Board Gender Diversity and Going Concern Audit Opinions

Abstract: This study examines the relation between gender diversity on the board of directors and going concern audit opinions. The board's disclosure of inherent uncertainty in going concern supported by the auditor's going concern emphasis of matter is used as evidence of a particular governance outcome. We find that boards with at least one female director are less likely to receive a going concern opinion after controlling for the strength of corporate governance and relevant financial characteristics. This result is consistent with female directors enhancing board performance through their different perspectives and experiences to decision-making, improved monitoring, and greater risk aversion. We also test whether the appointment of a female director as board chair and the presence of a female director on the audit committee are associated with a going concern opinion. However, we do not find female participation in these roles is significant.

Keywords: board gender diversity, going concern, corporate governance.

1. Introduction

In this study, we investigate the relation between board gender diversity and whether a company receives an emphasis of matter going concern audit opinion (going concern opinion). Traditionally, the going concern opinion is used in the audit literature as a proxy for audit quality (Knechel and Vanstraelen 2008). However, we use the disclosure of the going concern as evidence of a particular corporate governance outcome, that is, avoiding the management crisis of a disagreement with the auditor about the viability of the company as a going concern. This study adds to the emerging literature that shows the incremental benefits of the appointment of female directors to company boards (Adams and Ferreira 2009; Srinidhi, Gul, and Tsui 2011; Gul, Srinidhi and Tsui 2008; Gul, Srinidhi and Ng 2011; Huang, Fornaro, and Elshhat 2011).

Gender diverse boards are more likely to avoid circumstances leading to a going concern opinion given that existing research suggests that female directors enhance board processes and risk management. For example, prior research suggests that gender diversity leads to improved board monitoring performance (Adams and Ferriera 2009; Adams, Gray, and Nowland 2010), and that women bring different perspectives, experiences and networks to the board, are ready to discuss difficult issues, engage in independent thinking, and enhance board communication (Huse and Solberg 2005; Hillman, Shropshire, and Cannella 2007; Adams and Ferreira 2009; Terjesen, Sealy and Singh 2009). In addition, there is substantial evidence that women display more risk averse behaviour in business decision-making (Powell and Ansic 1997; Jianakopolos and Bernasek 1998; Byrnes, Miller, and Schafer 1999; Barber and Odean 2001; Brooks and Zank 2005). Moreover, women on the board are associated with an increased focus on maintaining the company's reputation (Bear, Rahman, and Post 2010).

This study is motivated by an increased regulatory focus on improving the overall diversity of corporate boards. There is growing evidence globally that regulators and policy-makers think that diversity at the board level matters. For example, European countries such as Italy, Spain, Norway, the Netherlands, have mandated quotas for women on boards (Deloitte 2011). Recent changes to corporate governance guidelines in Australia and the United Kingdom include recommendations for listed companies to disclose their diversity policy and initiatives (ASX 2010; FRC 2011). In Canada, there are no quotas or recommended disclosure, but the Canadian Board Diversity Council was launched in 2009 to promote research and lobbying related to diversity practices (CBDC 2012). Despite these initiatives, limited evidence exists regarding the impact of board diversity, and there is a role for academic literature to identify where company value, efficiency or performance is enhanced by board diversity.

We contribute to the literature in a number of ways. First, this study provides new evidence on the contribution of female directors to board operation and effectiveness by examining the role of gender diversity in relation to going concern opinions. Addressing going concern reporting problems involves a situation where it is necessary for the board to provide adequate oversight of company operations. It also requires immediate and direct involvement of the board in decision-making. It is important to know whether having women on the board is associated with this decision because this it has far reaching consequences for the company.

Second, the study period leads to an important contribution. By focussing on the year 2008, we provide evidence in a period before the Australian Securities Exchange Ltd (ASX) recommended gender diversity policy reporting was implemented. This means that companies in our sample were not responding to the ASX recommendations in adopting a gender diverse board, but had voluntarily included female board members. Australian listed companies have previously had low female representation on boards, so it was difficult to undertake board diversity studies in earlier years. We are able to identify 203 boards that have female directors in 2008, which means there are sufficient data points to conduct research.

Third, the study is undertaken in the Australian setting that has different institutional, structural and cultural attributes from that of the majority of prior gender diversity studies that have considered United States (US) firms. Tronnes, Carson, and Simnett (2010) use going concern modified audit opinions to test for consistency in auditor behaviour over time and country for samples of financially distressed firms in a multi-jurisdictional study. They find modified audit opinions are less likely to have occurred in the Australian sample than the US, which highlights the importance of research being conducted in different settings.

Fourth, the study contributes to international research because the problem of designing effective governance regulations for a broad range of companies is global. Whether diversity is mandated or recommended, or encouraged through research and lobbying, it is an additional matter of governance attributes and compliance that a board must consider and report. Empirical research has a role to play in showing whether board diversity matters in an economically substantive way, rather than simply compliance. The results of this study are informative in that they provide further understanding of the role that gender diversity plays in improving corporate governance.

Finally, the study contributes to international practice because we provide evidence on the association between board and audit committee gender diversity. This is relevant to the development of hiring and training programs because it is important to identify whether males or females perform differently in alternative roles.

Training programs can be designed to overcome weaknesses and enhance strengths based on gender differences when we are informed about the association between gender diversity and performance.

We find that the companies with a female director on the board are less likely to receive a going concern audit opinion. We find that the presence of an audit committee is associated with a going concern opinion indicating that an effective internal audit process is more likely to detect going concern risks. However, we do not find this relation is strengthened by the existence of a female audit committee member.

The paper proceeds as follows. In the next section we review related literature and develop our hypotheses. This is followed by a discussion of our research method. We then present and discuss the results of our analysis. The concluding section discusses the results and their implications, and notes the limitations of the study.

