Effects of Audit Quality and Audit Committee Characteristics on Earnings Management During the Global Financial Crisis – Evidence from Australia

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Abstract

Purpose: We examine the earnings management behaviour of Australian firms during the Global Financial Crisis (GFC) and the effectiveness of audit quality and audit committee characteristics in mitigating such behaviour.

Design/methodology/approach: The sample consists of 503 firm-year -observations spanning from 2006 to 2009. The years 2008 and 2009 are considered as the global financial crisis period. Discretionary accruals have been used as the proxy for earnings management. To test the hypothesis, we apply multivariate fixed effect regression to test the hypothesis. As the robustness test, we use propensity matching score, to find out comparable clients audited by Big-4 and Non-Big-4 audit firms to control observations to mitigate the effect of selection bias.

Findings: We find that the sampled firms engage in a significantly higher level of earnings management during the GFC compared to the pre-crisis period (PCP). We find that audit quality, in terms of being audited by Big4 auditors, constrains earnings management during the PCP, but not during the GFC. Audit committee independence has a significant mitigating effect on firms' earnings management, while audit committee members' accounting and finance expertise do not constrain earnings management.

Research limitations/implications: Future research can include a larger sample and examine the effects of other corporate governance variables on earnings management during periods of macroscopic shocks.

Practical implications: Our findings support the importance of having independent directors in the audit committee. Moreover, the fact that Big4 auditors do not constrain earnings management during the GFC although constraining it during the PCP implies that regulators and policy makers should concentrate more on the audit committee for effective mitigation of earnings management during periods of macroeconomic shock.

Originality/value: A key policy implication of the findings is that regulators and standard setters may need to shift their focus from the quality of a firm's auditor to encouraging well-functioning audit committees. The specific action to promote audit committee effectiveness includes mandating independence.

JEL classification: M40, M41

Keywords: Earnings management, global financial crisis, audit quality, audit committee

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1. Introduction

Macroeconomic shocks like the 2008-2009 global financial crisis (GFC) and the 1997 Asian Financial Crisis (AFC) create conditions under which the firm's management might be motivated to engage in earnings management activities. Decisions by management to manipulate earnings are often opportunistic responses to specific economic and financial conditions, such as economic downturns or unexpected falls in earnings (Hwang & Lee, 2012; Louis, 2004; Woody, 1997; Jones, 1991; Watts & Zimmerman, 1978).

A body of empirical evidence supports the claim that reported earnings quality varies with changes in the state of the economy. Bertomeu and Magee (2011) suggest that financial reporting quality reaches its maximum when the economy is in its expansionary period, decreases as macroeconomic conditions become less favourable, and increases again when economic conditions become extremely poor. Johnson (1999) suggests that the value relevance of accounting earnings is lower during the economic contraction period than during the expansion period. In contrast, Jenkins et al. (2009) find that earnings are more value relevant during the contractionary than the expansionary period. However, while many studies provide evidence that general macroeconomic conditions/economic cycles affect firms' earnings quality, empirical evidence on the effects of financial crises on firms' earnings management behaviour is limited and the results inconclusive.

Chia et al. (2007) document an increase in Singaporean firms' earnings management behaviour during the 1997 AFC. With respect to the 2008-2009 GFC, van Zalk (2010) reports an increase in earnings management to avoid loss reporting in France and the UK. More specifically, van Zalk (2010) identifies that earnings management to avoid reporting losses rose, while earnings management to avoid earnings decreases fell, during the GFC. However, Filip and Raffournier (2014), who examine the earnings management behaviour of firms' in 16 European countries including France and the UK, find that earnings management decreased significantly during the 2008-2009 GFC period. Furthermore, they suggest that firms' earnings management behaviour is influenced by country level market and institutional forces, and levels of economic growth. They, therefore, caution against generalization of their findings to other country contexts, instead calling for further research in economies with different levels of economic growth and different institutional settings surrounding the GFC, a challenge taken up in this paper.

Financial crises increase the focus on audit quality and practice (Francis, 2004; Fargher & Liwei, 2008), especially where auditor choice or audit quality is perceived to have a significant effect on earnings management behaviour (Chia et al., 2007; Johl et al., 2007; Sikka, 2009). Following major financial collapses in the United States and the European Union (e.g., Enron, WorldCom, Parmalat), audit quality and audit committee characteristics, including the audit committee independence, have been widely recognized as constraining earnings management during normal (i.e., non-crisis) periods (Prencipe & Bar-Yosef, 2011; Lin & Hwang, 2010; Lara et al., 2009; Baxter & Cotter, 2009; Klein, 2002; Xie et al., 2003). The GFC has, however, challenged a host of our existing conceptions regarding the effectiveness of audit quality and audit committee characteristics in monitoring firms' opportunistic reporting behaviour (Holm & Zaman, 2012; Conyon et al., 2011; Sikka, 2009) and protecting shareholders' interests (Conyon et al., 2011). This reflects, globally, the fragile financial position of many large companies during the GFC, even with Big4 audit and, presumably, best-practice audit committee characteristics (e.g., Lehman Brothers in the USA, Northern Rock and the Royal Bank of Scotland in the UK, and UBS in Switzerland).

Lin and Hwang (2010) argue that earnings management is of great concern to corporate stakeholders. However, despite the importance of the topic, empirical evidence on the effect of audit quality and corporate governance on earnings management is inconclusive. Additionally, the role of audit quality and audit committee attributes in mitigating firms' earnings management behaviour during the GFC has remained relatively unexplored. This paper attempts to fill these research gaps. It investigates empirically the earnings management behaviour of Australian firms during the GFC, and the effectiveness of firms' audit quality, audit committee independence, and audit committee members' accounting and finance expertise in mitigating such behaviour. Understanding the role of audit quality and audit committee attributes in mitigating firms' earnings management behaviour surrounding financial crises and macro-economic uncertainty will assist companies to design financial reporting monitoring strategies more appropriate to periods of acute financial distress.

This study makes several important contributions to the earnings management and audit quality literature. First, based on the findings of Bertomeu and Magee (2011) and Filip and Raffournier (2014), European evidence may not generalize to other countries, including Australia. Australia's economy was not as severely affected by the GFC as the US and European economies, with the exception being its stock market, which experienced a similar decline to other major developed economies' stock markets. From October, 2007 to February, 2009, the Australian Securities Exchange (ASX) All Ordinaries Index lost about 51 percent of its value (Bepari, 2012).[5] The illiquidity in the credit market and decrease in economic activity during the GFC jeopardized the going concern assumption of many Australian companies. This resulted in an increase in going concern qualifications in audit reports (Xu et al., 2011), with the Australian Securities and Investment Commission (ASIC) also cautioning companies and their auditors to evaluate and apply the going concern assumption carefully (ASIC, 2008 and 2009).

Australia provides a different economic and institutional setting for studying earnings management behaviour during the GFC, as compared to the GFC-affected US and European economies. Given the conflicting theoretical predictions and inconclusive empirical findings on firms' earnings management behaviour during severe macroeconomic shocks, more empirical analysis is needed to form a conclusive opinion on the issue. Investigating Australian firms may, therefore, provide different insights about managers' earnings management behaviour during the GFC. This may help to avoid making incorrect generalizations concerning firms' earnings management behaviour and the roles of auditors and firms' internal governance mechanisms in constraining such behaviour in different economic and institutional contexts.

Second, this study is the first, to our knowledge, to provide evidence on the effectiveness of audit quality in constraining firms' earnings management behaviour in the context of the GFC. Earlier studies on the GFC (e.g., Filip & Raffournier, 2014 and van Zalk, 2010) do not consider this matter. Chia et al. (2007) provide evidence that audit quality constrained firms' earnings management behaviour during the AFC. However, the impact of the AFC was regional and so less severe

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[5]Immediately before the GFC, Australia was experiencing a stock market boom. In June, 2006 the ASX All Ordinaries index was 5034, which soared up to 6310.6 in June, 2007 and up to 6779 in October, 2007. Thereafter, the index began to decline, dipping to 5332.9 in June, 2008 and further to 3296.9 in February, 2009. At the end of June, 2009, the index was 3947.8. If compared between October, 2007 and February, 2009, the decline in the ASX All Ordinaries index was 51.37 per cent. The S&P/ASX 300 aggregate market to book ratio fell below 1 during March, 2009(Financial Review, 26th October, 2009). On the other hand, major 34 stock market indices worldwide (from USA, UK, Hong Kong, Germany, Japan, Ireland, Portugal, Greece, Italy, Spain, Greece, Singapore, Germany, France, Norway, Hong Kong, Taiwan, Belgium, the Netherlands, Malaysia , Canada, Brazil, Argentina, Mexico, Egypt and India) have declined by an average of about 49 percent from June, 2007 to February, 2009.

(impacting mainly South-East Asian and East Asian countries) than the GFC, which was a global phenomenon (Shah, 2009). In contrast to Chia et al. (2007), we find that audit quality did not constrain the earnings management of Australian firms' during the GFC, although it did so during the pre-GFC period. Consistent with Lawrence et al. (2011) and Minutti-Meza (2013), we find that after eliminating the client size effect using propensity score matching (PPM), audit quality effects in terms of Big4 and non-Big4 differences disappear.

