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The Diversity of Expertise on Corporate Boards in Australia

Abstract:

Corporate boards are expected to comprise directors possessing an appropriate range of expertise. Yet, little is actually known about the expertise that exists on boards. In this study, we examine the diversity of professional expertise on corporate boards in Australia and implications for shareholder value. We categorize directors by 11 types of professional expertise and find the most common types of expertise are business executives, accountants, bankers, scientists, lawyers and engineers. We find that expertise diversity on boards is primarily related to board size, industry and location. Our analysis also suggests that shareholders benefit when firms diversify their board expertise within a subset of specialist business expertise (lawyers, accountants, consultants, bankers and outside CEOs). Further diversity beyond this subset of expertise is associated with lower firm performance and value.

Keywords: board diversity, board of directors, director appointments, professional expertise.

JEL codes: G30, G34, J44.

1. Introduction

Board of director composition is an issue that has challenged academics and practitioners for decades (Fama and Jensen, 1983). Yet, while guidance has been provided to corporate boards on other aspects of board composition, such as director independence and gender diversity, little direction has been provided on the types of expertise that are expected to be present on boards of directors.¹ If guidance is provided, it simply states that boards are expected to “*comprise directors possessing an appropriate range of skills and expertise*” (ASX, 2010, pg. 19). Since little is known about the types of expertise that exist on corporate boards and what an *appropriate* range of expertise may be, this is the focus of this paper.

Prior studies of director expertise have generally focused on the existence of a particular type of expertise. In Australia, studies have examined the accounting expertise and political experience of directors (Aldamen et al., 2012; Christensen et al., 2010; Gray et al., 2014). International studies have also investigated the existence of legal and banking expertise and experience as an outside CEO (Agrawal and Knoeber, 2001; Fich, 2005; Guner et al., 2008). To date, Anderson et al. (2011) is the only study that examines multiple types of expertise in the same setting. Their measures of professional heterogeneity include the existence of lawyers, consultants, accountants, bankers and outside CEOs on the board. However, since firms operate in a wide range of different industries (mining, pharmaceutical, electronics, banking, energy, utilities, and so on) there are likely to be a range of different types of expertise on their boards, which have not yet been investigated.

In this study, we categorize corporate directors in Australia into 11 professional expertise groups – academics, accountants, bankers, consultants, doctors,

¹ One exception is the requirement of at least one financial expert on audit committees in the United States and other jurisdictions.

engineers, executives, lawyers, other CEOs, politicians and scientists. This allows us to comprehensively analyse the diversity of expertise on corporate boards. Using these 11 types of professional expertise, we examine the determinants of the diversity of expertise on corporate boards. We expect the diversity of expertise on boards to be related to board size and other firm characteristics (firm size, operating performance, growth, leverage, board composition and CEO power), the location of the firm (and hence the supply of local directors), and to exhibit some clustering of certain types of professional expertise in specific industries (Anderson et al., 2011; Knyazeva et al., 2013).

In addition, to determine whether professional expertise diversity is in the best interests of shareholders, we use cross-sectional analysis and an event study of new director appointments to relate expertise diversity to firm value. There are arguments both for and against increased board diversity. Prior studies argue that boards comprising directors from different business and socioeconomic backgrounds bring different perspectives to their monitoring and advising duties that can provide benefits to shareholders through improved resource utilization, problem solving and strategy formulation (Jensen, 1993; Klein, 1998; Williams and O'Reilly, 1998). However, other studies argue that directors from different backgrounds can create conflicts in the boardroom and slow down decision making (Baranchuk and Dybvig, 2009; Putnam, 2007). Which of these perspectives is more relevant to expertise diversity is unknown.

Our analysis indicates that the most common types of professional expertise on corporate boards in Australia are business executives, accountants, bankers, scientists, lawyers and engineers. We find that some types of professional expertise are clustered in certain industries – bankers (financial), scientists (materials, energy

and health care), engineers (materials, energy and industrials) and academics and doctors (health care) – whereas other types of expertise are prevalent across all industries (accountants, bankers, executives and lawyers). Overall, the primary determinants of expertise diversity on the board are board size, industry and location.

In both our cross-sectional and event study analysis, we find no overall relationship between expertise diversity and firm value. However, we find evidence that shareholders benefit when firms limit their board diversity to a subset of specialist business expertise. That is, shareholders react positively when directors bring new legal, accounting, consulting, banking and outside CEO expertise to the board. Further diversity beyond this subset of expertise is associated with lower firm performance and value.

This research extends the existing literature in a number of ways. In Australia, prior studies have examined the independence, gender, financial expertise, political connections, experience and interlocking directorships of corporate directors (Adams et al., 2011; Aldamen et al., 2012; Balatbat et al., 2004; Chapple and Humphrey, 2014; Christensen et al., 2010; Cotter and Silvester, 2003; Gray and Nowland, 2013; Gray et al., 2014; Kiel and Nicholson, 2006; Wang and Oliver, 2009). This study adds to this literature by being the first to take a comprehensive look at the diversity of expertise that exists on corporate boards in Australia and the relationship between expertise diversity and firm value. From an international perspective, we extend the work of Anderson et al. (2011) by being the first to categorize all directors on the board, rather than a subset of directors, by their type of professional expertise. We find that the relationship between expertise diversity and firm value depends on the types of expertise included in the diversity measure.

For practitioners, this study provides useful information about the diversity of expertise that exists on corporate boards in Australia. Recent changes to the Australian Stock Exchange (ASX) Corporate Governance Principles and Recommendations require companies to spend more time and effort examining the skills and expertise present on their boards to help identify any gaps in the collective skills of the board.² This study provides boards with vital information to help with this task.

2. Literature review

Prior studies of board diversity show that there are both potential benefits and costs of heterogeneous boards. Klein (1998) proposes that directors from different business and socioeconomic backgrounds provide managers with a broader knowledge base relative to directors from more homogeneous backgrounds. Jensen (1993) argues that heterogeneous boards bring different perspectives to their monitoring and advising duties that can provide benefits to shareholders through improved resource utilization, problem solving and strategy formulation. Williams and O'Reilly (1998) add that greater diversity brings greater resources to problem solving and increases the competitiveness of organizations. In addition, Kandel and Lazear (1992) suggest that greater diversity increases mutual monitoring, which results in less free-riding behaviour.

However, it is also possible that differences in opinion due to the presence of directors with different backgrounds and expertise can create conflicts in the boardroom and slow down decision making (Baranchuk and Dybvig, 2009). Putnam

² The Third version of the ASX Corporate Governance Principles and Recommendations was released in March 2014 and is effective for financial years starting from 1 July 2014. Recommendation 2.2 covers the skills and expertise of the board. This guidance was changed from commentary to a specific recommendation in this version.

(2007) argues that greater diversity decreases cooperation, impedes communication and leads to social loafing. Other studies also show that diversity increases the costs of communication and results in higher team member turnover (Lang, 1986; Arrow, 1998). Therefore, it is unclear whether more or less diversity on the board is in the best interests of shareholders.

Board diversity can be measured from a number of different perspectives – gender, ethnicity, age, experience, education and professional expertise.³ In recent work, Carter et al. (2003) find positive relationships between gender and ethnic diversity and firm value. Campbell and Minguez-Vera (2008) and Adams and Ferreira (2009) also find that gender diversity has a positive effect on firm value and board effectiveness. However, Farrell and Hersch (2005) and Chapple and Humphrey (2014) find that gender diversity is not significantly related to stock market performance. Ali et al. (2013) find that age and gender diversity exhibit non-linear relationships with firm performance. To date, Anderson et al. (2011) provides the most comprehensive analysis of board diversity by examining both the social heterogeneity (age, gender and ethnicity) and occupational heterogeneity (education, expertise and experience) of boards of directors. They find that greater board heterogeneity, including overall heterogeneity and both social and occupational heterogeneity, is associated with higher firm performance.

With respect to the professional expertise of directors, prior studies have generally focused on the existence of a specific type of professional expertise. Studies in Australia and overseas have investigated the role of accounting expertise on audit committees (Aldamen et al., 2012; Christensen et al., 2010; DeFond et al., 2005).

³ This is not a complete list of measures of diversity. Recent studies also examine variation in the industry experience (e.g. Das et al., 2011; Faleye et al., 2012; Knyazeva et al., 2012; Masulis et al., 2012b; von Meyerinck et al., 2012; Wang et al., 2013) and the nationality of directors (Masulis et al., 2012a).