2. Literature and hypotheses

Inherent uncertainty and going concern opinions

The auditor must highlight an emphasis of a matter section in the audit report when management discloses an inherent uncertainty relating to a going concern of the entity even if an unqualified opinion is provided (ISA570. ISA701, CPA Australia 2012)[1]. Therefore, the emphasis of matter opinion signals that management has identified and disclosed an inherent uncertainty as to going concern, and that the auditor concurs with this disclosure by drawing attention to it in an emphasis of a matter paragraph in the audit opinion.

An expression by management of going concern uncertainty is generally perceived as bad news. It signals that the company is uncertain as to its ability to pay its debts as and when they are due and continue operating without any intention or need to liquidate or otherwise wind up its business (ISA570.6, CPA Australia 2012). Agency theory suggests that managers are reluctant to disclose going concern uncertainties for self-interested reasons, including negative effects on the valuation of their shareholding and market reputation for future employment (Frost 1997).

There has been renewed interest in studying going concern opinions, due somewhat to the global financial crisis. Xu, Jiang, Fargher, and Carson (2011) find that the proportion of audit reports containing modifications related to going concern issues increased from 12 percent in 2005–2007 to 18 percent to 22 percent in 2008–2009 (Australian firms). The authors attribute this to the climate of uncertainty created by the global financial crisis. In

[1]ISA701 dealt with modifications to the auditor's report in 2008. The clarity standards were amended in 2010, with revisions to the categorisation of unqualified and modified reports re-written as (Australian standards) ASA700 and ASA710 (CPA Australia 2012).

a sample of audit opinions (Australian firms, 1999-2003) prior to the introduction of the current international auditing standards and prior to the global financial crisis, Herbohn and Ragunathan (2008) find that the most frequent reason (70 percent) for an emphasis of a matter opinion is going concern uncertainty.

Board gender diversity

No compelling economic theory exists to support board diversity, but in more recent times, women directors have begun to feature in board profiles. Female representation in corporate decision-making is an important issue for policymakers. In several countries regulatory initiatives have been implemented that are designed to increase female board representation (Terjesen et al. 2009). At the company level, increased gender diversity boards are likely to respond to societal pressures to conform to current norms. Legitimacy theory suggests that companies adopt practices when their operations are inconsistent, or perceived to be inconsistent, with society's norms and expectations (Scott 1995). This is particularly the case for large firms who are under increased pressure for legitimacy and are therefore more likely to have gender diverse boards (Hillman et al. 2007).

Aside from the desirability of diversity from the gender equity point of view, there is increasing evidence that board gender diversity improves board decision-making and increases shareholder value. An explanation for this association has been provided by agency and organisational theory, and studies in psychology and behavioural finance have also been informative. An agency theory explanation put forward by Adams and Ferreira (2009) is that women directors are generally not part of the *old boys club*, and are more likely to align with the independence characteristic recommended by corporate governance codes. This suggests that female directors enhance board governance in a similar manner to the beneficial oversight provided by independent directors.

Many studies refer to organisational theory in proposing that female directors make an incremental contribution to the quality of board decisions. Organisational theory suggests this is because women bring different perspectives, experiences and networks to the board; are ready to discuss difficult issues; engage in independent thinking; and, enhance board communication (Huse and Solberg 2005; Hillman et al. 2007; Adams and Ferreira 2009; Terjesen et al. 2009).

Research in psychology and behavioural finance has also lead to a sustained proposition that women are generally risk averse in business decision-making contexts. A substantial body of literature indicates there is a difference in the propensity for risk taking behaviour between males and females. In a meta-analysis of 150 studies from the psychology literature between 1967 and 1994, Byrnes, Miller, and Schafer (1999) conclude, "at a general level, our results clearly support the idea that male participants are more likely to take risks than female

participants" (Byrnes et al. 1999: 377), and that males are more likely to take a risk "even when it was clear that it was a bad idea to take a risk" (Byrnes et al. 1999: 378). Several studies have considered the relation between risk averse behaviour in investment decisions and have found that males have a greater propensity for risk-taking and overconfidence (Barber and Odean 2001: Jianakopolos and Bernasek 1998; Brooks and Zank 2005).

Board gender diversity and performance outcomes

Prior research focuses on specific aspects of corporate operations to investigate whether gender diverse boards make better decisions leading to better performance. Gender diversity in top management[2] is positively associated with earnings quality (Krishnan and Parsons 2008). Srinidhi et al. (2011) find that greater female board participation is associated with higher earnings quality, and they conclude that this reflects an improved level of oversight resulting from the presence of female directors.

Board gender diversity has been found to improve the quality of non-financial company disclosures. For example, Bear et al. (2010) find a positive relation between the number of female directors and the strength of corporate social responsibility disclosures.

Prior studies demonstrate a positive capital market response to board gender diversity. Gul et al. (2011) find stock prices reflect more firm specific information when the firm has a gender diverse board. They attribute this to gender diversity leading to improved transparency (enhanced internal board discussion and external communication), better oversight of disclosure and reporting, and less likelihood of the exploitation of private information. Huang et al. (2011) provide evidence that the market reacts positively to the appointment of a female director on the audit committee. They find a greater positive abnormal market return for female appointments compared to male audit appointments for a sample of US companies from 2002 to 2009.

Gul, Srinidhi and Tsui (2008) find that higher audit fees are paid by firms with diverse boards, and suggest this is evidence of improved focus on monitoring by female directors. A later study by Ittonen, Kurtii, and Vahamaa (2010) shows a negative relationship between audit fees and the presence of a female audit committee chair. The increased monitoring prompted by the female audit committee chair, it is argued, improves the effectiveness of internal controls, reduces the likelihood of misstatements and assurance needed by external auditors.