Third, this study complements previous studies that suggest the effect of audit committee independence in constraining firms' earnings management behaviour is statistically significant during general macroeconomic shocks (Holm & Zaman, 2012; Conyon et al., 2011; Sikka, 2009). However, we believe our study to be the first to investigate the effectiveness of audit committee characteristics in constraining firms' earnings management behaviour during a financial crisis. Specifically, we examine the effects of audit committee independence and the finance and accounting expertise of audit committee members in constraining firms' earnings management behaviour during the GFC. We find that while the independence of the audit committees significantly constrained firms' earnings management behaviour during the GFC and pre-GFC periods, the finance and accounting expertise of the audit committee members did not have any significant influence on this behaviour.

Finally, the institutional settings of our study are fundamentally different from that of Chia et al. (2007), who suggested that audit quality constrained firms' earnings management behaviour during the AFC. Their study was conducted in the pre-IFRS period, when rule-based accounting practices were in place in Singapore. Our study, in contrast, is conducted in an IFRS setting. The accounting literature suggests that IFRS constrains earnings management (Chua et al., 2012 and van Zalk, 2010). Further, the impact of the AFC was regional having a considerably less severe impact (impacted mainly South-East Asian and East Asian countries) compared to that of the GFC which was a global phenomenon (Shah, 2009). While Chia et al. (2007) considered only external audit quality; we consider audit committee characteristics in addition to the external audit quality. Our study is also essentially different from Filip and Raffournier (2014) and van Zalk (2010), in that we also examine the effect of audit quality and audit committee attributes in constraining earnings management. As noted, our study is also the first to provide evidence on the effectiveness of audit committee characteristics in constraining firms' earnings management during an economy-wide exogenous shock like the GFC.

Following prior research, earnings management is measured by using the modified version of the Jones model (Kotahri et al., 2005). Our data is derived from the S&P ASX 300 companies and covers the period 2006-2009. The study finds that firms engaged in more discretionary accrual-based earnings management during the GFC (2008-2009). Although audit quality, in terms of the appointment of a Big4 auditor, constrains earnings management during normal economic conditions, it was ineffective in constraining earnings management during the GFC. The independence of audit committees has a statistically significant constraining effect on firms' earnings management during both the GFC and the pre-crisis period (PCP). However, the accounting and finance backgrounds of the audit committee members do not constrain earning management. The findings thus suggest that during severe macro-economic shocks, such as the GFC, an independent audit committee is more effective than reliance on audit quality in mitigating firms' earnings management behaviours.

The present study contributes to the earnings management and audit quality literature by providing empirical evidence on firms' earnings management behaviour and the effect of audit quality and

audit committee independence in mitigating such behaviour in the context of the GFC. This compares to existing evidence based on regional crises such as the AFC. The rest of the paper is structured as follows. Section 2 reviews the relevant literature and develops the hypotheses. Section 3 provides the research methodology, describes the data, sample, and variables. Section 4 describes the empirical estimation methods. Section 5 presents and discusses the results and findings of the study. Section 6 concludes the paper.

2. Literature review and the development of hypotheses

2.1. Earnings management during the financial crisis

The 'big bath' hypothesis provides an appropriate basis to suggest that income decreasing earnings management should increase during periods of financial crisis. Depressed firm performance can be attributed to poor macroeconomic outcomes without raising questions about managers' performance. The GFC's economy-wide exogenous shocks may have motivated mangers to manipulate earnings downwards, attributing reduced earnings to the macroeconomic shocks rather than to poor managerial performance (Richardson, 2000; Kim & Yi, 2006). Moreover, during an economy-wide exogenous shock like the GFC, the market may be more inclined to tolerate poor performance, motivating managers to manipulate earnings downward (Ahamd-Zaluki et al., 2011).[6] Affected firms may also reduce reported earnings during financial crises to undertake debt restructuring. This is due to debt covenant violation or failure to meet debt obligations, and represents an effort to receive concessions in the restructuring process. Ahmed et al. (2008) documents that Malaysian firms managed earnings via income decreasing accruals during the AFC to gain government support for debt restructuring. Securing government support may also motivate managers to undertake income decreasing earnings management (Peltzman, 1976; Jones, 1991; Lim & Matolcsy, 1999). Chia et al. (2007) observe increases in such income decreasing earnings management phenomena in service-oriented firms in Singapore during the 1997 AFC. This is attributed to the potential financial support and benefits offered by the Singapore government surrounding the AFC. Finally, the objective of extracting concessions during union renegotiation by depicting the firm as seriously troubled may also provide a motivation for income decreasing earnings management (DeAngelo et al. 1994).

However, managers may also be motivated to engage in income increasing (or income smoothing) earnings management during a financial crisis to avoid declines in share prices that may adversely affect their compensation (Charitou et al., 2007). Matsunaga and Park (2001) suggest that managers also have compensation-based incentives to meet analysts' forecast and to avoid earnings declines. Moehrle (2002) finds that firms record restructuring accrual reversals to beat analysts' forecasts, to avoid reporting net losses, and also to avoid earnings declines. Avoiding debt covenant violation may also provide a motivation for income increasing earnings management (Iatridis & Kadorinis, 2009; Saleh & Ahmed, 2005).

Existing evidence on the effect of the GFC on firms' earnings management behaviour is inconclusive. Filip and Raffournier (2014) and van Zalk (2010) examine firms' earnings management behaviour in European countries during the GFC and find conflicting results. While Filip and Raffournier (2014) find that earnings management decreased significantly during the GFC, van Zalk (2010) reports that, in fact, earnings management to avoid reporting losses

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[6] In this context, taking a 'big bath' by downwards earnings management would clear the deck for future earnings/bonuses.

increased during the GFC, while earnings management to avoid earnings decreases decreased during the period. Additionally, Filip and Raffournier (2014) suggest that firms' earnings management behaviour is influenced by the country level market and institutional forces.

Given that most of the theoretical predictions and empirical findings indicate that the direction of expected earnings management, both income-increasing and income-decreasing, during the economy-wide exogenous shock in general, and during the GFC in particular, may increase, we hypothesize that:

H1: *Firms engaged in more earnings management during the 2008-2009 GFC than in the pre-crisis period.*

2.2. Audit quality, audit committee characteristics and earnings management

Prior studies provide mixed evidence on the effect of audit quality in constraining the earnings management behaviour of firms. While many studies support the claim that the use of a Big4/5/6 auditor reduces earnings management (Baxter and Cotter, 2009; Hutchinson et al., 2008; Lin et al., 2006), some studies find no significant constraining effect of this audit quality measure (Maijoor & Vanstraelen, 2006; Davidson et al., 2005). Lawrence et al. (2011) also do not find any significant effect for a Big4 auditor, after adjusting for the client size effect. These findings, though, relate to Big4 (5/6) audit impact over the general economic cycle (i.e., trough, recovery, boom and recession). Rusmin et al. (2013) find that audit quality does not constrain income increasing earnings management by Asian firms, although they do not consider income decreasing earnings management.

The GFC provides a different economic environment in which to examine the effects of audit quality and audit committee characteristics. It has raised doubts about the quality of audit and its effectiveness in monitoring firms' opportunistic reporting behaviour (Holm & Zaman, 2012; Conyon et al., 2011; Sikka, 2009). This is because of the fragile financial position of many large companies around the globe during the GFC, even where audited by Big4 auditors and, presumably, with best-practice audit committee characteristics (e.g., Lehman Brothers in the USA, Northern Rock and the Royal Bank of Scotland in the UK, and UBS in Switzerland). Sikka (2009) raises concerns that auditors failed to issue a going concern qualification for banks, such as Lehman Brothers, that shortly after disclosed financial distress. Evidence that companies cut audit fees during the GFC due to funding constraints (Krishnan and Zhang, 2014), indicates that audit effort and audit quality may have been compromised, with the consequent effect on earnings management behaviour. Indeed, the United States' Public Company Accounting Oversight Board (PCAOB) has expressed concerns that lower audit fees during the GFC may have led to lower audit effort and lower quality audits.

During an economy-wide exogenous shock like that of the GFC, auditors may face additional legal challenges if external parties, suffering losses associated with the financial crisis, claim negligence by the auditor. During a financial crisis, auditors therefore potentially have an incentive to be more cautious in their audit process. Consistent with this, Alexeyeva and Svanström (2015) claim that auditors demanded higher audit fees during the GFC for increased audit efforts, while Xu et al. (2011) find that, in Australia, audit quality, expressed in terms of going-concern opinion, increased during the GFC. To the extent that auditors constrain earnings management by managers, audit quality, and earnings management are expected to have a negative association. Chia et al. (2007) find evidence in support of this conjecture in the context of Singaporean service firms during the

AFC. Similarly in the context of the AFC, Johl et al. (2007) find that Big5 audit firms in Malaysia qualified audit reports more frequently than their non-Big-5 counterparts in the presence of high levels of abnormal accruals. In the context of the GFC, Krishnan and Zhang (2014) document that Big4 auditors constrained earnings management via loan loss provisioning.

Based on the above theoretical predictions and prior empirical evidence, the second hypothesis is:

H2:   *Firms audited by Big4 audit firms engaged in less earnings management during the 2008-2009 GFC than firms audited by non-Big4 audit firms.*

A firm's audit committee is an integral part of its internal control and corporate governance. Because a board's audit committee oversees the financial reporting function and liaises with auditors and management, its influence on firms' reporting behaviour is likely to be greater than that of the remainder of the board (Kent et al. 2010). ASX listing rules require that all firms included in the All Ordinaries Index must appoint an audit committee. Prior to 2003, the formation of this board subcommittee was voluntary. Consequently, a number of papers examine the association between various audit committee attributes (size, expertise, frequency of meetings, and independence) and abnormal accruals (Davidson et al. 2005; Baxter and Cotter 2009; Kent et al.2010).