Agrawal and Knoeber (2001) examine directors with backgrounds in law and politics and find that they are more prevalent on the boards of firms for which politics matters more. Guner et al. (2008) examine the role played by directors with banking expertise and show that firms that hire bankers to their boards subsequently increase their use of debt capital. Similarly, Fich (2005) examines directors with CEO experience and shows that appointment announcement returns are higher for directors with expertise as a CEO of another listed company.

Thus far, Anderson et al. (2011) is the only study that examines multiple types of professional expertise in the same setting. Their measures of professional heterogeneity include the existence of lawyers, consultants, accountants, bankers and outside CEOs on the board. We extend their work by categorizing directors into 11 professional expertise groups – academics, accountants, bankers, consultants, doctors, engineers, executives, lawyers, other CEOs, politicians and scientists. While most of these professional expertise groups have been the subject of prior work, we are the first to specifically document the existence of directors with expertise as scientists, engineers and medical doctors, and we are the first to examine such a large number of types of expertise in the same setting. In essence, this is the first study to categorize all directors on the board, rather than a subset of directors, by their type of professional expertise, which substantially reduces the possibility of omitted variable bias.

In this study, we examine the prevalence of different types of professional expertise on corporate boards, the determinants of expertise diversity on corporate boards, and the relationship between expertise diversity and firm value. We expect the diversity of expertise on corporate boards to be determined by a number of factors – firm, board, industry and location. In particular, we expect a positive relationship

between board size and diversity, as the greater the number of positions on the board, the more likely the board will have space to appoint directors with different types of expertise. We also expect strong industry effects for certain types of expertise. For example, while scientists, engineers and doctors may exist on the boards of all firms, they are most likely to be concentrated in specific industries where their expertise is most relevant, e.g. mining, energy and health care industries. Since Knyazeva et al. (2013) show that the supply of directors is heavily dependent on location, we also expect the types of professional expertise on boards to be related to the location of the company. Following Anderson et al. (2011) we also examine relationships between diversity and firm size, operating performance, growth, leverage, board composition (independence, gender and outside directorships) and CEO power (duality).

To determine whether shareholders benefit from higher or lower professional expertise diversity on the board, we relate expertise diversity to firm value in two settings – cross-sectional analysis and an event study of new director appointments. Shareholders can benefit from professional expertise diversity if directors from different professional backgrounds bring a broader base of knowledge, a greater range of perspectives and a larger collection of problem solving abilities to their monitoring and advising duties (Jensen, 1993; Klein, 1998; Williams and O'Reilly, 1998). However, it is also possible that directors from different professional backgrounds find it harder to communicate effectively with each other, resulting in reduced cooperation, greater conflict and slower decision making (Baranchuk and Dybvig, 2009; Putnam, 2007). If the net benefits of professional expertise diversity on the board outweigh the costs, we expect a positive relationship between expertise diversity and firm value.

3. Professional expertise on corporate boards

To examine the types of professional expertise on corporate boards, we use a sample of ASX-listed companies. In Australia, section 300 of the Corporations Act 2001 and ASX listing requirements mandate companies to disclose the skills, qualifications, experience and expertise relevant to the position of director held by each director in office. This information from director biographies in annual reports, along with supplementary internet searches, allows us to classify each director by their type of professional expertise. Our sample initially comprises all directors and firms available from the Boardroom database from Connect4 in 2007.⁴ After removing repeat director observations, alternate directors and a small number of companies where we could not find information on the professional expertise of all board members, our sample includes 8,791 directorships in 1,548 ASX-listed companies.⁵

All variable definitions are provided in the Appendix. Directors with experience as a CPA/CA or CFO are classified as *Accountants*. *Bankers* are identified by their experience in the banking or finance industries. *Lawyers* have experience as a practicing lawyer. *Scientists* and *Engineers* are identified as having stated experience in science and engineering, respectively. *Consultants* are management, marketing, IT or industry-specific consultants (not accounting, finance or legal consultants). *Politicians* have prior experience in political office. *Other CEOs* are directors who are current CEOs of other listed companies. *Academics* hold a university appointment. *Doctors* have experience as a practicing medical doctor. *Executives* are all other directors (who have general business experience) that have not been categorized into the above expertise groups. Where directors have professional expertise in more than

⁴ There is no specific reason for selecting the year 2007, except that it was the last year available before any potential effects of the financial crisis when we started hand-collecting the professional expertise data.

⁵ We remove only 13 firms from our analysis because we cannot find professional expertise information on one or more directors on their boards.

one area, they are classified by their primary expertise. Examples of these expertise classifications are provided in Table 1.⁶

Table 2 provides details of the directorships held by directors with each type of professional expertise. Out of a total of 8,791 directorships, 4,077 are held by executives, 1,465 by accountants, 1,102 by bankers, 695 by scientists, 620 by lawyers, 375 by engineers, 161 by consultants, 85 by both politicians and other CEOs, 65 by academics and 61 by doctors. The table also shows that a total of 403 directorships are held by female directors and 3,378 directorships are held by independent directors.

Table 3 shows the percentage of all firms and firms by industry (10 GICS industry sectors) with each type of professional expertise on their board. The statistics for all firms show that 85.92% of firms have at least one executive on their board, 64.01% have an accountant, 39.41% have a banker, 33.98% have a lawyer, 29.78% have a scientist, 18.67% have an engineer, 9.69% have a consultant, 5.36% have a politician, 5.04% have other CEOs, 4.20% have an academic and 3.36% have a doctor. The table also shows that there is obvious clustering of some types of expertise in certain industries. Bankers are most prevalent in firms in the Financial sector. Scientists are most prevalent in firms in the Materials, Energy and Health Care industries. Engineers are most prevalent in firms in the Materials, Energy and Industrials industries. Academics and doctors are most prevalent in firms in the Health Care industry.

Table 4 displays average board characteristics for all firms and across industries. Significance is shown for industry statistics that are higher (+) or lower (-) than all other industries. The average board has 5.68 directors, independence of 36.64% and 4.05% female representation. The average incidence of Chairman-CEO

⁶ Professional expertise classifications were undertaken by two research assistants with the authors making a final decision on any classifications that were not consistent between the two research assistants.

duality is 8.40%. The average board is comprised of 44.70% of executives, 17.04% of accountants, 12.10% of bankers, 9.42% of scientists, 7.23% of lawyers, 4.51% of engineers, 1.88% of consultants, 0.91% of politicians, 0.83% of other CEOs, 0.71% of doctors and 0.66% of academics. Overall, the average board has 2.99 types of expertise (expertise index of 0.53), but this varies across industries.⁷ There are significantly more types of expertise on the boards of firms in the Energy (3.25), Materials (3.25) and Health Care (3.18) industries, due to the clustering of scientists, engineers, doctors and academics in these industries.

Figure 1 highlights these differences in professional expertise across industries for boards of 10 directors. In the Energy and Materials industries, boards have approximately 3 executives, 2 scientists, 2 accountants, 1 engineer, 1 lawyer and 1 banker. In the Financial sector, boards have approximately 4 bankers, 3 executives, 2 accountants and 1 lawyer. In the Health Care industry, boards have approximately, 5 executives, 1 accountant, 1 banker, 1 scientist, 1 doctor and 1 lawyer. In all other industries, boards generally have 6 executives, 2 accountants, 1 banker and 1 lawyer.

Figure 2 also shows that the number of types of expertise on the board is positively related to board size. When there are three directors on the board the average number of types of expertise is 2.27. When board size is seven, there is an average of 3.26 types of expertise on the board. When board size is eleven, there is an average of 3.76 types of expertise on the board. For the largest board of seventeen directors, there are 7.00 different types of professional expertise on the board.

In summary, this initial analysis highlights three aspects of the professional expertise of directors on corporate boards. First, industry is an important determinant of the type of expertise present on corporate boards. For example, we find that certain

⁷ The breakdown of firms by the number of types of expertise is: 1 type of expertise = 5.4% of firms, 2 = 26.9%, 3 = 39.3%, 4 = 20.8%, 5 = 6.7%, 6 = 0.9% and 7 = 0.06%.

types of expertise are clustered in particular industries - bankers (Financial), scientists (Materials, Energy and Health Care), engineers (Materials, Energy and Industrials) and academics and doctors (Health Care). Second, the number of types of expertise on boards is positively related to board size, which suggests that boards are more likely to diversify their professional expertise when they have more board seats to fill. Third, while certain types of expertise are prevalent across all industries (executives, accountants, bankers and lawyers), we also find that less common types of expertise are also found in most industries. For example, some firms in the Financial sector have scientists, engineers, academics and doctors on their board. This indicates that some firms are diversifying the professional expertise on their boards.