[2] "Top management" is defined as personnel with responsibility for corporate operations that could legally bind the company, and represent the company in major-decisions. Their analysis uses a sample of Fortune 500 firms between 1996 and 2000 and several earnings quality measures are positively associated with gender diversity.

Adams and Ferreira (2009) consider the relation between gender diversity and various aspects of board performance and company operations for US firms. For board performance they report that female directors have better board meeting attendance, and that their presence is associated with better overall attendance. Female directors are likely to play an active monitoring role by joining board committees, and are associated with sensitivity of chief executive officer (CEO) turnover to market performance. Interestingly, Adams and Ferreira (2009) report a negative relation between female directors and performance measured by return on assets and Tobin's Q. However, they find that this relation is moderated when female directors are present on boards that have overall weak governance characteristics.

A positive association has been found between board gender diversity and market performance measured by the market-to-book ratio (Bonn, Yoshikawa and Phan 2004) and a positive relation with firm market value (Nguyen and Faff 2006-2007) in studies using similar Australian data to this study. Bonn et al. propose that gender diverse boards deal more effectively with diversity in their product and labour markets and are able to gain competitive advantage over their rivals. In contrast, Wang and Clift (2009) do not find a significant relation between board gender diversity for the top 500 Australian companies and performance measures including return on assets, return on equity and shareholder return.

Moving away from board diversity to chief financial officer (CFO) characteristics, Barua, Davidson, Rama, and Thiruvedi (2010) examine the relation between CFO gender and accruals quality and find companies with a female CFO have better quality accruals. They argue this is consistent with evidence from prior studies that show women are more cautious and less aggressive in a variety of business and finance settings (Huang and Kisgen 2008).

Hypotheses

A going concern opinion indicates that there is an aspect of company operations that is a substantial risk to the continuance of its business. Generally, a going concern opinion signals company financial distress, and there is evidence of a strong relation between going concern opinions and eventual company bankruptcy (Altman and McGough 1974; Hopwoood, McKeown, and Mutchler 1994; Mutchler, Hopwoood, and McKeown 1997). We suggest that board decision-making in the context of going concern problems is a setting where women can contribute effectively in their role as a board member.

Recall that organisational theory supports that female directors make an incremental contribution to the quality of board decisions. This is supported by studies that show gender diversity on the board is associated with

improvement in various board performance measures including the enhancement of monitoring, improved communication, and willingness to address difficult issues. Companies with better board monitoring are more likely to identify substantial operational problems in a timely manner. Moreover, better board communication and willingness to address difficult issues increases the likelihood of resolution of problems that, if not addressed, result in going concern problems. The behavioural finance literature, which shows females are more risk averse financial decision-makers, also indicates that a gender diverse board mitigates the likelihood of a company experiencing going concern problems. We therefore test the following hypothesis:

HYPOTHESIS 1: *Companies with a gender diverse board receive fewer going concern audit opinions.*

In addition to board diversity, we also examine audit committee gender diversity. The audit committee operates to enhance the integrity of company financial reporting. Greater integrity in financial reporting ensures that the board of directors is informed of potential going concern problems in a timely manner and manage potential going concern problems. The audit committee also plays an important role in ensuring the quality and independence of the external audit. In addition, oversight of financial reporting by the audit committee increases the likelihood of directors and auditors reaching consensus about going concern risks. We expect that the appointment of female directors to the audit committee enhances performance of the committee through better monitoring, improved communication, and willingness to address difficult issues, and risk averse behaviour. The following hypothesis is therefore tested:

HYPOTHESIS 2: *Companies with a gender diverse audit committee receive fewer going concern audit opinions.*

3. Research method

Sample and data

The sample for this study consists of listed Australian companies in 2008 that have a 30 June balance date. In Australia, board gender diversity is not mandated. It is recommended in the 2010 ASX disclosure guidelines on corporate governance that companies disclose their gender diversity policies. Our study is prior to the release of this recommendation. Therefore, our sample consists of companies that have voluntarily adopted diversity in board composition.

We exclude from the sample companies that operate as trusts because of their unique governance characteristics. The sample is reduced due to missing data, leaving a final sample of 1182 companies. Some 144 companies from the sample have reported a going concern uncertainty supported by the auditor's going concern opinion. Corporate governance and gender diversity data is hand collected from company annual reports. Financial

data is obtained from the Aspect Huntley FinAnalysis database.

Statistical analyses

Our hypotheses are tested by logistic regression analysis, which is a suitable analysis technique given the dichotomous independent variable (Hosmer and Lemeshow, 1989). Equations 1 to 3 below show the variables used in our main analyses. Model 1 and Model 2 test whether the existence of a gender diverse board is related to a company receiving a going concern opinion (Hypothesis 1). Model 1 includes a variable that indicates whether the company has at least one female director on the board. Model 2 includes a variable to test the incremental association of the appointment of a female director as board chair. Model 3 tests whether a gender diverse audit committee is related to a company receiving a going concern opinion (Hypothesis 2) by including an indicator variable when the company has at least one female director on the audit committee. The dummy variable for the existence of an audit committee is removed from Model 3.