Empirical studies provide mixed evidence of the effect of an audit committee's characteristics on earnings management under normal economic conditions. For example, Abbott et al., (2000) find that earnings management decreases with increasing independence of the audit committee. In addition, following major corporate collapses in the US and in the European Union (e.g., Enron, WorldCom, Parmalat), audit committee-related corporate governance, including the independence of the audit committee, has been widely recognized as constraining earnings management during normal (non-crisis) periods (Prencipe & Bar- Yosef, 2011; Lin & Hwang, 2010; Lara et al., 2009; Baxter & Cotter, 2009; Yang & Krishnan, 2005; Abbott et. al., 2004; Choi et al., 2004; Xie et al., 2003; Klein, 2002). However, Choi et al., (2004) find no such effect. Xie et al. (2003) find no significant association between the number of directors on the audit committee and earnings management. Similarly, Abbott et al., (2004) find no impact of audit committee size on earnings restatements.

Acknowledging the important monitoring role played by accounting and finance experts on the board and audit committee, the Sarbanes Oxley Act of 2002 (section 407) proposes that all public companies should disclose in their annual reports whether there is at least one member in the audit committee with accounting and financial expertise. The Australian Securities and Investment Commission (ASIC) has issued Information Sheet 183 *Directors and Financial Reporting* (INFO 183) which stresses the importance of directors having financial literacy and sufficient knowledge of accounting practices. Aldamen et al. (2012) find that audit committees with more experience and financial expertise are more likely to be associated with positive firm market performance during the GFC, although they do not consider the issue of earnings management. In the wake of the aforementioned increasing concerns about and criticisms of firms' audit quality during the GFC (for example, Holm and Zaman, 2012; Sikka, 2009 and the Public Company Accounting Oversight Board –PCAOB of the USA), it is probable that audit committees may have assumed an added responsibility in improving financial reporting quality by constraining firms' earnings management behaviour. In a recent study Sultana (2015), using Australian data, finds a positive association

between accounting conservatism and: (a) a director with financial expertise on the audit committee; (b) an experienced director on the audit committee; and (c) frequency of audit committee meetings. The author commented that within an agency theoretical framework, these results suggest that audit committees act as effective monitoring mechanisms in restricting management's opportunistic behaviour and overstatement of earnings.

Audit committee independence was the focus of several papers, and is typically measured similarly to board independence. The empirical evidence reported is mixed. Davidson et al. (2005) report that absolute abnormal accruals are lower for firms with a majority of nonexecutives sitting on their audit committee. However, their sample includes firms that do not have an audit committee, making the specification of their model questionable. Davidson et al. (2005) find that the existence of an audit committee is significantly positively related to abnormal accruals, and thus the relative independence of the audit committee merely mitigates part of this unexpected effect. Baxter and Cotter (2009) find no significant relationship between audit committee independence and earnings management. Kent et al. (2010), however, report a weak negative relation between earnings management and audit committee independence in a single year sample of Australian firms for which the formation of an audit committee was mandatory. However, the role of audit committee characteristics, during a financial crisis, remains unexplored.

In this study, we consider the effect on financial reporting of audit committee independence and audit committee members' accounting and finance background. Existing empirical evidence during general economic conditions and recent regulatory initiatives on these matters, suggest that audit committees may have undertaken an additional oversight role and constrained firms' earnings management behaviours during the GFC. It is in this light, we propose the following hypotheses:

H3:   *Firms with greater audit committee independence (e.g., a higher proportion of independent members in the audit committee), engaged in less earnings management during the 2008-2009 GFC.*

H4:   *Firms with a higher level of accounting-finance expertise of audit committee (e.g., with a higher proportion of audit committee members with accounting and finance expertise), engaged in less earnings management during the GFC.*

3. Research methods
3.1. Data and sample
Initially, all firms listed in the S&P ASX 300 as at 30 September 2009 were included in the sample. These firms represent over 80 per cent of the market capitalization of ASX listed companies (S&P, 2007). Consistent with their exclusion in previous studies (Baxter & Cotter, 2009; Habib & Azim, 2008), financial firms (banks, other financial institutions, and trusts) were excluded because they have different legal and regulatory reporting requirements,[7] as were utility companies; a total of 64 firms. Eight more firms were excluded because of the non-availability of their annual reports in the *Connect Four* annual report collection, while six firms that did not have audit committees mentioned in their annual reports were also excluded. A further 89 firms either did not have the

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[7] Another important reason to exclude financial firms is that the Australian government provided a deposit guarantee for authorised deposit-taking institutions during the GFC.

required variables for the calculation of proxies for earnings management—discretionary accruals (DACs)—or they belong to an industry with fewer than ten firms (the calculation of DACs requires that there be at least 10 firms in the industry). After excluding these firms, the sample has 133, 132, 122 and 116 firms for the years 2009, 2008, 2007 and 2006 respectively. The final sample thus consists of a total of 503 firm-year observations. Table 1 outlines the industry distribution of the final sample.

Table 1: Industry distribution of the sample

Industry distribution of the sample					
	2009	2008	2007	2006	Total
Consumer Discretionary (CD)	13	13	12	11	49
Consumer Staples (CS)	9	9	8	8	34
Energy (ENERGY)	28	28	27	24	107
Health Care (HC)	9	9	9	9	36
Industrials (IND)	32	32	30	28	122
Information Technology (IT)	7	7	7	7	28
Materials (MAT)	33	32	27	27	119
Telecommunications Services (TEL)	2	2	2	2	8
Total	**133**	**132**	**122**	**116**	**503**

Audit quality data has been collected from the annual reports of the companies, sourced from the *Connect 4* data base, while other financial accounting data have been collected from the *Datastream Advance* data base.

3.2 Variables and measures
3.2.1 Proxies for earnings management—discretionary accruals
We measure our proxies for earnings management using the cross-section versions of the Jones (1991) and Modified Jones models. Jones (1991) decomposed total accruals (TACs) into non-discretionary accruals (NDAs) and discretionary accruals (DACs) with the following regression model:

Jones (1991) model:

$$\frac{TAC_{it}}{TA_{it-1}} = \alpha_1 \frac{1}{TA_{it-1}} + \alpha_2 \frac{\Delta REV_{it}}{TA_{it-1}} + \alpha_3 \frac{PPE_{it}}{TA_{it-1}} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(1)}$$

Where:

TAC_{it}	Total accruals (net income – cash flow from operations) for firm i at time t
TA_{it-1}	Total assets at the beginning of the year for firm i at time t
ΔREV_{it}	Change in total revenue for firm i at time t
PPE_{it}	Property, plant and equipment for firm i at time t
ε_{it}	Error term (discretionary accruals component) for firm i at time t

TACs are assumed to be the sum of both DACs and NDAs. To separate NDAs from DACs, total accruals are regressed on changes in revenue or sales during the year, and the firm's property, plant

and equipment (Eq. 1). The unexplained portion of total accruals from this regression is considered as a measure of DACs.

Dechow et al. (1995) propose a modification of the Jones (1991) model adjusting for the change in receivables. Kothari et al. (2005) improve upon Dechow et al. (1995) and the Modified Jones model by including an additional control variable—'return on assets' (ROA)—to control for the impact of firm performance. We expect that any effect of negative economic shocks (i.e., negative performance during the GFC) to be captured by the ROA variable in the model (Eq. 2).

Modified Jones model, adjusted for firm performance (Kothari et al., 2005):

$$\frac{TAC_{it}}{TA_{it-1}} = \alpha_1 \frac{1}{TA_{it-1}} + \alpha_2 \frac{\Delta REV_{it} - \Delta REC_{it}}{TA_{it-1}} + \alpha_3 \frac{PPE_{it}}{TA_{it-1}} + \alpha_4 ROA_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots.. (2)$$

Where:
$\Delta REC_{it:}$ = Change in receivables for firm i at time t
ROA_{it} = Return on Assets for firm i at time t

Dechow et al. (1995) evaluate the relative performance of five DAC models and conclude that the Jones (1991) and Modified Jones models perform better than the other models. Ahmed et al. (2008) and Rahman et al. (2010) later reach the same conclusions. Baxter and Cotter (2009) and Kim and Yi (2006) indicate that measures based on the Jones' earnings management' model are generally characterized as capturing managements' opportunistic earnings management behaviour. Choi et al., (2011) and Filip and Raffournier (2014) have used this model to estimate earnings management measures.

The un-standardized residual values in models 1 and 2 represent discretionary, or abnormal, accruals (DACs). These measures are identified as DAC1 and DAC2 in this study. The explained component of the models represents non-discretionary accruals (NDAs). The variance of the un-standardized residuals in models 1 and 2 is considered to be an inverse measure of accrual quality (Dechow & Dichev, 2002; Rajgopal & Venkatachalam, 2011; Filip & Raffournier, 2014). The standard deviation of the residuals (DAC1 and DAC2) from models 1 and 2 represents accruals quality. A low standard deviation of residuals is considered as evidencing high accruals quality and thus low earnings management, and a high standard deviation of residuals is considered as evidence of low accruals quality, and therefore of a high level of earnings management. Following prior research (Filip & Raffournier, 2014), we calculate the standard deviation of residuals in order to compare accruals quality differences between the GFC and the PCP.

DACs can be either positive or negative. Negative DACs represent income-decreasing discretionary accruals, while positive DACs are considered as income-increasing discretionary accruals. Consistent with prior studies (Francis et al., 1999 and Krishnan, 2003), the absolute values of the residuals in model 1and 2 are denoted as ABSDAC1 and ABSDAC2 respectively, and have been used as alternative proxies for earnings management in this study.