4. Expertise diversity and firm value

In this section, we examine the determinants of professional expertise diversity and relate the diversity of expertise on the board to firm value. The cross-sectional sample used in this section includes 1,196 ASX-listed firms in 2007 that have director data available from the Boardroom database from Connect4 and firm financial data available from the Aspect database. Firm financial data includes total assets, return on assets, leverage and Tobin's Q in 2007 and asset growth from 2006 to 2007. The financial variables (excluding total assets) are winsorized at the 1st and 99th percentiles.

Table 5 provides descriptive statistics of this cross-sectional sample. Panel A shows that the mean (median) firm has total assets of \$2.66 billion (\$36 million), Tobin's Q of 2.83 (1.94), return on assets of -9.59% (0.39%), asset growth of 57.13% (21.42%) and debt-to-total assets of 0.33 (0.29). Average board size is 5.74, with board independence of 38.18%, female representation of 4.01% and 38.97% of

directors with other directorships in listed companies. The incidence of Chairman-CEO duality is 9.28%. The average number of types of expertise on the board is 3.02, average expertise index is 0.54 and average industry-adjusted number of expertise is 1.01. In general, these statistics are similar to those of the previous section.

Panel B displays information on the location of the primary registered office of the firms in the cross-sectional sample. This information is acquired from the corporate directory section of firm annual reports. Most firms are located in the states of Western Australia (375), New South Wales (355), Victoria (246), Queensland (114) and South Australia (44). Due to the small number of observations from the Australian Capital Territory (5), Tasmania (5) and the Northern Territory (1), we treat these as a combined group in our analysis. There are also 51 firms with their primary registered offices outside of Australia, which we denote as Foreign. Mean *t*-tests show that the average number of types of expertise is significantly higher for firms located in Western Australia and outside of Australia, and significantly lower for firms located in Victoria. These differences between locations likely reflect differences in both the industry composition of firms and the supply of local director expertise.

The prior section indicates that the number and types of professional expertise on corporate boards differ across industries and by board size. In this section we examine these and other determinants of the expertise on corporate boards. We expect expertise diversity to be related to board size and other firm characteristics (firm size, operating performance, growth, leverage, board composition and CEO power), the location of the firm (and hence the supply of local directors), and to differ across industries (Anderson et al., 2011; Knyazeva et al., 2013).⁸

⁸ Kaczmarek et al. (2012) also examine the relationship between nomination committees and board diversity. We do not specifically examine nomination committee characteristics in this paper because only 305/1,196 (=26%) of firms in our sample have a nomination committee. This means that in at least 74% of firms the nominating function is undertaken by the whole board.

Table 6 provides the results of our analysis of expertise diversity. To ensure the robustness of our analysis, we utilize a number of different measures of expertise diversity, including the number of different types of expertise, expertise index and industry-adjusted number of expertise. We use Poisson count models when the dependent variable is the number of types of expertise and ordinary least squares (OLS) models for continuous dependent variables. All models include robust standard errors.

We find that both the number of types of professional expertise and the expertise index are positively related to board size, higher for firms in the Energy, Financial, Health Care and Materials industries, and lower for firms located in the states of New South Wales and Victoria. The number of types of expertise is also positively related to board independence, while the expertise index is positively related to firm growth. The results for the industry-adjusted number of expertise are similar, except the significance of the industry results are diminished due to the industry adjustment.

To compare our results to those of Anderson et al. (2011) we separate our types of professional expertise into two subsets. The first subset includes the five types of specialist business expertise (lawyers, consultants, accountants, bankers and other CEOs) covered by Anderson et al. (2011). The second subset includes the additional six types of expertise we introduce in this paper.⁹ The general business expertise of executives and the specific expertise of scientists, engineers, politicians, academics and medical doctors. We find diversity within the first subset of specialist business expertise (lawyers, consultants, accountants, bankers and other CEOs) is positively related to return on assets, leverage and board size, is higher in the

⁹ The results are consistent if we exclude the general business expertise category from this second subset. It is included to ensure we include the expertise of all the directors on the board in our analysis.

Financial sector and lower in the Industrials sector and in the states of Victoria and Queensland. These results are consistent with Anderson et al. (2011) who find that their measures of diversity are positively related to firm performance, complexity (including leverage) and board size. However, we find that diversity within the second subset is negatively related to return on assets and director experience (percentage of directors with other directorships in listed companies). It is positively related to board size and independence and is higher in the Energy, Health Care, Industrials, Materials and Utilities industries and lower in the Financial industry and in the states of New South Wales and Victoria. Thus, this analysis suggests that results can differ depending on the types of expertise included (or excluded) in the measure of expertise diversity.

Table 7 examines the relationship between the diversity of expertise on the board and firm value. Consistent with prior studies, our measure of firm value is Tobin's Q and control variables include the natural logarithm of total assets, return on assets, growth, debt to total assets, board size, board independence, board gender diversity, director experience, Chairman-CEO duality and industry identifiers. All models include robust standard errors. In the first specification we use OLS to relate the number of types of expertise to firm value and find an insignificant relationship. In the second specification, we use a two-stage approach (2SLS) to control for potential endogeneity between firm value and professional expertise. The first stage is the first specification in Table 6 and effectively uses the location variables as instrumental variables.¹⁰ In the second stage we use the predicted values from the first stage for the number of types of professional expertise. Using this 2SLS approach, we find that the number of types of expertise is insignificantly related to firm value.

¹⁰ We believe location is a good instrument as we show that location is significantly related to the diversity of professional expertise in both Tables 5 and 6. Location has also been used as a valid instrument in prior studies (Anderson et al., 2011; Knyazeva et al., 2013).

In the third and fourth specifications, we repeat our analysis using the expertise index and industry-adjusted number of expertise as the measures of expertise diversity and continue to find insignificant relationships with firm value. In the fifth specification, we follow Ali et al. (2013) and estimate a non-linear relationship between the number of types of expertise and firm value and again find insignificant results. In the sixth specification we split the number of types of expertise into two subsets, with the first subset consistent with the types of specialist business expertise covered by Anderson et al. (2011). We find that both subsets of expertise diversity are insignificantly related to firm value.

We also repeat our analysis using return on assets as an alternative measure of firm performance.¹¹ In unreported results, we find insignificant relationships between expertise diversity and return on assets in the first five specifications in Table 7. For the final specification, including the two subsets of expertise diversity, we find a negative relationship between the number of other types of expertise (executives, scientists, engineers, politicians, academics and doctors) and return on assets, which is reported in specification seven. This result suggests that firms perform worse when their professional expertise diversity is extended beyond the specialist business expertise of lawyers, consultants, accountants, bankers and other CEOs.

The results of the control variables are consistent with prior studies and indicate that firm value is positively related to growth, board independence and director experience, and negatively related to firm size, return on assets, leverage and the financial sector. Return on assets is positively related to firm size and growth, negatively related to leverage and board size, and varies across industries.

¹¹ We also repeat our analysis using Tobin's Q and return on assets in 2008 instead of 2007, with consistent results.

In summary, this analysis indicates that there is substantial variation in the diversity of expertise across firms, with the primary determinants of expertise diversity being board size, industry and location. Overall, we find no cross-sectional relationship between expertise diversity on the board and firm value. However, we find some evidence that firm performance, in the form of return on assets, is lower if firms diversify their board expertise beyond the specialist business expertise of lawyers, consultants, accountants, bankers and other CEOs.

5. Director appointments

In this section, we analyse new director appointments as another setting to examine the relationship between professional expertise diversity and firm value. If firms, on average, have the optimal mix of expertise on their boards, then the cross-sectional analysis in the previous section would not be expected to produce significant results. Hence, we now focus on individual director appointments, which allow us to investigate how a change in the number and types of expertise on the board is related to firm value.

We access new non-executive director appointments recorded on the Boardroom database from Connect4 from January 1, 2004 to December 31, 2007. We then remove appointments where announcement dates cannot be confirmed on the ASX Announcement database, where there are multiple movements (appointments or departures) on the same day, where other news is released around the announcement date (-1,+1), where stock price data is not available from the Sirca database and where financial data is not available from the Aspect database. This leaves our appointment sample with 584 observations, all of which are interim appointments (not appointments at annual meetings).

Consistent with prior sections, we analyze appointment announcements and director biographies in annual reports to classify each new appointee and the existing directors on the hiring board by their type of professional expertise. Other director and hiring board characteristics are collected from the Boardroom database, company annual reports and appointment announcements. For all observations, hiring board data is adjusted from year-end to the specific date of the appointment to ensure that we have data on the hiring board that was in place when the new appointment announcement was released to the market.