$$\textit{Model 1: Going concern opinion} = f(\beta_0 + \beta_1 \textit{Female director} + \beta_2 \textit{Experienced directors} + \beta_3 \textit{Proportion of independent directors} + \beta_4 \textit{Dual CEO/board chair} + \beta_5 \textit{Board engagement} + \beta_6 \textit{Big 4 auditor} + \beta_7 \textit{Audit committee} + \beta_8 \textit{Block shareholding} + \beta_9 \textit{Age} + \beta_{10} \textit{Net interest cover} + \beta_{11} \textit{Size} + \beta_{12} \textit{Leverage} + \beta_{13} \textit{Z score} + \beta_{14} \textit{CEO change} + \textit{Industry dummies} + e) \quad (1)$$

$$\textit{Model 2: Going concern opinion} = f(\beta_0 + \beta_1 \textit{Female director not chair} + \beta_2 \textit{Female chair} + \beta_3 \textit{Experienced directors} + \beta_4 \textit{Proportion of independent directors} + \beta_5 \textit{Dual CEO/board chair} + \beta_6 \textit{Board engagement} + \beta_7 \textit{Big 4 auditor} + \beta_8 \textit{Audit committee} + \beta_9 \textit{Block shareholding} + \beta_{10} \textit{Age} + \beta_{11} \textit{Net interest cover} + \beta_{12} \textit{Size} + \beta_{13} \textit{Leverage} + \beta_{14} \textit{Z score} + \beta_{15} \textit{CEO change} + \textit{Industry dummies} + e) \quad (2)$$

$$\textit{Model 3: Going concern opinion} = f(\beta_0 + \beta_1 \textit{Female director not on audit committee} + \beta_2 \textit{Female audit committee member} + \beta_3 \textit{Experienced directors} + \beta_4 \textit{Proportion of independent directors} + \beta_5 \textit{Dual CEO/board chair} + \beta_6 \textit{Board engagement} + \beta_7 \textit{Big 4 auditor} + \beta_8 \textit{Block shareholding} + \beta_9 \textit{Age} + \beta_{10} \textit{Net interest cover} + \beta_{11} \textit{Size} + \beta_{12} \textit{Leverage} + \beta_{13} \textit{Z score} + \beta_{14} \textit{CEO change} + \textit{Industry dummies} + e) \quad (3)$$

Variables

Dependent variable

At the time of the study, the framework of audit opinions permitted five different types of audit opinion. The first, an unqualified opinion, shows that the auditor agreed that the financial accounts were true and fair (ISA700, CPA Australia 2012). The remaining modified opinions are referred to in ISA 701(CPA Australia 2012) as emphasis of a matter, qualified, adverse, or disclaimer. This study examines an emphasis of a matter going concern opinion that the directors have identified. Hence, it is important to note that there are other reasons why an emphasis of a matter is given, that do not relate to inherent uncertainty as to going concern. Further, as noted by Herbohn and Ragunathan (2008), there are other qualified opinions relating to a going concern that the directors do not report. The dependent variable is a dummy variable that is coded one (1) if the company receives a going concern opinion and zero (0) otherwise.

Independent variables

Our first test of the relation between board gender diversity and likelihood of a going concern opinion includes a dummy variable coded one (1) for the existence of at least one female director on the board of directors, and zero (0) otherwise.

We also test whether there is an incremental association related to existence of a female as the board chairperson. For this analysis, we include a dummy variable coded one (1) for the existence of a female director that is not the board chair, and zero (0) otherwise. Another dummy variable is included in the analysis that is coded one (1) if the company has a female board chair and zero (0) otherwise.

Analysis of audit committee gender diversity proceeds by including a dummy variable that is coded one (1) for the existence of a female director who is not on the audit committee and zero (0) otherwise. Another dummy variable is included that is coded one (1) if the company has a female audit committee member, and zero (0) otherwise.

Control variables

We include controls for corporate governance strength, as we are interested in the incremental governance monitoring provided by gender diversity. The governance control variables are: the proportion of independent directors, the existence of a dual CEO board chair, the level of board engagement as indicated by the number of meetings, whether the firm has engaged a Big 4 audit firm (Francis and Krishnan 1999; Franco, Gavious, Jin, and Richardson 2011), whether the firm has formed an audit committee, and the existence of concentrated shareholding (Carcello, Neal, Palmrose, and Scholz 2011).

Financial characteristics are associated with a going concern opinion and we include three measures that relate to financial health: insolvency risk estimated by the Altman (1968) Z score measure[3], leverage and a measure of interest cover (Bartov and Bodnar 1996). We also include controls for company size and the experience of the board members as indicated by the number of their external directorships (Ferris, Jagannathan, and Pritchard 2003; Carcello et al. 2011; Haw, Ho, and Yuansha 2011; Johnstone, Chan, and Rupley 2011) consistent with prior studies that have considered the role of gender diversity (Adams and Ferreira 2009). Carcello and Neal (2000) provide evidence that companies in the development phase of their life cycle are less likely to receive a going concern opinion. While the financial statements of these companies can indicate financial distress, Carcello and Neal (2000: 456) suggest this is viewed by the auditor as a symptom of the company's stage in its life cycle rather than an indicator of impending financial failure. Therefore, we include company age as a control.

Finally, we control for a recent change of CEO, as this is likely to be associated with an increased disclosure of going concern problems that are attributable to previous company management (Weili, Matsumoto, and Zhang, 2011). Table 1 provides a description of all variables included in the analyses.

Table 1 about here

4. Results

Descriptive statistics and univariate tests

Descriptive statistics for the sample of companies are presented in Table 2. Panel B of Table 2 shows that at least one female director was present on 17.17 percent of the boards of our sample companies (203 of 1182 companies). Only a very small percentage of female directors are appointed to the board chair position (1.10 percent). The representation of females on the audit committee is 7.45 percent, which is lower than the level of female representation on the board.