Hribar and Collins (2002) argue that the difference between net income and cash flows from operations is the correct measure of total accruals and that the use of a balance sheet approach may in some circumstances lead to a systematic bias in the estimated discretionary accruals. Hence, following Hribar and Collins (2002), Ahmed et al. (2008) and Choi et al. (2011), total accruals (TACs) have been calculated by subtracting cash flows from operations (CFO) from income before extraordinary items and tax.

4. Empirical estimation methods

To test the change in firms' earnings management behaviour during the GFC, we use independent sample t-tests and panel fixed effect regression analyses in addition to the discretionary accruals quality (standard deviation) test used by Filip and Raffournier (2014). Use of the same discretionary accruals quality test in our study provides an additional benefit in terms of the comparability of our results with those of Filip and Raffournier (2014) in the context of 16 European countries, providing a comparative international context of our findings. This also overcomes weaknesses in Van Zalk (2010), who uses histograms to look at the earnings distributions and a standardized differences test (or t-test) to test for significance of differences in earnings management before and during the financial crisis.

4.1 Model to test hypothesis 1

To test Hypothesis 1, the effect of the GFC on earnings management is examined by estimating the following cross-sectional fixed effect model:

$$ABSDAC_{it} = \alpha_0 + \beta_1 CRISIS + \beta_2 CFO_{it} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \beta_5 NEG_{it} + \mu_{it} \ \dots \ (3)$$

Where:

$ABSDAC_{it}$ = absolute value of discretionary accruals for firm *i* during year *t*

CRISIS = dummy variable representing the GFC, taking the value of 1 for years 2008 and 2009, 0 otherwise

CFO_{it} = cash flows from operations for firm *i* during year *t*, divided by the number of shares outstanding, to control for the effect of changes in cash flows

LEV_{it} = leverage ratio of firm *i* during year *t*, measured as total liabilities to total assets to control for the impact of debt-covenant hypothesis and financial risk on discretionary accruals

$SIZE_{it}$ = natural log of the market value of firm *i* during year *t*, to control for the client size

NEG_{it} = indicator variable taking the value of 1 if firm *i* has negative earnings for year *t*, 0 otherwise, to control for the effect of negative economic shocks of the GFC

μ_{it} = error terms.

Model 3 was estimated to examine if firms' earnings management increased during the GFC compared to the PCP. A statistically significant and positive coefficient (β_1) on the CRISIS variable in model 3 would imply that firms engaged in a significantly higher level of earnings management during the GFC as compared to that undertaken during the PCP. CFO, LEV, SIZE and NEG have been included as control variables.

4.2. Models to test hypotheses 2, 3 and 4

To test the effect of audit quality and audit committee attributes in constraining firms' earnings management behaviour during the GFC, this paper utilizes panel fixed-effect regression analysis following Minutti-Meza (2013). The following models are estimated:

$$ABSDAC_{it} = \alpha_0 + \beta_1 CRISIS + \beta_2 BIG4_{it} + \beta_3 ACIND_{it} + \beta_4 ACFINAC_{it} + \\ \beta_5 CFO_{it} + \beta_6 LEV_{it} + \beta_7 SIZE_{it} + \beta_8 NEG_{it} + \mu_{it} \qquad \dots\dots\dots (4)$$

$$ABSDAC_{it} = \alpha_0 + \beta_1 CRISIS + \beta_2 BIG4_{it} + \beta_3 ACIND_{it} + \beta_4 ACFINAC_{it} +$$
$$\beta_5 CFO_{it} + \beta_6 LEV_{it} + \beta_7 SIZE_{it} + \beta_8 NEG_{it} + \beta_9 CRISIS * BIG4_{it} + \beta_{10} CRISIS * ACIND_{it} + \cdots\cdots (5)$$
$$\beta_{11} CRISIS * ACFINAC_{it} + \mu_{it}$$

Where:

$ABSDAC_{it}$ = absolute value of discretionary accruals for firm i during year t

$Big4_{it}$ = indicator variable taking the value of 1 for firm i if the firm has been audited by one of the big 4 audit firms during year t, 0 otherwise

$ACIND_{it}$ = Proportion of independent directors in the audit committee of firm i in year t

$ACFINAC_{it}$ = Number of members in the audit committee of firm i in year t with accounting and finance expertise

$CRISIS*Big4$ = $BIG4$ and $CRISIS$ interaction

$CRISIS*ACIND$ = $CRISIS$ and $ACIND_{it}$ interaction

$CRISIS*ACFINAC$ = $CRISIS$ and $ACFINAC_{it}$ interaction

CRISIS = dummy variable representing the GFC, taking the value of 1 for years 2008 and 2009, 0 otherwise

CFO_{it} = cash flows from operations for firm i during year t, divided by number of shares outstanding, to control for the effect of changes in cash flows

LEV_{it} = leverage ratio of firm i during year t, measured as total liabilities to total assets to control for the impact of debt-covenant hypothesis and financial risk on discretionary accruals

$SIZE_{it}$ = natural log of the market value of firm i during year t, to control for the client size

NEG_{it} = indicator variable taking the value of 1 if firm i has negative earnings for year t, 0 otherwise, to control for the effect of negative economic shocks of the GFC

μ_{it} = error terms.

A statistically significant coefficient for any interaction term (β_9, β_{10}, and β_{11}) will imply that a particular variable had a different effect on earnings management during the GFC as compared to the PCP. The net effect of the variables Big4, ACIND and ACFINAC during the GFC will be determined by $\beta_2 + \beta_9$, $\beta_3 + \beta_{10}$, $\beta_4 + \beta_{11}$ respectively. CFO, LEV, SIZE and NEG are used as control variables. Previous studies have found these variables to be significantly related to firms' accruals level. The CRISIS dummy variable captures the period effects. So, models 3, 4 and 5 are estimated with one-way cross-section (firm) fixed effects, excluding the industry dummy variables. We expect that the effect of the negative economic shock of the GFC, if any, to be controlled by the variable NEG in the equation.

4.3 Robustness

Following prior studies (Rosenbaum & Rubin, 1983; Li & Prabhala, 2007; Lennox et al., 2012; and Lawrence et al., 2011), we use propensity-score matching models to test the robustness of the Big4 treatment effects after controlling for differences in client characteristics (i.e., client size) between the two auditor groups while estimating auditor treatment effects. This overcomes the approach of Chia et al. (2007) who examine the audit quality effect on the earnings management of companies in Singapore in the context of the AFC, and employ a type of seemingly unrelated regression analysis, ITSUR, which is unable to separate the client size effects from the audit quality effect in terms of Big4 versus non-Big4 difference.

Propensity-score matching is a methodology widely used to find a group of comparable cases and control observations to mitigate the effect of selection bias, or differences in characteristics between treatment and control groups, in observational causal studies. In general, this approach is used to match observations that belong to two different regimes. In the context of our study, it is used to find comparable clients audited by Big4 and non-Big4 auditors. Using propensity scores, control observations are matched to treatment observations based on a specified distance between their overall probabilities of undergoing treatment. The probabilities are estimated using a number

of covariates that predict choice, aggregating multiple dimensions into the probability of treatment, which is used as a single matching variable. Propensity scores are calculated using Equation (6).

$$BIG4_{it} = \alpha_0 + \beta_1 CRISIS + \beta_2 ACIND_{it} + \beta_3 ACFINAC_{it} + \beta_4 CFO_{it} + \beta_5 LEV_{it} + \beta_6 SIZE +$$
$$\beta_7 NEG_{it} + \sum_{i=1}^{j} \rho_i Ind_i + \mu_{it} \qquad \qquad \text{............(6)}$$

Where,

Big4 = indicator variable taking the value of 1 for firm i if the firm has been audited by one of the big 4 audit firms during year t, 0 otherwise; ACIND = Proportion of independent directors in the audit committee of firm i in year t; ACFINAC= Number of members in the audit committee of firm i in year t with accounting and finance expertise. CRISIS = dummy variable representing the GFC, taking the value of 1 for years 2008 and 2009, 0 otherwise; CFO = cash flows from operations for firm i during year t, divided by number of shares outstanding, to control for the effect of changes in cash flows; LEV = leverage ratio of firm i during year t, measured as total liabilities to total assets to control for the impact of debt-covenant hypothesis and financial risk on discretionary accruals; SIZE = natural log of the market value of firm i during year t, to control for the client size; NEG = indicator variable taking the value of 1 if firm i has negative earnings for year t, 0 otherwise, to control for the effect of negative economic shocks of the GFC; Ind = industry dummy variables and μ_{it} = error terms.

The maximum caliper distance (radius) used in this analysis is 0.05 with common support to locate matches. To obtain variance, 100 bootstrap replications with replacement (controls may have been reused in defining matches) have been used. The Matching Model R^2 reported is the pseudo R^2 of the propensity score model.

5. Results of univariate tests and multivariate regression analyses
5.1. Descriptive statistics
Table 2 provides descriptive statistics of the dependent variables and the main independent variables used in models 3 to 5.