The market reaction to new director appointments is measured by cumulative abnormal returns (CARs) around the appointment announcement following the standard event study methodology of Dodd and Warner (1983). Market model parameters are estimated from 250 trading days to 20 trading days prior to the announcement date. We also calculate CARs based on average returns over the estimation period and excess returns over the three-day period. The results presented are consistent across these three measures. In unreported analysis, we find the mean and median three-day CARs (-1,+1) are 0.34% and 0.15%. The mean firm has total assets of \$2.86 billion, board size of 4.57 directors and the average number of types of expertise on the board is 2.71. These statistics for the appointing firms are similar to those of the previous sections.

Table 8 identifies the appointments that bring new expertise to the hiring board. A total of 269 appointments bring new expertise, whereas 315 appointments reinforce existing expertise on the hiring board. The most common types of new expertise to hiring boards are bankers (58), accountants (49), engineers (35) and lawyers (27). The most common types of appointments that reinforce existing expertise are executives (178), bankers (46), accountants (34) and scientists (24).

In Table 9, we relate the market reaction to new director appointments to a dummy variable (*New Expertise*), which highlights the addition of a new type of professional expertise to the hiring board. Based on prior studies, we also control for other characteristics of the appointee - gender, independence, number of other directorships in listed companies and interlocking directorships; characteristics of the hiring firm - firm size, return on assets, market-to-book, thin trading, CEO tenure and hiring board independence; and industry and year effects (Adams and Ferreira, 2009; Adams et al., 2011; DeFond et al., 2005; Ferris et al., 2003; Fich, 2005; Fich and Shivdasani, 2006; Gray and Nowland, 2013; Rosenstein and Wyatt, 1990; Shivdasani and Yermack, 1999). To control for other diversity the appointee may bring to the hiring board, we also include dummy variables to indicate when the appointee brings a new gender and new degree to the hiring board. In addition, since the market reaction is expected to differ between different types of professional expertise, we also include dummy variables to isolate the average effect for each type of professional expertise. All models include robust standard errors.

In the first and second specifications, the coefficient on *New Expertise* is insignificant, which indicates that, on average, the addition of a new type of professional expertise to the board is unrelated to firm value. This is consistent with our cross-sectional results in the previous section. The results for the control variables indicate that the market reaction to the appointment of new directors is higher when the appointee is female and has other directorships in listed companies, and for firms that are thinly traded. The market reaction is lower when the appointee has professional expertise as a doctor. These results are consistent with prior studies (Adams et al., 2011; Gray and Nowland, 2013).

In the third specification, we distinguish between the five types of specialist business expertise covered by Anderson et al. (2011) and the additional six types of professional expertise we introduce in this paper. The coefficient on *New Expertise* * (*Lawyers, Consultants, Accountants, Bankers, Other CEOs*) indicates that the market reaction to directors who bring these new types of specialist business expertise to the board is significantly higher than other types of new expertise. In addition, the negative coefficient on *New Expertise* indicates that the average market reaction to the appointment of directors with other types of new expertise is negative.

In summary, our analysis of new director appointments indicates that, on average, we find an insignificant market reaction to the addition of new professional expertise to the hiring board. This is consistent with our prior analysis and indicates that there is no overall relationship between professional expertise diversity and firm value. However, we find evidence that shareholders benefit when firms limit their board diversity to a subset of specialist business expertise (lawyers, accountants, consultants, bankers and other CEOs). Further diversity beyond this subset of expertise is associated with lower firm value.

Our interpretation of these results is that all types of expertise are not equally important to boards. On average, the expertise provided by lawyers, accountants, consultants, bankers and other CEOs, is valued more by shareholders than other types of expertise. This is likely because these types of specialist business expertise are more relevant to the monitoring and advising functions performed by corporate directors across all firms. While we do not test for these particular outcomes in this paper, prior studies document that accounting and legal expertise is associated with higher accounting quality, banking expertise helps firms source additional funding and outside CEOs (and potentially consultants also) are valuable sources of

managerial talent and expertise (DeFond et al., 2005; Fich, 2005; Guner et al., 2008). Thus, our results indicate that, in general, boards need to be wary of diversifying their expertise beyond these types of specialist business expertise, as diversification into other types of expertise is associated with a lower share market reaction and lower return on assets.

6. Further analysis

So far, our analysis has been conducted on all sample firms. However, it is possible that our results may differ in different subsamples. For example, having scientists and engineers on the boards of firms in certain industries (e.g. energy and materials) may be more beneficial than in other industries (e.g. financial). Thus, we repeat our analysis relating expertise diversity to firm value using different industry subsamples – financial, energy and materials, health care, and all other industries as a group. We find that the negative relationship between return on assets and the number of other types of expertise is significant for firms in the other industries group (consumer staples, consumer discretionary, industrials, information technology, telecommunication services and utilities). The positive share market reaction to the appointment of directors with specialist business expertise (lawyers, accountants, consultants, bankers and other CEOs) is significant in firms in the energy and materials industries. Unfortunately, all other results are insignificant, likely due to the smaller number of observations.

We also undertake a number of robustness checks. Since it is possible for directors to hold a directorship for less than a full year, we examine the effect of partial-year directorships on our analysis. We hand collect the attendance records of directors from annual reports in 2007. This reduces our initial sample to a total of

7,549 directorships (out of 8,791 directorships) in 1,404 firms (out of 1,548 firms). We find that 1,653 out of 7,549 (21.8%) directorships are partial-year directorships and this affects 695 out of 1,404 (49.5%) firms. When we weight directorships by the proportion of board meetings directors are eligible to attend during the year, we find that board size in this sample is reduced from a mean of 5.38 to 4.79 directors.¹² The mean number of types of expertise is reduced from 2.91 to 2.76. However, these changes have no material effect on our reported results.

Most prior studies of directors only examine the role played by outside (non-executive) directors. This is particularly the case for U.S. studies as the boards of directors of U.S. companies are predominantly comprised of outside directors. However, in Australia inside (executive) directors are still prevalent on corporate boards. Table 2 shows that 2,675 out of 8,791 (30.4%) directorships are held by executive directors. Therefore, in our analysis of the professional expertise on corporate boards we have included the expertise of both outside and inside directors to obtain an understanding of all of the expertise present on the board.

In our analysis of the market reaction to director appointments (Table 9) we have presented the results for a subset of the control variables that we have used in wider testing. Additional control variables include appointee qualification dummy variables (bachelor degree, law degree, MBA degree, other master degree and PhD degree), a dummy variable indicating CEO involvement in the appointment process, a dummy variable indicating CEO-Chairman duality and variables controlling for the professional expertise diversity, qualification diversity and gender diversity of the hiring board. Since the coefficients on these variables are all insignificant and do not affect the reported results, they are not included in our main analysis.

¹² For example, if a director is appointed during the year and is eligible to attend 5 out of 10 board meetings then the directorship is weighted at $5/10 = 0.50$. If a director resigns during the year and is eligible to attend 4 out of 7 board meetings then the directorship is weighted at $4/7 = 0.57$.

7. Conclusion

In order to perform their monitoring and advising functions, boards of directors are expected to comprise directors possessing an appropriate range of expertise. Yet, little is known about the expertise that exists on corporate boards and what an appropriate range of expertise may be. In this study, we examine the diversity of professional expertise on corporate boards in Australia and implications for shareholder value using a hand-collected dataset of directors categorized by 11 types of expertise.

We find the most common types of professional expertise on corporate boards in Australia are business executives, accountants, bankers, scientists, lawyers and engineers. Expertise diversity is greater in firms with bigger boards and is dependent on firm location and industry. Our results indicate that shareholders benefit when firms limit their expertise diversity on the board to directors with legal, accounting, consulting, banking and outside CEO expertise. If these types of expertise do not exist on the board, our analysis suggests that adding them to the board will benefit shareholders. However, further diversity beyond this subset of expertise is associated with lower firm performance and value.

This paper contributes to both the academic literature and practice. From an academic perspective, we are the first to examine all types of professional expertise on the board, rather than a subset of directors, thus broadening our understanding of the heterogeneity of directors on corporate boards. From a practical perspective, this study provides vital information to boards to help in the process of identifying any gaps that may exist in the skills and expertise on corporate boards. Finally, we acknowledge that there are many different ways to categorize and investigate the skills and expertise of corporate directors. Thus, we look forward to future studies

examining these issues from different perspectives and the types of expertise in more depth.