Panel C of Table 2 shows the industry representation in our sample, and the extent of female board representation by industry sector. The materials sector is the largest industry grouping for our sample (39.26 percent) and it has the lowest rate of female board representation at 9.70 percent. In addition, the energy sector, which includes 13.03 percent of the sample, also has low female board representation at 13.64 percent. The consumer discretionary industry sector (9.14 percent of the sample) has the highest rate of female board

[3] Z Score = (1.20 x ((current assets-current liabilities) ÷ total assets)) + (1.40 x (retained earnings ÷ total assets)) + (3.30 x (earnings before interest and taxes ÷ total assets) + (0.60 x (market capitalisation ÷ total liabilities)) + (0.99 x operating revenue ÷ total assets). The derived score was winsorised at 1 percent, and the largest negative value added to the score for each case so that the variable had a positive range.

representation at 31.48 percent. The analysis shows a substantial variation in female board involvement across industries. In addition, the relatively low level of gender diversity for Australian companies is partly attributable to very low levels of representation in large industry sectors; in particular, the materials sector. Panel D of Table 2 shows that the majority of gender diverse boards had only one female director (83.25 percent). Of the 5615 directors in the sample only 242 were female (4.31 percent). Thus, we find that board gender diversity is low for Australian companies compared to the US where many of the prior studies have been conducted (Adams and Ferreira 2009).

Table 2 about here

Table 3 reports correlations for the independent variables included in the logistic regression analyses. The high correlation between the existence of a female director on the board and a female director on the audit committee (r=0.68) shows female directors are frequently appointed to the audit committee. The magnitude of correlations does not raise concerns about multicollinearity for the logistic regression analyses conducted (Tabachnick and Fidell 1996). For variables included together in the logistic regression models, a high correlation of r=0.45 is observed between size and the existence of a Big 4 auditor. To determine the affect of this correlation on results preliminary logistic regression analyses are run with and without the Big 4 auditor variable. The results were unchanged, indicating the reported regression coefficients were not biased by collinearity problems.

Table 3 about here

Univariate tests of differences in the independent variables between companies that received a going concern opinion and those that did not are presented in Table 4. The results show that the characteristics of the two groups are systematically different. The female director variable is significantly different between the groups (at p<0.01). Of going concern opinion companies, 9.72 percent had a female director compared to 18.21 percent for the non going concern opinion companies. The female chair and female audit committee variables were marginally significantly different (at p<0.10). Only 1.00 percent of going concern companies had a female chair, compared to 2.78 percent for non going concern companies. For the audit committee, 3.47 percent of going concern companies had a female audit committee member compared to 7.90 percent for non going concern companies. The difference is marginally significant at p<0.10.

The results of univariate tests for governance controls show that companies with governance structures that enhance monitoring are less likely to receive a going concern opinion. Compared to going concern companies, non going concern companies had a significantly greater proportion of independent directors; more frequently

engaged Big 4 audit firms; had more concentrated shareholding; and, had a greater proportion of experienced directors on their board (all at $p<0.01$).

Size, leverage and Z score variables were significant (at $p<0.01$) for the financial control variables included in the analysis. Compared to going concern companies, the non going concern companies were larger, had lower leverage, and had a lower insolvency risk as indicated by the Z score variable.

Table 4 about here

Multivariate tests

Table 5 presents analyses that test the association between the existence of female directors and a going concern audit opinion. Regression models include variables for participation by a female on the board of directors (Model 1), the existence of a female board chair (Model 2), and the appointment of a female director to the audit committee (Model 3).

Table 5 about here

Model 1 includes the dummy variable for the existence of a female director on the board. The variable is significant at $p<0.05$ and the coefficient is negative. This shows that the presence of a female director on the board reduces the likelihood of a going concern opinion. Therefore, board gender diversity is incrementally beneficial to the oversight provided by formal and informal governance mechanisms. This result supports Hypothesis 1 that companies with a gender diverse board are less likely to receive a going concern opinion.

For the governance control variables included in Model 1, the proportion of independent directors, the existence of experienced directors on the board, and the level of block shareholding are significant and negatively associated with a going concern opinion (all at $p<0.01$). The audit committee variable is significant ($p<0.05$), and is positively associated with a going concern opinion, indicating that an audit committee encourages directors to disclose any going concern uncertainties.

For the financial controls, size and leverage are significant at $p<0.01$ and $p<0.05$ respectively. Size has a negative coefficient, which shows that larger companies are less likely to receive a going concern opinion. Leverage has a positive coefficient, which shows that companies with higher leverage are more likely to receive a going concern opinion. The Z score variable is significant at $p<0.01$ and, as expected, the coefficient is negative. Thus, the likelihood of a going concern audit opinion is increasing with the risk of financial failure. We also find that the dummy variable for change in CEO is marginally significant (at $p<0.10$) and has a positive coefficient.

This is consistent with the finding of Weili et al. (2011) that new managers tend to disclose going concern problems that can be attributed to prior company management.

Model 2 in Table 5 includes an indicator variable for the existence of a female board chair. While the female director variable remains significant, the female board chair variable was not significant. This shows the appointment of a female board chair does not have an incremental association with a going concern opinion. However, the result must be interpreted with caution given the very small percentage of female directors that are appointed as board chair in the sample. The results for the control variables are substantively the same as those reported for Model 1 above.

Model 3 in Table 5 reports results for analysis of the association between the existence of a female director on the audit committee and a going concern audit opinion. The existence of a female director on the audit committee has no incremental association with the likelihood of a going concern audit opinion. Thus, we do not find support for Hypothesis 2 that companies with a gender diverse audit committee are less likely to receive a going concern audit opinion.

5. Additional analysis

Because of the strong association between bankruptcy risk and a going concern audit opinion, a sub-sample of companies with high insolvency risk as indicated by their Z score is selected for additional analysis. Companies included in this analysis had an Altman Z score of below 2.99, which is considered the threshold score between healthy and distressed companies (Altman 1968).[4] The unreported results were substantively the same as those for the full sample.