Table 2: Descriptive statistics - pooled sample (N= 503)

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
ABSDAC1	0.190	1.984	0.000	0.303	3.215	14.990
ABSDAC2	0.163	1.970	0.000	0.261	3.443	17.617
LOGMV	5.879	8.171	2.982	0.741	0.096	3.382
NEG	0.286	1.000	0.000	0.452	0.946	1.894
CFO	1.382	127.911	-5.632	7.463	12.108	181.336
LEV	0.613	52.963	0.000	2.372	21.440	473.401
BIG4	0.827	1.000	0.000	0.379	-1.729	3.991
ACIND	0.611	1.000	0.000	0.500	-0.044	1.002
ACFINAC	1.356	5.000	0.000	0.975	0.389	2.802
CRISIS	0.527	1.000	0.000	0.500	-0.108	1.012

Where,
ABSDAC1 and ABSDAC2 = absolute values of the un-standardized residual values from model 1 and 2 respectively represent the discretionary accruals (DACs, also called abnormal accruals) for firm i during year t; LOGMV = natural log of the market value of firm i during year t, to control for the client size, variable SIZE; NEG

= indicator variable taking the value of 1 if firm i has negative earnings for year t, 0 otherwise, to control for the effect of negative economic shocks of the GFC; CFO = cash flows from operations for firm i during year t, divided by number of shares outstanding, to control for the effect of changes in cash flows; LEV = leverage ratio of firm i during year t, measured as total liabilities to total assets to control for the impact of debt-covenant hypothesis and financial risk on discretionary accruals; Big4 = indicator variable taking the value of 1 for firm *i* if the firm has been audited by one of the big 4 audit firms during year *t*, 0 otherwise; ACIND = Proportion of independent directors in the audit committee of firm *i* in year *t*; ACFINAC= Number of members in the audit committee of firm *i* in year *t* with accounting and finance expertise. CRISIS = dummy variable representing the GFC, taking the value of 1 for years 2008 and 2009, 0 otherwise.

The means of the absolute value of DACs are 0.190, and 0.163, respectively, for ABSDAC1 and ABSDAC2. These measures compare well with the means of the absolute value of DACs of 0.18 found by Baxter and Cotter (2009) and 0.156 found by Davidson et al. (2005) for the Australian market. The skewness and kurtosis statistics suggest that some variables are not normally distributed. Therefore, to remove any heteroskedasticity problems arising out of the non-normal distributions, all regressions, where applicable, are estimated with heteroscedasticity adjusted standard errors and *t*-statistics.

Table 3 shows the correlation coefficients between different pairs of variables. The correlations between the two proxies for earnings management (ABSDAC1 and ABSDAC2) are positive and statistically significant. This suggests that these proxies are capturing similar phenomena. The CRISIS dummy variable is positively correlated with both measures of earnings management. This provides initial support for the proposition that the absolute levels of DACs were higher during the GFC (compared to the PCP). Of particular interest is that the independent variables are not highly correlated to each other. This reduces concern about multicollinearity impacting the precision of estimated coefficients.

Table 3: Pearson correlation coefficients (N=503)

	ABSDAC1	ABSDAC2	CRISIS	SIZE	CFO	LEV	NEG	BIG4	ACIND	ACFINAC
ABSDAC1	1									
ABSDAC2	0.946**	1								
CRISIS	0.126*	0.128*	1							
SIZE	0.270**	0.273**	-0.067	1						
CFO	0.229**	0.249**	0.118	0.218*	1					
LEV	-0.013	-0.013	-0.069	-0.028	0.002	1				
NEG	-0.133**	-0.146**	0.025	-0.290	-0.093*	-0.061	1			
BIG4	0.144**	0.151*	0.031	0.364**	0.108	-0.074	-0.344**	1		
ACIND	-0.12**	-0.17**	0.033	0.197**	0.077	-0.024	-0.134**	0.097**	1	
ACFINAC	0.092*	0.104*	0.015	0.253**	0.124	-0.033	-0.308**	0.202**	0.304**	1

[**] Significant at the 1 per cent level; * Significant at the 5 per cent level.

5.2 Univariate test results for Hypothesis 1:
Hypothesis 1 states that firms engaged in more earnings management during the 2008-2009 GFC than in the pre-crisis period.

We test the hypothesis using both univariate independent sample t-tests and multivariate regressions. Table 4 shows the univariate test results for the differences in the means of the absolute value of accruals between the GFC and the PCP. The means of two proxies of earning management (ABSDAC1, and ABSDAC2) are higher during the GFC than those during the PCP. The independent sample t-test suggests that the difference in the proxies of earnings management between the GFC and the PCP are statistically significant. This implies that firms' accrual levels, and thereby, the earnings management increased during the GFC compared to the PCP.

Table 4: Change in the earnings management during the GFC: Independent sample t-tests

	Mean		Difference GFC vs. PCP		Independent sample t -test (t-stat) for the difference in mean
Panel A: Differences in accruals levels between the GFC and the PCP					
	GFC	PCP	GFC-PCP		GFC vs. PCP
ABSDAC1	.220	.152	0.068		2.553**
ABSDAC2	.192	.126	0.066		2.751***

***Significant at 1 percent level; **Significant at 5 percent level;

Following Filip and Raffournier (2014)[8] the significance of the difference in accrual quality between the GFC and the PCP was tested by using a bootstrapping (simulation) procedure that randomly selects a sample of 100 firms-year observations with replacement. We computed our proxy for accrual quality (standard deviations of DAC) and repeated the procedure 1000 times each for both the GFC period and the PCP and performed the independent samples t-test. The low standard deviation of the discretionary accruals is considered as evidencing high accruals quality and thus low earnings management, and the high standard deviation of the discretionary accruals is considered as evidence of low accruals quality and, therefore, a high level of earnings management. The results are presented in Table 5, Panel A. The differences in the accrual quality measures, standard deviation of accruals, between the GFC and the PCP are statistically significant, suggesting that the standard deviation of accruals during the GFC were higher than the standard deviation of accruals during the PCP, which in turn suggests that firms engaged in greater levels of earnings management during the GFC.

To determine whether the differences in accruals between the GFC and the PCP resulted from income increasing accruals, income decreasing accruals, or both, we divide the observations into two sub-samples of positive accruals and negative accruals, and then perform the same bootstrapping procedures separately for the sub-samples. The results are presented in Panel B and Panel C of Table 5. The differences in the accrual quality measures between the GFC and the PCP are statistically significant for both the positive and negative accruals sub-samples. This suggests that the standard deviation of accruals during the GFC was higher than the standard deviation of accruals during the PCP. The results therefore support the claim that both income-increasing and income-decreasing earnings management increased during the GFC as compared to the PCP. Thus, the univariate test results provide support for Hypothesis 1.

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[8]More discussion is provided in section 3.2

Table 5: Change in the earnings management during GFC: Independent sample t-tests of accruals quality (Standard Deviation)

Panel A: Differences in accruals quality between the GFC and the PCP-results of bootstrapping			
	Standard Deviations (Mean)		Difference GFC vs. PCP	Independent sample t -test (t-stat) for difference in standard deviation
	GFC	PCP	GFC-PCP	GFC vs. PCP
ABSDAC1	.211	0.177	0.034	3.058***
ABSDAC2	.353	.329	0.024	2.013**
Panel B: Differences in accruals quality between the GFC and the PCP-results of bootstrapping for income increasing accruals sample			
	Standard Deviations (Mean)		Difference GFC vs. PCP	Independent sample t -test (t-stat) for difference in standard deviation
	GFC	PCP	GFC-PCP	GFC vs. PCP
ABSDAC1	0.304	0.193	0.111	15.621***
ABSDAC2	0.260	0.162	0.098	16.894***
Panel C: Differences in accruals quality between the GFC and the PCP-results of bootstrapping for income decreasing accruals sample			
	Standard Deviations (Mean)		Difference GFC vs. PCP	Independent sample t -test (t-stat) for difference in standard deviation
	GFC	PCP	GFC-PCP	GFC vs. PCP
ABSDAC1	0.365	0.278	0.087	10.69***
ABSDAC2	0.330	0.196	0.134	18.286***

***Significant at 1 percent level; **Significant at 5 percent level

$$\frac{TAC_{it}}{TA_{it-1}} = \alpha_1 \frac{1}{TA_{it-1}} + \alpha_2 \frac{\Delta REV_{it}}{TA_{it-1}} + \alpha_3 \frac{PPE_{it}}{TA_{it-1}} + \varepsilon_{it} \quad\dots\dots\dots(1)$$

$$\frac{TAC_{it}}{TA_{it-1}} = \alpha_1 \frac{1}{TA_{it-1}} + \alpha_2 \frac{\Delta REV_{it} - \Delta REC_{it}}{TA_{it-1}} + \alpha_3 \frac{PPE_{it}}{TA_{it-1}} + \alpha_4 ROA_{it} + \varepsilon_{it} \quad\dots\dots(2)$$

Where:

TAC_{it}= Total accruals (net income – cash flow from operations) for firm i at time t; TA_{it-1}= Total assets at the beginning of the year for firm i at time t; ΔREV_{it}= Change in total revenue for firm i at time t; PPE_{it}= Property, plant and equipment for firm i at time t; ΔREC_{it}: = Change in receivables for firm i at time t; ROA_{it} = Return on Assets for firm i at time t; ε_{it}= Error term (discretionary accruals component) for firm i at time t.

Un-standardized residual values in model 1 and 2 represent the discretionary accruals (DACs) or abnormal accruals, while the explained component of the models represents the non-discretionary accruals (NDAs). Absolute values of these measures are identified as ABSDAC1, ABSDAC2 in this study. The variance of the un-standardized residuals in model 1 and 2 is considered as an inverse measure of accrual quality (Dechow & Dichev, 2002; Rajgopal & Venkatachalam, 2011; Filip and Raffournier, 2014). The standard deviation of the absolute values of residuals (ABSDAC1 and ABSDAC2) from model 1 and 2 represents accruals quality. The low standard deviation of residuals is considered as high accrual quality and thus low earnings management, and the high standard deviation of residuals is considered as low accrual quality, therefore high earnings management. Following prior research (Filip and Raffournier, 2014), we calculate the standard deviation of ABSDAC1 and ABSDAC2 to compare the accruals quality between the GFC and the PCP.