References

- Adams, R., and D. Ferreira, 2009, Women in the boardroom and their impact on governance and performance, *Journal of Financial Economics* 94, 291-309.
- Adams, R., S. Gray and J. Nowland, 2011, Does gender matter in the boardroom? Evidence from the market reaction to mandatory new director announcements, SSRN working paper.
- Ali, M., Y.L. Ng and C. Kulik, 2013, Board age and gender diversity: A test of competing linear and curvilinear predictions, *Journal of Business Ethics*, forthcoming.
- Aldamen, H., K. Duncan, S. Kelly, R. McNamara, and S. Nagel, 2012, Audit committee characteristics and firm performance during the global financial crisis, *Accounting and Finance*, 52, 971-1000.
- Anderson, R., D. Reeb, A. Upadhyay and W. Zhao, 2011, The economics of director heterogeneity, *Financial Management* 40, 5-38.
- Agrawal, A. and C. Knoeber, 2001, Do some outside directors play a political role? *Journal of Law and Economics* 44, 179-98.
- Arrow, K., 1998, What has economics to say about racial discrimination? *Journal of Economic Perspectives* 12, 91-100.
- ASX Corporate Governance Council, 2010, *Corporate Governance Principles and Recommendations with 2010 Amendments* (ASX, Sydney).
- Balatbat, M., S. Taylor, and T. Walter, 2004, Corporate governance, insider ownership and operating performance of Australian initial public offerings, *Accounting and Finance* 44, 299-328.
- Baranchuk, N. and P. Dybvig, 2009, Consensus in diverse corporate boards, *Review of Financial Studies* 22, 715-747.

- Campbell, K. and A. Minguez-Vera, 2008, Gender diversity in the boardroom and firm financial performance, *Journal of Business Ethics* 83, 435-451.
- Carter, D., B. Simkins and W. Simpson, 2003, Corporate governance, board diversity and firm value, *Financial Review* 38, 33-53.
- Chapple, L. and J. Humphey, 2014, Does board gender diversity have a financial impact? Evidence using stock portfolio performance, *Journal of Business Ethics*, forthcoming.
- Christensen, J., P. Kent, and J. Stewart, 2010, Corporate governance and company performance in Australia, *Australian Accounting Review* 20, 372-386.
- Cotter, J., and M. Silvester, 2003, Board and monitoring committee independence, *Abacus* 39, 211–32.
- Das, N., O. Kini, V. Nanda and B. Onal, 2011, The influence of directors from related industries in shaping firm policies, SSRN working paper.
- DeFond, M., R. Hann and X. Hu, 2005, Does the market value financial expertise on audit committees of boards of directors? *Journal of Accounting Research* 43, 153–193.
- Dodd, P. and J. Warner, 1983, On corporate governance: A study of proxy contests, *Journal of Financial Economics* 11, 401-438.
- Faleye, O., R. Hoitash and U. Hoitash, 2012, Industry expertise on corporate boards, SSRN working paper.
- Fama, E. and M. Jensen, 1983, Separation of ownership and control, *Journal of Law and Economics* 26, 301–325.
- Farrell, K. and P. Hersch, 2005, Additions to corporate boards: The effect of gender, *Journal of Corporate Finance* 11, 85-106.

- Ferris, S., M. Jagannathan and A. Pritchard, 2003, Too busy to mind the business? Monitoring by directors with multiple board appointments, *Journal of Finance* 58, 1087-1111.
- Fich, E., 2005, Are some outside directors better than others? Evidence from director appointments by Fortune 1000 firms, *Journal of Business* 78, 1943–1971.
- Fich, E. and A. Shivdasani, 2006, Are busy boards effective monitors? *Journal of Finance* 61, 689–724.
- Gray, S. and J. Nowland, 2013, Is prior director experience valuable? *Accounting and Finance* 53, 643-666.
- Gray, S., I. Harymawan and J. Nowland, 2014, Political and government connections on corporate boards in Australia: Good for business? *Australian Journal of Management*, forthcoming.
- Guner, A., U. Malmendier and G. Tate, 2008, Financial expertise of directors, *Journal of Financial Economics* 88, 323-354.
- Jensen, M., 1993, The modern industrial revolution, exit and the failure of internal control systems, *Journal of Finance* 48, 831-880.
- Kaczmarek, S., S. Kimino and A. Pye, 2012, Antecedents of board composition: The role of nominating committees, *Corporate Governance: An International Review* 20, 474-489.
- Kandel, E. and E. Lazear, 1992, Peer pressure and partnerships, *Journal of Political Economy* 100, 801-817.
- Kiel, G., and G. Nicholson, 2006, Multiple directorships and corporate performance in Australian listed companies, *Corporate Governance: An International Review* 14, 530-546.

- Klein, A., 1998, Firm performance and board committee structures, *Journal of Law and Economics* 41, 275-303.
- Knyazeva, A., D. Knyazeva and R. Masulis, 2013, The supply of corporate directors and board independence, *Review of Financial Studies* 26, 1561-1605.
- Knyazeva, A., D. Knyazeva and C. Raheja, 2012, Do opposites attract? Dissimilar directors and coordination within corporate boards, SSRN working paper.
- Lang, K., 1986, A language theory of discrimination, *Quarterly Journal of Economics* 101, 363-382.
- Masulis, R., C. Wang, F. Xie, 2012a, Globalizing the boardroom: The effects of foreign directors on corporate governance and performance, *Journal of Accounting and Economics* 53, 527-554.
- Masulis, R., C. Ruzzier, S. Xiao and S. Zhao, 2012b, Do independent directors matter? SSRN working paper.
- Putnam, R., 2007, E pluribus unum: Heterogeneity and community in the twenty-first century – The 2006 Johan Skytte Prize lecture, *Scandinavian Political Studies*, 30, 137-174.
- Rosenstein, S. and J. Wyatt, 1990, Outside directors, board independence and shareholder wealth, *Journal of Financial Economics* 26, 175-191.
- Shivdasani, A., and D. Yermack, 1999, CEO involvement in the selection of new board members: An empirical analysis, *Journal of Finance* 54, 1829-1853.
- von Meyerick, F., D. Oesch and M. Schmid, 2012, The value of director industry experience, SSRN working paper.
- Wang, C., F. Xie and M. Zhu, 2013, Industry expertise of independent directors and board monitoring, SSRN working paper.

Wang, Y., and J. Oliver, 2009, Board composition and firm performance variance: Australian evidence, *Accounting Research Journal* 22, 196-212.

Williams, K. and C. O'Reilly, 1998, Demography and diversity in organizations: A review of 40 years of research, *Research in Organizational Behavior* 20, 77-140.

Appendix – Variable Definitions

Variable	Definition
Academic	Dummy variable equal to one if the director is classified as an academic (current university appointment).
Accountant	Dummy variable equal to one if the director is classified as an accountant (experience as a CPA/CA or CFO).
Banker	Dummy variable equal to one if the director is classified as a banker (experience in banking or finance industries).
Consultant	Dummy variable equal to one if the director is classified as a consultant (management, marketing, IT or industry-specific).
Doctor	Dummy variable equal to one if the director is classified as a medical doctor.
Engineer	Dummy variable equal to one if the director is classified as an engineer (engineering experience).
Executive	Dummy variable equal to one if the director is classified as a general executive/businessperson (not classified into another occupation group).
Lawyer	Dummy variable equal to one if the director is classified as a lawyer (experience as a practicing lawyer).
Other CEO	Dummy variable equal to one if the director currently the CEO of another listed company.
Politician	Dummy variable equal to one if the director is classified as a politician (previously held a political office)
Scientist	Dummy variable equal to one if the director is classified as a scientist (experience as a scientist).
No. Expertise	The number of different types of professional expertise on the board.
Expertise Index	1 - Herfindahl index of squared proportions of each type of professional expertise on the board.
Industry Adjusted No. Expertise	The number of different types of professional expertise on the board divided by the industry average number of expertise.
Consumer Discretionary	Indicates firms in the GICS Consumer Discretionary sector.
Consumer Staples	Indicates firms in the GICS Consumer Staples sector.
Energy	Indicates firms in the GICS Energy sector.
Financial	Indicates firms in the GICS Financial sector.
Health Care	Indicates firms in the GICS Health Care sector.
Industrials	Indicates firms in the GICS Industrials sector.
Information Technology	Indicates firms in the GICS Information Technology sector.
Materials	Indicates firms in the GICS Materials sector.
Telecom Services	Indicates firms in the GICS Telecommunication Services sector.
Utilities	Indicates firms in the GICS Utilities sector.
Total Assets	Total assets in billions of Australian dollars
Ln(Total Assets)	Natural logarithm of total assets.
Tobin's Q	Market value of equity plus book value of debt all divided by total assets.
Return on Assets	Return on assets (winsorized at 1 st and 99 th percentiles).
Growth	One-year growth in total assets (winsorized at 1 st and 99 th percentiles).
Debt to Total Assets	Total debt divided by total assets (winsorized at 1 st and 99 th percentiles).
Market-to-Book	Market-to-book ratio (winsorized at 1 st and 99 th percentiles).