We also test the robustness of the results to selection bias problems by using a Heckman (1976) adjustment procedure. This analysis controls for the possibility that companies with better governance are more likely to have a gender diverse board of directors. We calculate the inverse Mills ratio using the predicted value of a Probit model that has the existence of a female on the board of directors as the dependent variable. The Probit model includes governance variables that measure board independence, the formation of an audit committee, the engagement of a Big 4 auditor and concentrated shareholding. In addition, following Srinidhi et al. (2011), we include measures of return on assets, age, size, experienced directorships and industry in our prediction model. All of the included variables are defined in Table 1. The Probit model is:

[4]The equivalent value on our adjusted scale for the Altman (1968) Z was 59.28.

$$Female\ director = f(\beta_0 + \beta_1 Proportion\ of\ independent\ directors + \beta_2 Dual\ CEO/board\ chair + \beta_3 Big\ 4\ auditor + \beta_4 Audit\ committee + \beta_5 Block\ shareholding + \beta_6 Size + \beta_7 Return\ on\ assets + \beta_8 Age + \beta_9 Experienced\ directors + Industry + e) \quad (4)$$

The regression for female board participation was run with the inverse Mills ratio included as an independent variable (denoted as Lambda). We find that the results are substantively the same as those presented for the main analysis (see Table 6).

An alternative method to controlling for selection bias is the matched propensity score method (Rosenbaum and Rubin 1983), which involves matching companies with and without female board representation based on the predicted probabilities of a model that estimates the likelihood of female board representation. A matched sample was determined using the predicted probabilities from Equation 4 above. We found that the matched propensity score method resulted in a substantial reduction in sample size due to poor matching for several companies. The regression for female board participation was run using the matched sample, and the results reported in Table 6 are substantively the same as those presented for the main analysis.

Finally, the regression for female board participation was run using a sample of companies that had received a going concern audit opinion in 2007 and 2008. Receiving a going concern opinion in two consecutive years suggest the sub-sample of companies is experiencing entrenched going concern problems. Again, the results are substantively the same as those presented for the main analysis (see Table 6).

6. Conclusion

This paper examined the relation between gender diversity on the board of directors and the likelihood that a company receives a going concern audit opinion. Diversity on the board and the audit committee is examined. The going concern opinion is a particular manifestation of a management crisis – the board has decided there is a material uncertainty relating to operations and has disclosed this to stakeholders. We find that, after controlling for the strength of corporate governance and relevant financial characteristics, boards with at least one female director are less likely to receive a going concern opinion. The different perspectives and experiences of female directors, their propensity for independent thinking, and their enhancement of board communication are likely to reduce the risk that company operations deteriorate to the point that a substantive going concern problem arises. The findings are consistent with the view that gender diversity improves board performance because of the qualities of female directors. Overall, our results are consistent with other studies that have reported differences in men and women in decision-making contexts.

We find that the presence of an audit committee is associated with an increased likelihood of a going concern opinion although gender diversity is not significant. This is indicative of the important role of the audit committee in relation to the integrity of financial reporting. While the reporting of going concern problems is a negative signal that the board undoubtedly wishes to avoid, the existence of an audit committee ensures transparency in reporting. However, we do not find that this relation is strengthened by the existence of a female audit committee member.

Boards have to consider their diversity profile because of increasing regulatory focus on improving the overall diversity of corporate boards. Our finding that the appointment of female directors enhances board performance adds to the existing evidence that justifies a policy approach of encouraging gender diverse board composition. The findings show that in addition to the promotion of gender equity, this policy approach is economically important in that it leads to improved board performance.

There are several limitations to the study. First, the cross-sectional data used in the analysis limits the generalisability of the results. This could be improved by conducting studies using company year analysis. However, the difficulty in this regard is obtaining the necessary corporate governance data, which largely needs to be manually collected from company annual reports. Another concern is that while we have controlled for governance characteristics and applied a Heckman (1976) adjustment in robustness tests of the results, there may be omitted variable and endogeneity problems that could undermine the reported results. Notwithstanding these limitations, this study represents an important contribution in that it examines the issue of board gender diversity in a new institutional setting, and for an economic event (going concern problems and their disclosure) that represents a critical problem for the board.

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TABLE 1
Variable Definitions

Dependent Variables	**Measure**
Audit opinion	Dummy variable, coded 1 if the company had an emphasis of matter going concern audit opinion
Independent Variables	
Gender	
Female director	Dummy variable, coded 1 if the board of directors has one female member, 0 otherwise
Female chair	Dummy variable, coded 1 if the board chair is a female, 0 otherwise
Female audit committee member	Dummy variable coded 1 if a female director is a member of the audit committee, 0 otherwise
Female director not CEO	Dummy variable, coded 1 if the board of directors has a female member that is not the CEO, 0 otherwise
Female director not chair	Dummy variable, coded 1 if the board of directors has a female member that is not the board chair, 0 otherwise
Female director not member of audit committee	Dummy variable, coded 1 if the board of directors has a female member that is not on the audit committee, 0 otherwise
Control Variables	
Experience	
Experienced directors	Number of board appointments held by the company's directors
Financial	
Size	Natural log of total assets
Leverage	Total liabilities divided by total assets
Age	Number of years since the company was listed as at 2008
Net Interest cover	Earnings before interest and tax divided by interest expense
Z score	Altman (1984) Z score, winsorised at 1 percent, adjusted to a positive range.
Governance	
Proportion of independent directors	Number of independent directors divided by the total number of directors. Independent directors were identified in accordance with the ASX recommendations (ASX, 2007)
Dual CEO/board chair	Dummy variable coded 0 if the chair of the board of directors is also the company CEO, 1 otherwise
Audit committee	Dummy variable coded 1 if the company's board of directors has formed an audit committee, 0 otherwise
Board engagement	Number of board meetings held in the 2008 financial year
Big 4 auditor	Dummy variable coded 1 if the company has engaged a Big 4 auditor, 0 otherwise
Share Ownership	
Block shareholding	Percentage of shares held by members with 5 percent or more of the company's issued ordinary shares
Other	
Industry	Dummy variable, industry group based on GICS sector
CEO change	Dummy variable code 1 if there was a change in CEO in either 2007 or 2008, 0 otherwise