5.3 Multivariate regressions results
In the previous section, we find that independent sample t-tests support Hypothesis 1. In this section, we apply firm fixed effect panel regressions to test the hypothesis in multivariate settings, controlling for the effects of other factors, and estimate models 3, 4 and 5. The results are presented

in Table 6 and Table 7. The *F*-statistics values indicate that the models are statistically significant at the 1 per cent level.[9]

The coefficients of the CRISIS variable are statistically significant and positive for both proxies of earnings management (ABSDAC1 and ABSDAC2) in models 3 and 4. These results suggest that firms' earnings management increased during the GFC compared to the PCP. In model 5, the crisis variable has a positive and insignificant coefficient. Overall, the univariate test results and the multivariate test results provide support for Hypothesis 1.

Table 6: Effect of the GFC on firms' earnings management – panel fixed effects[a]

Variable [b]	ABSDAC1	ABSDAC2
CRISIS	.077***(3.571)	.064***(3.300)
CFO	.004**(2.071)	.010***(3.655)
SIZE	.032(.638)	.019(.428)
NEG	.051 (.872)	.057(1.073)
LEV	-.001 (-.169)	-.001 (-.228)
Adjusted R-square	64.01%	61.98%
F-statistic	5.83***	5.40***
Cross-section fixed effect Chi–square	548.23***	480.26***
	503	457

[a] *t*-statistics appear in the brackets.
***Significant at the 1 per cent level; **Significant at the 5 per cent level;

$$ABSDAC_{it} = \alpha_0 + \beta_1 CRISIS + \beta_2 CFO_{it} + \beta_3 LEV_{it} + \beta_4 SIZE + \beta_5 NEG_{it} + \mu_{it} \ \ldots..(3)$$

Where, ABSDAC = absolute value of discretionary accruals for firm i during year t; CRISIS = dummy variable representing the GFC, taking the value of 1 for years 2008 and 2009, 0 otherwise; CFO = cash flows from operations for firm i during year t, divided by number of shares outstanding, to control for the effect of changes in cash flows; LEV = leverage ratio of firm i during year t, measured as total liabilities to total assets to control for the impact of debt-covenant hypothesis and financial risk on discretionary accruals; SIZE = natural log of the market value of firm i during year t, to control for the client size; NEG = indicator variable taking the value of 1 if firm i has negative earnings for year t, 0 otherwise, to control for the effect of negative economic shocks of the GFC; and μ_{it} = error terms.

Hypotheses 2, 3 and 4:
This section reports the regression results of testing three hypotheses. Hypothesis 2 states that "firms audited by Big4 auditors engaged in less earnings management during the 2008-2009 GFC than firms audited by non-Big4 audit firms." Hypothesis 3 predicts that "firms with greater audit committee independence (e.g., a higher proportion of independent members in the audit committee), engaged in less earnings management during the 2008-2009 GFC." Hypothesis 4 posits that "firms with higher proportion of audit committee members with accounting and finance expertise engaged in less earnings management during the GFC."

To examine the effect of audit quality, audit committee independence and the accounting and finance background of the audit committee members on the firms' earnings management as stated in the above hypotheses, we estimate models 4 and 5. The results are presented in Table 7.

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[9] *F*-statistic values are significant at the 1 per cent level for both proxies of earnings management.

The results in Table 7 show that the coefficient for Big4 (β_2) is significant and negative for both proxies of earnings management (ABSDAC1 and ABSDAC2), suggesting that overall the appointment of a Big4 auditor reduces earnings management. However, the interaction term CRISIS*BIG4 (β_9) in model 5 is positive and significant under both measures of earnings management, resulting in the overall coefficient of Big4 during the GFC being negative and insignificant ($\beta_2 + \beta_9$ = -0.047 and -0.105 for ABSDAC1 and ABSDAC2, respectively, with the corresponding t statistics of -0.421 and -0.869). Hence, although the appointment of a Big4 auditor reduces earnings management during normal economic conditions, this effect does not hold during the GFC. This result does not support Hypothesis 2, which states that firms audited by Big4 audit firms engaged in less earnings management during the 2008-2009 GFC than firms audited by non-Big4 audit firms.

The ACIND has a statistically significant and negative coefficient for both proxies of earnings management (ABSDAC1 and ABSDAC2) in both model 4 and model 5. These results suggest that firms with a higher proportion of independent directors in the audit committee have a significantly lower level of earnings management. The interaction term CRISIS*ACIND (β_{10}) in model 5 is positive and insignificant under both measures of earnings management, resulting in the overall coefficient of ACIND during the GFC being negative and significant ($\beta_3 + \beta_{10}$ = -0.098 and -0.163 for ABSDAC1 and ABSDAC2, respectively, with corresponding t statistics of -1.730 and -2.120). These results suggest that the presence of independent members in the audit committee significantly reduces earnings management both during the GFC and the PCP. However, the effectiveness of the audit committee members' independence in reducing earnings management is not significantly different during the GFC as compared to the PCP.

The coefficient of ACFINAC is positive and insignificant for both proxies of earnings management (ABSDAC1 and ABSDAC2) in both model 4 and model 5. These results suggest that audit committee members' accounting and finance background does not have any mitigating effect on firms' earnings management. The interaction term CRISIS*ACFINAC (β_{11}) in model 5 is negative and insignificant under both measures of earnings management, resulting in the overall coefficient of ACFINAC during the GFC being positive and insignificant ($\beta_3 + \beta_{10}$ = 0.024 and -0.018 for ABSDAC1 and ABSDAC2, respectively, with corresponding t statistics of 0.510 and 0.547). Hence, the audit committee members' accounting and finance background does not have any mitigating effect on earnings management during both the GFC and the PCP. These results suggest that firms' audit committee accounting and finance expertise (in terms of members' accounting and finance background) did not have any constraining effect on the firms' earnings management via discretionary accruals during the GFC. This finding is contrary to our hypothesis 4.

Table 7: Effect of audit quality on earnings management- panel fixed effects[a]

Variable	ABSDAC1	ABSDAC2	ABSDAC1	ABSDAC2
CRISIS (β_1)	0.0862***(3.945)	0.078***(4.001)	0.019(0.333)	0.009(0.189)
Big4 (β_2)	-0.108(-1.200)	-0.160*(-1.948)	-0.163*(-1.712)	-.190***(-2.222)
ACIND (β_3)	-0.121*(-1.862)	-0.162***(-2.944)	-0.146**(-2.153)	-.166***(-2.860)
ACFINAC (β_4)	0.031 (1.132)	0.018 (.447)	0.033 (1.105)	0.019 (0.708)
CFO (β_5)	0.003*(1.700)	0.0102***(3.377)	0.002(1.395)	0.009***(3.171)
LEV(β_6)	-0.001(-.289)	-0.0020 (-.391)	-0.003(-0.529)	-0.003 (-0.595)
SIZE(β_7)	0.037(.725)	0.025 (.584)	0.059(1.105)	0.043 (0.966)
NEG(β_8)	0.056 (.957)	0.058 (1.110)	0.032 (.538)	0.042 (0.793)
CRISIS*BIG4 (β_9)			0.116**(1.972)	0.085*(1.683)
CRISIS*ACIND(β_{10})			0.048(1.070)	0.003 (0.089)
CRISIS*ACFINAC (β_{11})			-0.009 (-.372)	-0.001(-0.021)
$\beta_2 + \beta_9$			-0.047 (-0.421)	-0.105 (-0.869)
$\beta_3 + \beta_{10}$			-0.098* (-1.730)	-0.163**(-2.120)
$\beta_4 + \beta_{11}$			0.024(0.510)	0.018(0.547)
Adjusted R-square	64.35%	63.62 %	64.75%	63.61%
F-statistics	5.79***	5.61***	5.77***	5.50***
Chi-sq			565.57***	506.68***
Number of Observations	503	457	503	457

***Significant at 1 percent level; **Significant at 5 percent level; *Significant at 10 percent level

$$ABSDAC_{it} = \alpha_0 + \beta_1 CRISIS + \beta_2 BIG4_{it} + \beta_3 ACIND_{it} + \beta_4 ACFINAC_{it} + \ldots\ldots\ldots \quad (4)$$
$$\beta_5 CFO_{it} + \beta_6 LEV_{it} + \beta_7 SIZE + \beta_8 NEG_{it} + \mu_{it}$$

$$ABSDAC_{it} = \alpha_0 + \beta_1 CRISIS + \beta_2 BIG4_{it} + \beta_3 ACIND_{it} + \beta_4 ACFINAC_{it} + \quad \ldots\ldots(5)$$
$$\beta_5 CFO_{it} + \beta_6 LEV_{it} + \beta_7 SIZE + \beta_8 NEG_{it} + \beta_9 CRISIS*BIG4_{it} + \beta_{10} CRISIS*ACIND_{it} +$$
$$\beta_{11} CRISIS*ACFINAC_{it} + \mu_{it}$$

Where,
ABSDAC = absolute value of discretionary accruals for firm i during year t; Big4 = indicator variable taking the value of 1 for firm *i* if the firm has been audited by one of the big 4 audit firms during year *t*, 0 otherwise; ACIND = Proportion of independent directors in the audit committee of firm *i* in year *t*; ACFINAC= Number of members in the audit committee of firm *i* in year *t* with accounting and finance expertise. CRISIS*Big4 = *BIG4* and *CRISIS* interaction; CRISIS*ACIND = *CRISIS* and *ACIND*it interaction; CRISIS*ACFINAC = *CRISIS* and *ACFINAC*it interaction. CRISIS = dummy variable representing the GFC, taking the value of 1 for years 2008 and 2009, 0 otherwise; CFO = cash flows from operations for firm i during year t, divided by number of shares outstanding, to control for the effect of changes in cash flows; LEV = leverage ratio of firm i during year t, measured as total liabilities to total assets to control for the impact of debt-covenant hypothesis and financial risk on discretionary accruals; SIZE = natural log of the market value of firm i during year t, to control for the client size; NEG = indicator variable taking the value of 1 if firm i has negative earnings for year t, 0 otherwise, to control for the effect of negative economic shocks of the GFC; and μ_{it} = error terms.