CARs(-1,+1)	Three-day cumulative abnormal returns around the announcement of the new director appointment. Market model parameters are estimated from 250 trading days to 20 trading days prior to the announcement date.
Thin Trading	Dummy variable equal to one if the firm is thinly traded (not traded every day in the -30,+30 period around the appointment announcement)
Board Size	Number of directors on the board.
% Independent	Percentage of independent directors on the board.
% Females	Percentage of female directors on the board.
% Other Directorships	Percentage of directors on the board who hold directorships in other listed companies.
Duality	Dummy variable equal to one if the same person holds the Chairman and CEO positions.
CEO Tenure	Tenure of the CEO in years.
Independent Board	Dummy variable equal to one if the board is majority independent.
WA	Dummy variable equal to one if the primary registered office of the company is located in Western Australia.
NSW	Dummy variable equal to one if the primary registered office of the company is located in New South Wales.
VIC	Dummy variable equal to one if the primary registered office of the company is located in Victoria.
QLD	Dummy variable equal to one if the primary registered office of the company is located in Queensland.
SA	Dummy variable equal to one if the primary registered office of the company is located in South Australia.
ACT/TAS/NT	Dummy variable equal to one if the primary registered office of the company is located in the Australia Capital Territory, Tasmania or Northern Territory.
FOREIGN	Dummy variable equal to one if the primary registered office of the company is located outside of Australia.
Female	Dummy variable equal to one if the director is female.
Independent	Dummy variable equal to one if the director is classified as an independent director.
Other Directorships	Number of directorships in other listed companies.
Interlocking	Dummy variable equal to one if the appointee and a director on the hiring board both hold directorships in a common other company.
New Female	Dummy variable equal to one if the appointee is female and the hiring board does not contain female directors.
New Degree	Dummy variable equal to one if the appointee brings a new qualification to the hiring board. Qualifications are classified into PhD, MBA, other Master degree, law degree, other bachelor degree and no reported degree holders.
New Expertise	Dummy variable equal to one if the appointee brings a new type of professional expertise to the hiring board.

Figure 1
Average Number of Directors with Each Type of Expertise across Industries
(board size = 10)

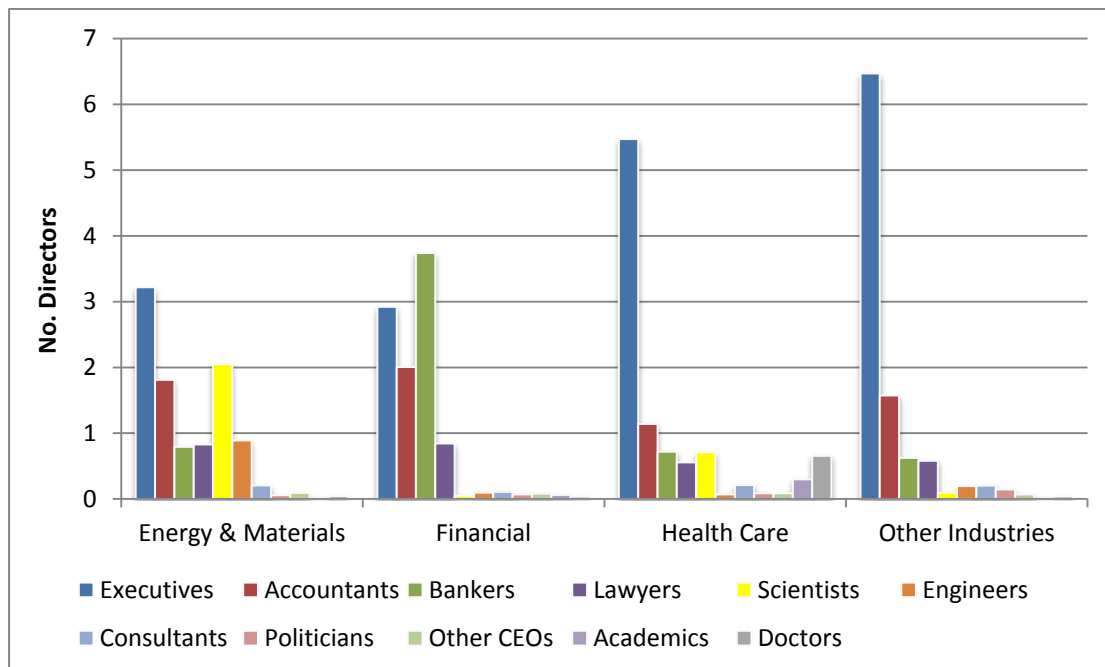


Figure 2
Board Size and Average Number of Types of Expertise

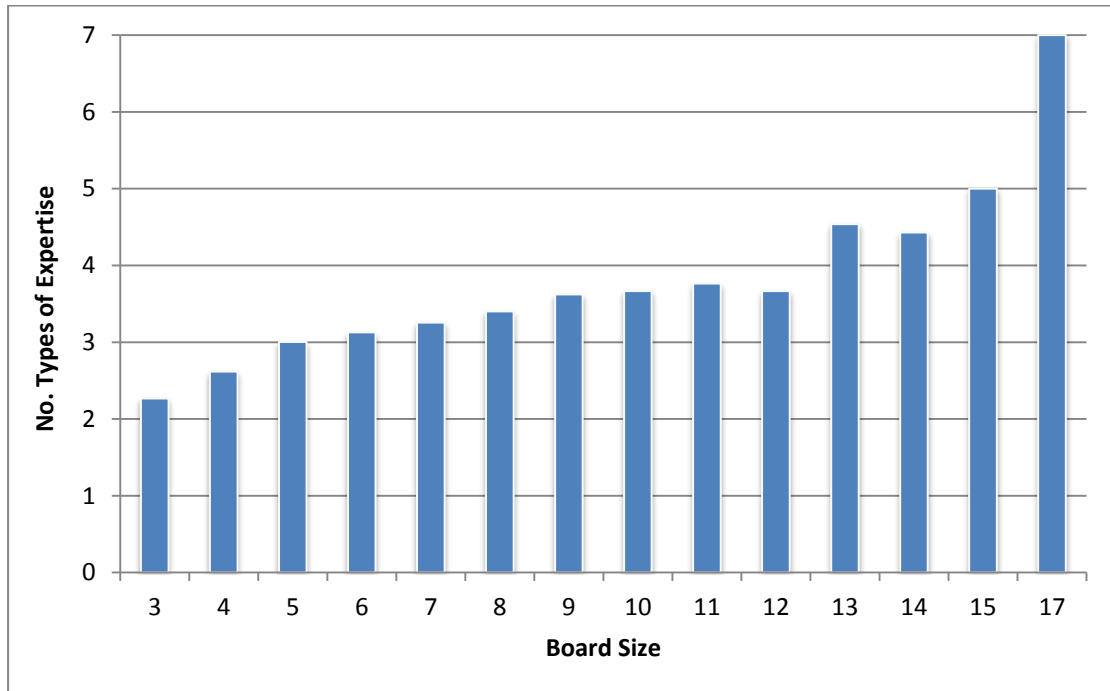


Table 1 – Examples of Professional Expertise

Director	Expertise	Biography
Michael Douglas	<i>Academic</i>	Dr Douglas is Assistant Dean, Professor of Biochemistry and Molecular Biology and Director of the Office of Technology Management at University of Arkansas Medical Sciences, Little Rock, Arkansas.
David Lymburn	<i>Accountant</i>	Mr Lymburn is a Chartered Accountant with over 25 years experience in accounting and corporate management.
Charles Bright	<i>Banker</i>	33 years in investment banking in Australia, London and New York.
Leith Beal	<i>Consultant</i>	Mr Beal is a Mining Tenement Consultant with many years experience in the mining industry.
Michael Monsour	<i>Doctor</i>	Dr Michael Monsour is a Medical Practitioner with extensive interests in Queensland medical and dental centres.
Tim Hronsky	<i>Engineer</i>	Mr Hronsky is a Geological Engineer having graduated from the Western Australian School of Mines with a Degree in Engineering, Majoring in Geology.
John DuBois	<i>Executive</i>	As an IT executive Mr DuBois has extensive business management and sales and marketing experience across the Asia Pacific Region and has worked on a global basis for over 16 years.
Richard Payne	<i>Lawyer</i>	Mr Payne is a commercial solicitor and the principal of the legal firm Richard Payne & Associates.
Ashok Jacob	<i>Other CEO</i>	Mr Jacob is Chief Executive Officer of Consolidated Press Holdings Limited (CPH).
Timothy Fischer	<i>Politician</i>	Leader of the Federal National Party from 1990 to 1999 and from 1996 to 1999 was Minister for Trade and Deputy Prime Minister.
John Williams	<i>Scientist</i>	Mr Williams has 20 years experience as a geologist in Australia and overseas.