TABLE 2
Descriptive Statistics

Panel A: Descriptive statistics of continuous variables

Variable	Mean	St. Dev.	Min.	Median	Max.
Experienced directors	5.93	4.85	0.00	5.00	35.00
Proportion of independent directors	0.46	0.26	0.00	0.50	1.00
Board engagement	9.88	4.54	0.00	10.00	33.00
Block shareholding	0.38	0.22	0.00	0.37	1.00
Age	10.20	10.77	0.51	6.48	123.00
Net interest cover	9.41	227.28	-3296.91	5.18	3887.00
Size	17.28	2.03	11.76	16.99	25.09
Leverage	0.46	4.36	0.01	0.20	156.98
Z score	75.30	44.01	0.00	60.93	346.47

Panel B: Descriptive statistics of dichotomous variables

Variable	Yes %
Female director	17.17
Female chair	1.10
Female audit committee member	7.45
Dual CEO board chair	15.91
Big 4 Auditor	41.03
Audit Committee	71.40
CEO Change	6.68

Panel C: Industry

Industry Classification	Sample %	Female Director %
Consumer Discretionary	9.14	31.48
Consumer Staples	2.79	24.24
Energy	13.03	13.64
Financials	3.55	30.95
Healthcare	9.65	28.95
Industrials	12.61	16.78
Information Technology	6.60	21.80
Materials	39.26	9.70
Telecommunications	1.78	14.29
Utilities	1.61	21.05
Panel D: Female directors		
Female directors = 1	83.25%	
Female directors = 2	14.78%	
Female directors = 3	1.48%	
Female directors = 4	0.49%	
Number of female directors	242.00	
Number of directors	5615.00	

Notes: Variables are defined in Table 1.

TABLE 3
Correlation Matrix

	Female director	Female chair	Female audit committee member	Experienced directors	Proportion of independent directors	Dual CEO/board chair	Board engagement	Big 4 auditor	Audit committee	Block shareholding	Age	Net interest cover	Size	Leverage	Z score
Female chair	***0.25														
Female audit committee member	0.68	***0.21							-						
Experienced directors	***0.15	0.20	0.20												
Proportion of independent directors	***0.14	0.03	***0.16	***0.19											
Dual CEO/board chair	-0.04	-0.02	-0.03	***-0.09	***-0.15										
Board engagement	***0.09	***0.08	***0.10	0.03	***0.13	***-0.11									
Big 4 auditor	***0.16	0.02	***0.14	***0.25	***0.20	***-0.09	***0.14								
Audit committee	***0.13	0.03	***0.18	***0.16	***0.26	***-0.17	***0.24	***0.26							
Block shareholding	***0.08	0.01	0.02	0.01	**-0.06	0.03	**0.05	***0.12	***0.14						
Age	***0.10	-0.02	0.02	***0.11	***0.09	0.04	0.02	***0.16	***0.08	***0.08					
Net interest cover	-0.02	-0.01	-0.01	-0.04	-0.01	-0.01	-0.03	-0.04	-0.03	-0.02	-0.01				
Size	***0.22	0.02	***0.22	***0.36	***0.24	***-0.12	***0.23	***0.45	***0.39	***0.24	***0.25	0.02			
Leverage	0.01	-0.01	0.01	-0.04	-0.01	-0.01	-0.04	-0.02	-0.03	***0.09	***0.10	***0.13	***-0.11		
Z score	-0.01	0.05	-0.06	**-0.07	0.05	0.03	0.05	0.04	***0.09	0.02	0.03	-0.05	-0.06	***-0.25	
CEO change	***0.11	***0.13	0.08	***0.07	***0.09	**-0.06	***0.09	**0.10	***0.09	**0.07	0.02	-0.01	***0.11	-0.01	***0.08

Notes : Variables are defined in Table 1; *** and ** represent significance levels of 0.01 and 0.05 respectively.

TABLE 4
Univariate Statistical Tests

Variable	GC Opinion Mean or %	Non GC Opinion Mean or %	*t* statistic	Chi-square
Female director	9.72%	18.21%		***6.40
Female chair	1.00%	2.78%		*4.24
Female audit committee member	3.47%	7.90%		*3.64
Experienced directors	4.08	6.10	***6.73	
Proportion of independent directors	0.40	0.47	***3.01	
Dual CEO/board chair	16.67%	15.80%		0.07
Board engagement	10.19	9.83	-0.90	
Big 4 auditor	26.39%	43.06%		***14.53
Audit committee	71.97%	67.36%		1.31
Block shareholding	0.29	0.39	***5.86	
Age	9.35	10.32	1.25	
Net interest cover	8.30	9.57	0.06	
Size	15.79	17.49	***12.32	
Leverage	1.77	0.29	***3.97	
Z score	62.37	77.09	***4.35	
CEO change	8.33%	6.46%		0.72

Notes : Variables are defined in Table 1.***, ** and * represent significance levels of 0.01, 0.05, and 0.10, respectively.