5.4 Robustness tests based on Propensity Score Matching (PPM) and Bootstrapping

Using matching models, we find that the treatment effect of Big4 auditor on our earnings management proxies, discretionary accruals (ABSDAC1 and ABSDAC2), are statistically insignificant during the sample periods. The results are reported in Table 8, where the estimated average treatment effect on the treated (ATT) for ABSDAC1 and ABSDAC2 are -0.009 (t = -0.466) and -0.006 (t = -0.406), respectively, suggesting an insignificant effect of Big4 on earnings management proxies during the sample period. These results corroborate with our findings of the net effects of Big4 using the fixed effect models on the full sample, which also suggest insignificant Big4 effects during the sample period.

Table 8: Results of Propensity Score Matching: treatment variable Big4

	ABSDAC1	**ABSDAC2**
Estimated Average Treatment Effect on the Treated (ATT), Big4	-0.009 ((-0.466)	-0.006 (-.406)
Average Bootstrap Estimated ATT	-0.001	-.005
Number of Bootstrap	100	100
Observations:	315	260
Treated	246	193
Control	69	67
Blocks used to test balance	6	8
Range of Calliper distance (radius) used	0.005 (0.05 produce similar results)	0.005 (0.05 produce similar results)
Matching Model R² (PSM[b])	0.353	0.353
Total number of observation	503	457

[b] Propensity Score Model

$$BIG4_{it} = \alpha_0 + \beta_1 CRISIS + \beta_2 ACIND_{it} + \beta_3 ACFINAC_{it} + \beta_4 CFO_{it} + \beta_5 LEV_{it} + \beta_6 SIZE +$$
$$\beta_7 NEG_{it} + \sum_{i=1}^{j} \rho_i Ind_i + \mu_{it} \qquad \qquad \ldots\ldots\ldots\ldots(6)$$

Where, Big4 = indicator variable taking the value of 1 for firm *i* if the firm has been audited by one of the big 4 audit firms during year *t*, 0 otherwise; ACIND = Proportion of independent directors in the audit committee of firm *i* in year *t*; ACFINAC= Number of members in the audit committee of firm *i* in year *t* with accounting and finance expertise. CRISIS = dummy variable representing the GFC, taking the value of 1 for years 2008 and 2009, 0 otherwise; CFO = cash flows from operations for firm i during year t, divided by number of shares outstanding, to control for the effect of changes in cash flows; LEV = leverage ratio of firm i during year t, measured as total liabilities to total assets to control for the impact of debt-covenant hypothesis and financial risk on discretionary accruals; SIZE = natural log of the market value of firm i during year t, to control for the client size; NEG = indicator variable taking the value of 1 if firm i has negative earnings for year t, 0 otherwise, to control for the effect of negative economic shocks of the GFC; Ind = industry dummy variables and μ_{it} = error terms.

Multivariate regressions using propensity score matched (PPM) samples (Table 9) also reveals similar results for the Big4 effect. The second and third columns in Table 9 present the regression results of the propensity score matched samples of ABSDAC1 and ABSDAC2, respectively. We find insignificant multivariate Big4 coefficients of -0.007 (t =0-0.129) and -0.029 (t = -0.684) and insignificant net effects ($\beta_3 + \beta_{10}$) of Big4 of 0.043 (t = 0.900) and -0.051(t = -1.470), respectively, for ABSDAC1 and ABSDAC2. This suggests that once client characteristics are balanced between the two clienteles (Big4 and non-Big4), the treatment effects

of Big4 auditors is insignificant with respect to the absolute value of discretionary accruals. However, we find significant negative multivariate coefficients for ACIND, representing the independence of the audit committee. The coefficients are -0.077* (t = -1.674) and -0.072* (t = -1.746), respectively, for ABSDAC1 and ABSDAC2. Although the net effects ($\beta_4 + \beta_{11}$) of ACIND are insignificant in the propensity score matched sample analyses, they have directional effects consistent with those found in the fixed effect analyses reported in Table 7.

Table 9: Effect of BIG4 (audit quality) on Earnings Management: Propensity Score Matched Sample (Matched using the Full Sample) Regression Results

Variable	ABSDAC1	ABSDAC2
Constant	-.570*** (-3.302)	-.400***(-2.707)
CRISIS (β_2)	.043 (.643)	.048 (.955)
Big4 (β_3)	-.007 (-.129)	-.029(-.684)
ACIND (β_4)	-.077* (-1.674)	-.072* (-1.746)
ACFINAC (β_5)	.026 (.986)	.010 (.536)
CFO (β_6)	-.050* (-1.842)	-.026 (-1.125)
LEV (β_7)	.002 (.331)	-
SIZE (β_8)	.120*** (3.898)	.097***(3.690)
NEG (β_9)	-.062 (-1.612)	-.041(-1.266)
CRISIS*BIG4 (β_{10})	.050 (.736)	.080 (1.384)
CRISIS*ACIND (β_{11})	.056 (.823)	.061 (1.510)
CRISIS*ACFINAC (β_{12})	.009 (.230)	-
Ind (Industry Dummies)	Included	Included
$\beta_3 + \beta_{10}$	.043 (.900)	-.051(-1.470)
$\beta_4 + \beta_{11}$	-.021 (-.190)	-.011(-1.500)
$\beta_5 + \beta_{12}$	.035 (1.270)	-
Adjusted R-square	.142	.106
F-statistics	3.00***	3.35***
Chi–square	48.24***	35.85***
Number of Observations	227	219

[a] t-statistics appear in the brackets.
*, **, *** Indicate significant at 10, 05 and 01 percent levels, respectively.

$$ABSDAC_{it} = \alpha_0 + \beta_1 CRISIS + \beta_2 BIG4_{it} + \beta_3 ACIND_{it} + \beta_4 ACFINAC_{it} +$$
$$\beta_5 CFO_{it} + \beta_6 LEV_{it} + \beta_7 SIZE + \beta_8 NEG_{it} + \beta_9 CRISIS * BIG4_{it} + \beta_{10} CRISIS * ACIND_{it} +$$
$$\beta_{11} CRISIS * ACFINAC_{it} + \sum_{i=1}^{j} \rho_i Ind_i + \mu_{it}$$

…..(7)

Where, ABSDAC = absolute value of discretionary accruals for firm i during year t; Big4 = indicator variable taking the value of 1 for firm i if the firm has been audited by one of the big 4 audit firms during year t, 0 otherwise; ACIND = Proportion of independent directors in the audit committee of firm i in year t; ACFINAC= Number of members in the audit committee of firm i in year t with accounting and finance expertise. CRISIS*Big4 = BIG4 and CRISIS interaction; CRISIS*ACIND = CRISIS and $ACIND_{it}$ interaction; CRISIS*ACFINAC = CRISIS and $ACFINAC_{it}$ interaction. CRISIS = dummy variable representing the GFC, taking the value of 1 for years 2008 and 2009, 0 otherwise; CFO = cash flows from operations for firm i during year t, divided by number of shares outstanding, to control for the effect of changes in cash flows; LEV = leverage ratio of firm i during year t, measured as total liabilities to total assets to control for the impact of debt-covenant hypothesis and financial risk on discretionary accruals; SIZE = natural log of the market value of firm i during year t, to control for the client size; NEG = indicator variable taking the value of 1 if firm i has negative earnings for year t, 0 otherwise, to control for the effect of negative economic shocks of the GFC; Ind = industry dummy variables and μ_{it} = error terms.

The main advantage of propensity-score matching is that it is usually effective at selecting observations that are closely matched in all the predictors of the propensity score. Notwithstanding the advantages of matching methods, the results of the matched samples must be interpreted with regard to the caveats of the matching models. See for example, Lawrence et al. (2011) and Minutti-Meza (2013) for a detailed discussion of the limitations of matching models. Minutti-Meza (2013, p.793) suggests that an effective alternative to matching is including client fixed-effects in the main models estimated using the full samples. This approach can mitigate the influence of unobservable client characteristics that are stable over time and impact the outcome variable. The fixed-effects model isolates the time-invariant characteristics from the predictor variables in order to assess the predictors' net effect. Therefore, we concentrate mainly on the discussion of the results from fixed effects models in the rest of the paper.