Table 2 – Professional Expertise of Directors

This table shows the number of directorships classified by type of professional expertise. Statistics are also shown for qualifications, gender and independence. The sample includes 1,548 ASX-listed firms in 2007. Variable definitions are provided in the Appendix.

	All Directorships	Non-Executive Directorships	Executive Directorships
Executives	4077	2701	1376
Accountants	1465	1058	407
Bankers	1102	822	280
Scientists	695	356	339
Lawyers	620	547	73
Engineers	375	237	138
Consultants	161	141	20
Politicians	85	83	2
Other CEOs	85	71	14
Academics	65	59	6
Doctors	61	41	20
Female	403	315	88
Independent	3378	3378	0
n	8791	6116	2675

Table 3 – Percentage of Firms with Each Type of Professional Expertise

This table shows the percentage of all firms and firms by industry with at least one director with the specific type of professional expertise on their board. The sample includes 1,548 ASX-listed firms in 2007. Variable definitions are provided in the Appendix.

	All Firms	Consumer Discretionary	Consumer Staples	Energy	Financial	Health Care	Industrials	Information Technology	Materials	Telecom Services	Utilities
Executives	85.92	98.57	100.00	78.06	75.10	97.10	99.42	100.00	76.41	100.00	95.83
Accountants	64.01	67.86	79.59	65.16	70.36	50.00	58.38	64.15	63.88	54.84	70.83
Bankers	39.41	30.71	34.69	29.68	81.03	36.23	26.59	32.08	31.11	32.26	41.67
Lawyers	33.98	39.29	20.41	37.42	38.34	28.99	27.75	26.42	35.70	35.48	33.33
Scientists	29.78	3.57	4.08	60.65	1.98	28.99	5.78	0.94	62.84	3.23	8.33
Engineers	18.67	3.57	0.00	32.26	5.14	4.35	21.39	2.83	35.49	6.45	12.50
Consultants	9.69	14.29	6.12	10.32	6.71	11.59	10.98	13.21	8.77	9.68	0.00
Politicians	5.36	5.00	10.20	2.58	3.95	5.80	10.40	11.32	3.34	0.00	12.50
Other CEOs	5.04	6.43	4.08	3.87	5.53	5.80	4.05	2.83	5.01	6.45	12.50
Academics	4.20	2.86	0.00	4.52	4.35	18.12	2.31	2.83	1.67	6.45	4.17
Doctors	3.36	0.71	0.00	0.65	1.58	31.16	0.00	0.94	0.42	0.00	0.00
No. firms	1,548	140	49	155	253	138	173	106	479	31	24

Table 4 – Board Characteristics

This table shows mean board characteristics for all firms and by industry for 1,548 ASX-listed firms in 2007. Notations denote results of mean t-tests as to whether the mean for the particular industry is higher than all other industries at the 1% ⁺⁺⁺, 5% ⁺⁺ and 10% ⁺ levels or lower than all other industries at the 1% ⁻⁻⁻, 5% ⁻⁻ and 10% ⁻ levels. Variable definitions are provided in the Appendix.

	All Firms	Consumer Discretionary	Consumer Staples	Energy	Financial	Health Care	Industrials	Information Technology	Materials	Telecom Services	Utilities
Board Size	5.68	6.30 ⁺⁺⁺	6.59 ⁺⁺⁺	5.05 ⁻⁻	6.03 ⁺⁺⁺	5.93	6.17 ⁺⁺⁺	5.44	5.14 ⁻⁻	6.13	6.75 ⁺⁺
% Independent	36.64	36.28	30.95	35.50	41.03 ⁺⁺⁺	43.06 ⁺⁺⁺	37.28	35.04	33.20 ⁻⁻⁻	39.80	41.72
% Females	4.05	6.22 ⁺⁺⁺	3.16	2.44 ⁻	6.07 ⁺⁺⁺	6.46 ⁺⁺⁺	3.83	3.80	2.42 ⁻⁻⁻	3.37	4.24
Duality	8.40	10.00	12.24	8.39	7.91	6.52	8.67	5.66	8.14	16.13	12.50
% Executives	44.70	64.04 ⁺⁺⁺	68.80 ⁺⁺⁺	33.65 ⁻⁻	29.22 ⁻⁻	54.72 ⁺⁺⁺	64.89 ⁺⁺⁺	63.66 ⁺⁺⁺	31.72 ⁻⁻	68.98 ⁺⁺⁺	57.96 ⁺⁺
% Accountants	17.04	16.56	16.80	18.18	20.06 ⁺⁺⁺	11.41 ⁻⁻⁻	14.25 ⁻	16.54	18.11 ⁺	14.19	17.95
% Bankers	12.10	5.98 ⁻⁻⁻	6.09 ⁻	6.73 ⁻⁻	37.38 ⁺⁺⁺	7.19 ⁻⁻⁻	5.51 ⁻⁻⁻	6.97 ⁻⁻⁻	8.31 ⁻⁻⁻	6.79	9.46
% Scientists	9.42	0.74 ⁻⁻⁻	0.92 ⁻⁻⁻	20.81 ⁺⁺⁺	0.46 ⁻⁻⁻	7.08	1.38 ⁻⁻⁻	0.19 ⁻⁻⁻	20.38 ⁺⁺⁺	0.36 ⁻⁻⁻	3.61 ⁻
% Lawyers	7.23	7.44	3.36 ⁻	8.35	8.42 ⁺	5.56 ⁻	5.28 ⁻	5.87	8.27 ⁺⁺	5.94	4.64
% Engineers	4.51	0.64 ⁻⁻⁻	0.00 ⁻⁻⁻	7.93 ⁺⁺⁺	0.95 ⁻⁻⁻	0.68 ⁻⁻⁻	4.38	0.82 ⁻⁻⁻	9.19 ⁺⁺⁺	1.00 ⁻	2.16
% Consultants	1.88	2.46	1.10	2.20	1.07 ⁻	2.09	1.88	2.80	1.99	1.28	0.00
% Politicians	0.91	0.58	1.84	0.53	0.68	0.86	1.76 ⁺⁺⁺	2.10 ⁺⁺⁺	0.59 ⁻	0.00	2.40 ⁺
% Other CEOs	0.83	0.94	1.09	0.59	0.82	0.87	0.45	0.39	1.04	0.76	1.36
% Doctors	0.71	0.10 ⁻	0.00	0.16 ⁻	0.34	6.56 ⁺⁺⁺	0.00 ⁻	0.19	0.11 ⁻⁻⁻	0.00	0.00
% Academics	0.66	0.49	0.00	0.87	0.61	2.98 ⁺⁺⁺	0.22 ⁻	0.49	0.28 ⁻⁻⁻	0.69	0.46
No. Expertise	2.99	2.73 ⁻⁻⁻	2.59 ⁻⁻⁻	3.25 ⁺⁺⁺	2.94	3.18 ⁺⁺	2.67 ⁻⁻⁻	2.58 ⁻⁻⁻	3.25 ⁺⁺⁺	2.54 ⁻	2.92
Expertise Index	0.53	0.45 ⁻⁻⁻	0.43 ⁻⁻⁻	0.61 ⁺⁺⁺	0.53	0.54	0.44 ⁻⁻⁻	0.44 ⁻⁻⁻	0.61 ⁺⁺⁺	0.42 ⁻⁻⁻	0.50
No. firms	1,548	140	49	155	253	138	173	106	479	31	24

Table 5 – Descriptive Statistics of Cross-sectional Sample

This table shows descriptive statistics of firm characteristics in Panel A and average number of types of expertise by firm location in Panel B. The sample includes 1,196 ASX-listed firms in 2007 with director data available from the Boardroom database from Conect4 and financial data available from the Aspect database. Location data is the primary registered office of firms collected from the corporate directory section of annual reports. The locations of ACT, TAS and NT are grouped together due to the small number of observations. Variable definitions are provided in the Appendix. Asterisks denote significance of mean tests of the number of expertise between the identified location and all other locations at 1% ***, 5% ** and 10% *.