TABLE 5
Logistic Regression – Female Board Participation and Going Concern Audit Opinions (*n*=1182)

	Model 1		Model 2		Model 3	
Variable	**Coefficient**	**Wald**	**Coefficient**	**Wald**	**Coefficient**	**Wald**
Constant	8.75	***37.13	8.78	***37.14	8.77	***37.28
Female director	-0.56	**2.74				
Female director not chair			-0.82	**4.49		
Female chair			0.94	1.37		
Female director not on audit committee					-0.62	*2.29
Female audit committee member					-0.41	0.56
Experienced directors	-0.07	***5.55	-0.07	***5.23	-0.07	***5.55
Proportion of independent directors	-1.01	***6.65	-1.04	***6.91	-1.02	***6.74
Dual CEO/board chair	-0.20	0.50	-0.21	0.56	-0.20	0.49
Board engagement	0.05	***6.15	0.05	**4.77	0.06	***6.13
Big 4 auditor	-0.15	0.39	-0.13	0.32	-0.15	0.39
Audit committee	0.41	**2.87	0.43	**3.22		
Block shareholding	-1.82	***12.26	-1.80	***11.89	-1.81	***12.19
Age	0.01	1.08	0.01	1.28	0.01	1.09
Net interest cover	0.01	0.01	0.01	0.01	0.01	0.01
Size	-0.55	***43.08	-0.55	***42.09	-0.55	***43.17
Leverage	0.52	**3.90	0.50	**3.67	0.52	**3.91
Z score	-0.01	***6.46	-0.01	***6.84	-0.01	***6.42
CEO change	0.57	*2.06	0.45	1.24	0.56	*2.04
Chi-square model fit	***189.27		***192.93		***189.26	
Nagelkerke pseudo R square	0.28		0.29		0.28	

Notes: Variables are defined in Table 1. Industry variables are not reported. ***, ** and * represent significance levels of 0.01, 0.05, and 0.10, respectively.

Model 1*: Going concern opinion = f (β_0 + β_1Female director + β_2Experienced directors + β_3Proportion of independent directors + β_4Dual CEO/board chair + β_5Board engagement + β_6Big 4 auditor + β_7Audit committee + β_8Block shareholding + β_9Age + β_{10}Net interest cover + β_{11}Size + β_{12}Leverage + β_{13}Z score+ β_{14}CEO change + Industry dummies + e)*

Model 2*: Going concern opinion = f (β_0 + β_1Female director not chair + β_2Female chair + β_3Experienced directors + β_4Proportion of independent directors + β_5Dual CEO/board chair + β_6Board engagement + β_7Big 4 auditor + β_8Audit committee + β_9Block shareholding + β_{10}Age + β_{11}Net interest cover + β_{12}Size + β_{13}Leverage + β_{14}Z score + β_{15}CEO change + Industry dummies + e)*

Model 3*: Going concern opinion = f (β_0 + β_1Female director not on audit committee + β_2Female audit committee member + β_3Experienced directors + β_4Proportion of independent directors + β_5Dual CEO/board chair + β_6Board engagement + β_7Big 4 auditor + β_8Block shareholding + β_9Age + β_{10}Net interest cover + β_{11}Size + β_{12}Leverage + β_{13}Z score + β_{14}CEO change + Industry dummies + e)*

TABLE 6
Logistic Regression – Female Board Participation and Going Concern Audit Opinions

	Heckman Adjusted Model (*n*=1182)		Propensity Score Model (*n*=342)		Going Concern Opinion in 2007 and 2008 (*n*=838)	
Variable	**Coefficient**	**Wald**	**Coefficient**	**Wald**	**Coefficient**	**Wald**
Constant	38.15	***7.21	7.93	***7.65	7.27	***8.13
Female director	-0.58	**2.87	-0.80	**2.75	-2.50	**4.53
Experienced directors	-0.21	***8.23	-0.12	**2.76	-0.11	**2.89
Proportion of independent directors	-4.73	***6.68	1.16	1.16	-1.15	*2.14
Dual CEO/board chair	-0.29	1.06	-2.81	**4.29	0.27	0.31
Board engagement	0.05	***5.69	0.14	***9.06	0.02	0.14
Big 4 auditor	-1.34	**4.64	-0.31	0.30	-0.33	0.61
Audit committee	0.04	0.02	0.03	0.01	0.67	*1.87
Block shareholding	-3.36	***13.65	-2.76	**4.30	-2.38	***5.50
Age	-0.02	0.89	0.01	0.20	-0.01	0.01
Net interest cover	0.01	0.01	0.01	0.10	0.01	0.26
Size	-1.17	***14.30	-0.68	***12.55	-0.34	**4.21
Leverage	0.37	*1.83	2.22	***10.30	0.01	0.01
Z score	-0.01	**5.54	0.01	*1.72	-0.03	***7.48
CEO change	0.52	1.74	0.24	0.08	1.02	*2.21
Lambda	-9.89	**4.35				
Chi-square model fit	***193.62		***71.74		***106.47	
Nagelkerke pseudo R square	0.29		0.42		0.39	

Notes: Variables are defined in Table 1. Industry variables are not reported. ***, ** and *represent significance levels of 0.01, 0.05, and 0.10, respectively.

Heckman Adjusted Model: *Going concern opinion = f (β_0 + β1Female director + β_2Experienced directors + β_3Proportion of independent directors + β_4Dual CEO/board chair + β_5Board engagement + β_6Big 4 auditor + β_7Audit committee + β_8Block shareholding + β_9Age + β_{10}Net interest cover + β_{11}Size + β_{12}Leverage + β_{13}Z score + β_{14}CEO change + β_{15}Lambda + Industry dummies + e)*

Propensity Score Model: *Going concern opinion = f (β_0 + β_1Female director + β_2Experienced directors + β_3Proportion of independent directors + β_4Dual CEO/board chair + β_5Board engagement + β_6Big 4 auditor + β_7Audit committee + β_8Block shareholding + β_9Age + β_{10}Net interest cover + β_{11}Size + β_{12}Leverage + β_{13}Z score+ β_{14}CEO change + e)*

Going Concern Opinion in 2007 and 2008 Model: *Going concern opinion = f (β_0 + β_1Female director + β_2Experienced directors + β_3Proportion of independent directors + β_4Dual CEO/board chair + β_5Board engagement + β_6Big 4 auditor + β_7Audit committee + β_8Block shareholding + β_9Age + β_{10}Net interest cover + β_{11}Size + β_{12}Leverage + β_{13}Z score+ β_{14}CEO change + Industry dummies + e)*