \beta_3 ACFem\_C + \beta_4 ACsize + \beta_5 ACtenure + \beta_6 BDInd + \beta_7 BDfem + \beta_8 BDsize + \beta_9 Instowner + \beta_{10} Size + \beta_{11} ROA + \beta_{12} SVOL + \beta_{13} BIG4 + \beta_{14} Leverage + \beta_{15} MTB + \beta_{16} M\&A + \beta_{17} CFVOL + \beta_{18} LOSS + \varepsilon$$

Where:

DA = discretionary accrual from Modified Jones model (Dechow, Sloan and Sweeny, 1995) (see 4.1.2) **ACInd_C** = the number of changes in independent audit committee members for firm i in year t; **ACExp_C** = the number of changes in audit committee members with accounting financial expert for firm i in year t;

ACFem_C = the number of changes in female audit committee members for firm i in year t; **ACsize** = Audit committee size measured as the number of audit committee members for firm i in year t; **ACtenure** = The average number of years the audit committee members for firm i have been on the audit committee as of year t; **BDInd** = The board independence for the company-year measured as the percentage of independent directors on board for firm i in year t; **BDFem** = The female representation on board measured as the percentage of female directors on board for firm i in year t; **BDsize** = board size measured as the number of directors on board for firm i in year t; **Instiown** = the percentage of shares owned by substantial institutional shareholders; **Size** = The natural log of the totoal asset of the firm-year observation; **ROA =** Earnings before interest / (total assets less outside equity interests); **SVOL =** sales volatility proxied by the standard deviation of firm's sales revenue scaled by lagged total assets; **BIG4 =** Indicator variable coded as 1 for firm-year observations audited by big four auditors and 0 otherwise; **Leverage =** Total assets/shareholders' equity; **MTB =** Market to Book ratio on the firm reporting date calculated as market value of equity/book value of equity; **M&A =** Indicator variable coded as 1 for firm-year observations involved in mergers & acquisitions being either target or bidding firms; **CFVOL =** Cash flow volatility proxied by the standard deviation of firm's operating cash flow scaled by lagged total assets; **LOSS** = Indicator variable coded as one if the net income of the period is less than zero

Appendix C

Variables definition in Chapter 5

Variables	Definition
E(R)	The normal daily return determined by the market and risk adjusted returns model in Sharpe, 1964 for the trading days within the financial year.
CAR	The cumulative abnormal returns of stock from t-1 to t+1 where t is the earnings announcement date. The abnormal return is calculated as the difference between the actual daily return and E(R) the normal daily return.
UE	Unexpected earnings of the half-year/ full fiscal year following seasonal random walk which is the difference between the current half-year/ annual earnings per share and the half-year/ annual earnings per share of the previous fiscal year scaled by the share price of the first trading day of the reporting period.
UE_SH	Unexpected earnings of the first and the second half-year following seasonal random walk. The second half-year is calculated as the difference between the annual earnings and the interim (first half-year earnings).
INT	Indicator variable coded as 1 for interim periods and 0 for annual periods.
Size	The natural log of the market capitalisation.
June	Indicator variable coded as 1 for firms with fiscal year end in June and 0 for firms with fiscal year end in other months.
Institutional ownership	The percentage of shareholding owned by institutional investors within the top20 shareholders.
UE_AF	Unexpected earnings of the half-year/ full fiscal year which is the difference between the actual half-year/ annual earnings per share and the average analyst forecasts within the period of the previous and the current earnings announcements.