6. Discussion

The results of the univariate tests and the regression analysis support Hypothesis 1, suggesting that, on average, firms' earnings management increased during the GFC as compared to the PCP. Moreover, our separate tests for negative and positive accrual sub-samples suggest that both income decreasing earnings management and income increasing earnings management increased during the GFC. Our findings provide evidence contrary to that of Filip and Raffournier (2014), who found a decrease in earnings management in the European countries during the GFC. However, our findings about Australian firms' earnings management during the GFC are consistent with the findings of Chia et al. (2007) and Johl et al. (2007), who observed an increase in earnings management by companies in Singapore and Malaysia during the AFC. While Johl et al. (2007) did not elaborate, Chia et al. (2007) attribute the increase in earnings management by Singaporean companies to the potential financial support and benefits offered by the Singaporean government during the AFC.

The Australian government did not offer any such monetary incentives to companies. Hence there was no possibility of Australian companies receiving government support by during GFC. The most plausible explanation for the increase in income decreasing earnings management by Australian companies during the GFC is the 'big bath' hypothesis (Healy, 1985) which suggests that when firms' earnings are unexpectedly low, depriving managers of the opportunities of receiving bonuses or meeting pre-specified targets, managers will reduce current earnings by matching future potential expenses and discretionary charges to current earnings. Financially distressed firms may engage in income-reducing earnings management to use their financial difficulties to argue for import relief or antitrust clearance (DeAngelo et al., 1994). Our results also suggest that firms engaged in income increasing earnings management during the GFC. This

is consistent with managers' income smoothing objectives to compensate for the decrease of operational performance (Ahmed-Zaluki et al., 2011), to avoid a large decline of the firm's stock price that would negatively impact their compensation (Charitou et al., 2007) and to reduce the probability of debt covenant violations (Sweeney, 1994; Saleh & Ahmed, 2005; Iatridis & Kadorinis, 2009).

Interpreting our findings in light of those of Filip and Raffournier (2014) supports the argument that findings regarding firms' earnings management behaviour in one country context cannot be generalized to other countries with different levels of institutional settings and economic growth. Moreover, depending on a firm's specific condition, it may engage either in income increasing or income decreasing earnings management. Hence, different firms may find different motivations for earnings management induced by an economy-wide exogenous shock like the one of the GFC depending on their levels of earnings and their other firm-specific characteristics.

Our finding regarding the role of audit quality in mitigating firms' earnings management is contrary to the findings of previous studies by Chia et al. (2007) and Johl et al. (2007) in the context of the AFC. Chia et al. (2007) found that the appointment of a Big6 (now Big4) auditor significantly constrained the income decreasing earnings management of Singaporean firms during the 1997 AFC. Our results show that the Big4 audit firms did not have any constraining effect on earnings management by Australian firms during the GFC. It is interesting to note that the Big4 audit firms have a constraining effect on earnings management during normal economic conditions.

Why then did the Big4 auditors have no constraining effect on earnings management during the GFC, while they did during the AFC? The insignificant effect of the Big4 auditor in our study may be attributed to the differences in the institutional, legal and enforcement backgrounds of the East Asian and the South-East Asian countries from those in Australia (Leuz et al., 2003; CPA Australia, 2014). Another reason could be that our findings in this regard are based on the use of more robust methods of analysis that are capable of isolating the clients' size effect from audit quality effects, which Chia et al. (2007) did not apply. We apply one-way fixed-effects models in panel settings and propensity score matching (PPM) methods to control for the client size effect. This follows Lawrence et al. (2011), who suggest that the effects of Big4 auditor are insignificantly different from those of non-Big4 auditor with respect to three audit-quality proxies (they use), including discretionary accruals. They further suggest that the differences in the proxies between Big4 and non-Big4 auditors largely reflect client characteristics and, more specifically, client size. Insignificant Big4 effects may also be attributed to accounting conservatism. Accounting conservatism suggests timely loss recognition which increases frequent reporting of downward earning during an economic downturn. It is argued that normally auditors are less concerned about firms' income decreasing earnings management and conservative accounting by their clients due to a minimal effect of such earnings management on litigation against auditors (Zang et al., 2011; Lawrence et al., 2006). However, we have observed both income decreasing and income increasing earnings management by Australian firms during the GFC. Moreover, the fact that Big4 auditors did not constrain earnings management during the GFC although they constrained earnings management during the PCP, corroborates concerns raised by Krishnan and Zhang (2014), the PCAOB of the US, and Sikka (2009), that due to funding constraints companies had to cut audit fees during the GFC, which may have a compromising effect on audit efforts and audit quality, and therefore, on earnings management.

A striking finding is the statistically significant association between the audit committee independence and firms' earnings management behaviour during normal economic conditions and

during the GFC. The finding that the proportion of independent members in an audit committee significantly reduces earnings management by Australian firms during the GFC is new. Our findings suggest that firms with a higher proportion of independent members in the audit committee have a significantly lower level of earnings management via discretionary accruals, even during a severe financial crisis such as the GFC. To our knowledge, it is the first evidence of such an association between the variables. However, audit committee members' accounting and finance background does not appear to have constrained earnings management either during the GFC or the PCP.

These findings are consistent with prior Australian studies examining the effect of audit quality and audit committee composition on earnings management during the normal economic condition. For example, Baxter and Cotter (2009) examine the effect of the audit committee on earnings quality and find that none of the audit committee characteristics has a constraining effect on earnings quality. Davidson et al. (2005) examine the role of firms' internal governance structures in constraining firms' earnings management. They find evidence that the audit committee members' independence and board members' impendence are associated with a lower likelihood of earnings management via discretionary accruals, when discretionary accruals are measured using modified Jones model. However, they fail to find any effect of the choice of auditors and other characteristics of audit committee members in constraining earnings management via discretionary accruals.

7. Conclusion

This study empirically investigates the earnings management behaviour of Australian firms and the effectiveness of firms' audit quality, audit committee independence and audit committee members' accounting and finance expertise in mitigating such behaviour during the 2008-2009 GFC. We use univariate independent sample t-tests, accruals quality tests, multivariate cross-section fixed-effect regressions, and PPM analysis to test four hypotheses. We find that Australian firms engaged in significantly higher discretionary accrual-based earnings management during the 2008-2009 GFC than in the pre-crisis period. Along with the standard mean difference tests and fixed-effect regression analyses, we use the same accruals quality test by applying a bootstrapping method of sampling as used by Filip and Raffournier (2014). This facilitates the international comparability of our finding in this regard. We, however, find an increase in earnings management in Australia, the opposite of what Filip and Raffournier (2014), who report a decrease in earnings management in European countries during the GFC.

We find that audit quality, in terms of being audited by a Big4 audit firm as opposed to being audited by a non-Big4 audit firm, significantly constrains earnings management of Australian firms during the pre-crisis period, but not during the GFC. The effect of Big4 compared to non-Big4 is found to be insignificant in constraining firms' earnings management during the GFC. This finding is robust to the propensity score matching (PPM) method, controlling for the client size effects. Contrary to the findings of prior studies in East Asian countries during the 1997 AFC (i.e., Chia et al., 2007), our evidence indicates that audit quality had a weak effect in constraining Australian firms' discretionary accrual-based earnings management during the GFC. Their study, nevertheless, relates to the pre-IFRS institutional settings in Singapore, while our study is under the post-IFRS Australian institutional settings. To our knowledge, our study is the first to document the effect of audit quality in the context of the GFC.

Furthermore, we find that the independence of a firm's audit committee (i.e., a higher proportion of independent members in the audit committee), significantly constrains its discretionary accrual-based earnings management during both the GFC and pre-crisis periods. Although the extant literature provides evidence on the significant effects of audit committee characteristics during normal economic conditions, this is the first study to our knowledge that provides evidence on the effectiveness of audit committee independence in constraining firms' earnings management during a financial crisis, specifically during the GFC. Thus, this paper makes a unique contribution to the accounting literature by providing evidence on the statistically significant effect of the audit committee independence in mitigating earnings management behaviour of Australian firms during the GFC.

Interpreted together, these results suggest that the firm's audit committee was more effective than audit quality in constraining discretionary accrual-based earning management of Australian firms during the GFC. More specifically, firms with greater audit committee independence, had better controls on the managements' discretionary accrual-based earnings management behaviour than firms with relatively less audit committee independence.

We find no support for the accounting and finance expertise of audit committee members constraining the earnings management behaviour of Australian firms during either the GFC or the pre-crisis periods.

A key policy implication of the findings is that regulators and standard setters may need to shift their focus from the quality of a firm's auditor to encouraging well-functioning audit committees. Specific actions to promote audit committee effectiveness include mandating independence. Our findings support the importance of having independent directors in the audit committee. Moreover, the fact that Big4 auditors did not constrain earnings management during the GFC, although they constrained earnings management during the PCP, implies that regulators and policy makers should place more emphasis on the role of the audit committee's effective mitigation of earnings management during periods of macroeconomic shocks.

Users of the findings need to be cautioned, as the study is the first to consider the GFC, audit quality and audit committee characteristics, specifically in Australia. The usual caveats of empirical studies using proxy variables apply. The discretionary accruals reported in our study may be subject to estimation error like other studies in the area and may have been inflated due to the use of estimation models developed for normal economic circumstances. According to Young (1999), models for estimating discretionary accruals may contain significant measurement error due to misspecification of these accounting proxies, despite controlling for potential sources of such errors such as operating cash flows.

The current study should pave the way for future research in accounting and auditing. Future research could extend the findings of the present study by adding evidence from other GFC-affected developed and emerging economies. The present study may be extended to compare our findings with those in countries operating under code law. Moreover, testing the relative effectiveness of firms' audit quality and audit committee during normal economic conditions and crises might be another interesting area of research focus in future.

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