Panel A – Firm Characteristics

	Mean	Median	Min	Max	Std
Total Assets (billions)	2.66	0.04	0.00	564.63	26.57
Tobin's Q	2.83	1.94	0.01	9.27	2.30
Return on Assets (%)	-9.59	0.39	-100.00	82.32	30.59
Growth (%)	57.13	21.42	-94.00	376.00	101.56
Debt to Total Assets	0.33	0.29	0.00	1.00	0.27
Board Size	5.74	5.00	3.00	17.00	2.16
% Independent	38.18	40.00	0.00	100.00	27.26
% Females	4.01	0.00	0.00	66.67	8.81
% Other Directorships	38.97	33.33	0.00	100.00	27.58
Duality	9.28	0.00	0.00	100.00	29.32
No. Expertise	3.02	3.00	1.00	7.00	1.02
Expertise Index	0.54	0.58	0.00	0.82	0.18
Industry Adjusted No. Expertise	1.01	0.94	0.31	2.35	0.33

Panel B – Location

	n	No. Expertise	t-statistic
WA	375	3.11	2.00**
NSW	355	2.99	-0.72
VIC	246	2.87	-2.59***
QLD	114	2.95	-0.84
SA	44	3.05	0.14
ACT/TAS/NT	11	2.91	-0.37
FOREIGN	51	3.51	3.48***

Table 6 – Professional Expertise Diversity

This table shows Poisson count and OLS models. Poisson count models examine the determinants of the number of types of professional expertise. OLS models examine determinants of industry adjusted number of expertise and the expertise index. The sample includes 1,196 ASX-listed firms in 2007 with director data available from the Boardroom database from Conect4 and financial data available from the Aspect database. Location data is the primary registered office of firms collected from the corporate directory section of annual reports. The locations of ACT, TAS and NT are grouped together due to the small number of observations. Variable definitions are provided in the Appendix. T-statistics (z-statistics) are in parentheses. Asterisks denote significance at 1% ***, 5% ** and 10% *.

	No. Expertise	Expertise Index	Industry Adjusted No. Expertise	No. Expertise (Lawyers, Consultants, Accountants, Bankers, Other CEOs)	No. Expertise (Other types of expertise)
Intercept	0.56*** (12.88)	0.37*** (13.70)	0.52*** (11.39)	-0.17** (-2.26)	-0.11* (-1.90)
Ln(Total Assets)	-0.01 (-1.53)	-0.01 (-1.25)	-0.01 (-1.36)	-0.01 (-0.87)	-0.01 (-1.30)
Return on Assets	-0.02 (-0.61)	-0.02 (-0.82)	-0.02 (-0.63)	0.11* (1.69)	-0.12** (-2.53)
Growth	0.01 (1.61)	0.01** (2.17)	0.01 (1.54)	0.02 (1.06)	0.01 (0.88)
Debt to Total Assets	0.02 (0.45)	0.01 (0.06)	0.02 (0.43)	0.13* (1.86)	-0.09 (-1.59)
Board size	0.07*** (15.64)	0.02*** (6.52)	0.08*** (14.63)	0.09*** (11.59)	0.06*** (7.70)
% Independent	0.09*** (2.97)	0.03 (1.61)	0.09*** (2.72)	0.04 (0.73)	0.14*** (3.12)
% Females	-0.08 (-0.80)	-0.04 (-0.66)	-0.08 (-0.78)	-0.14 (-0.76)	-0.06 (-0.42)
% Other Directorships	-0.02 (-0.65)	-0.01 (-0.31)	-0.02 (-0.51)	0.03 (0.62)	-0.08* (-1.80)
Duality	-0.03 (-1.05)	-0.02 (-1.11)	-0.03 (-0.95)	-0.05 (-0.94)	-0.01 (-0.22)
<i>Consumer Staples</i>	-0.04 (-0.64)	-0.01 (-0.11)	0.01 (0.20)	-0.05 (-0.44)	-0.03 (-0.56)
<i>Energy</i>	0.25*** (6.24)	0.16*** (6.85)	0.08* (1.92)	0.06 (0.85)	0.46*** (9.83)
<i>Financial</i>	0.13***	0.10***	0.06	0.27***	-0.14***

	(3.22)	(4.10)	(1.42)	(4.49)	(-2.37)
<i>Health Care</i>	0.20***	0.10***	0.05	-0.07	0.48***
	(4.49)	(3.59)	(1.04)	(-0.93)	(8.82)
<i>Industrials</i>	-0.02	-0.01	0.01	-0.25***	0.23***
	(-0.50)	(-0.53)	(0.11)	(-3.51)	(5.57)
<i>Information Technology</i>	0.02	0.01	0.08	-0.01	0.07
	(0.43)	(0.31)	(1.59)	(-0.04)	(1.32)
<i>Materials</i>	0.24***	0.15***	0.07*	0.03	0.46***
	(6.67)	(7.07)	(1.93)	(0.48)	(11.46)
<i>Telecom Services</i>	-0.07	-0.04	-0.01	-0.13	0.02
	(-0.88)	(-0.98)	(-0.03)	(-1.00)	(0.24)
<i>Utilities</i>	0.07	0.04	-0.01	-0.05	0.21**
	(0.76)	(0.81)	(-0.05)	(-0.30)	(2.35)
NSW	-0.04*	-0.03**	-0.04*	0.01	-0.09***
	(-1.65)	(-2.23)	(-1.64)	(0.18)	(-2.66)
VIC	-0.08***	-0.04***	-0.08***	-0.08*	-0.07*
	(-2.91)	(-2.72)	(-2.93)	(-1.67)	(-1.87)
QLD	-0.04	-0.02	-0.05	-0.11*	0.03
	(-1.21)	(-1.24)	(-1.31)	(-1.68)	(0.62)
SA	-0.01	-0.01	-0.01	-0.02	0.01
	(-0.15)	(-0.43)	(-0.17)	(-0.22)	(0.13)
ACT/TAS/NT	-0.03	-0.03	-0.05	0.09	-0.18
	(-0.40)	(-0.62)	(-0.56)	(0.69)	(-1.36)
FOREIGN	-0.01	-0.03	-0.01	0.01	-0.02
	(-0.28)	(-1.00)	(-0.17)	(0.18)	(-0.38)
R ²	0.30	0.19	0.26	0.22	0.30
n	1196	1196	1196	1196	1196

Table 7 – Expertise Diversity and Firm Value

This table shows OLS and 2SLS regression models, which relate the number of types of professional expertise to firm value. No. Expertise in the 2SLS specification is the predicted value. The sample includes 1,196 ASX-listed firms in 2007 with director data available from the Boardroom database from Conect4 and financial data available from the Aspect database. Location data is the primary registered office of firms collected from the corporate directory section of annual reports. The locations of ACT, TAS and NT are grouped together due to the small number of observations. Variable definitions are provided in the Appendix. T-statistics (z-statistics) are in parentheses. Asterisks denote significance at 1% ***, 5% ** and 10% *.

	Tobin's Q				ROA		
	OLS	2SLS	OLS	OLS	OLS	OLS	
Intercept	2.85*** (10.38)	2.16*** (3.49)	2.93*** (10.39)	2.83*** (10.27)	3.17*** (6.94)	2.83*** (10.23)	-0.04 (-1.18)
No. Expertise	0.07 (0.99)	0.64 (1.39)			-0.14 (-0.59)		
Expertise Index			0.01 (0.01)				
Industry Adj. No. Expertise				0.21 (1.10)			
No. Expertise ²					0.03 (0.88)		
No. Expertise (Lawyers, Consultants, Accountants, Bankers, Other CEOs)						0.04 (0.51)	0.01 (0.67)
No. Expertise (Other types of expertise)						0.11 (1.18)	-0.02** (-2.15)
Ln(Total Assets)	-0.16*** (-3.57)	-0.14*** (-2.99)	-0.17*** (-3.60)	-0.16*** (-3.57)	-0.16*** (-3.55)	-0.16*** (-3.51)	0.09*** (18.05)
Return on Assets	-1.97*** (-5.60)	-1.93*** (-5.53)	-1.97*** (-5.61)	-1.97*** (-5.59)	-1.97*** (-5.59)	-1.96*** (-5.58)	
Growth	0.23*** (3.98)	0.21*** (3.40)	0.24*** (4.03)	0.23*** (3.98)	0.23*** (3.99)	0.23*** (3.98)	0.04*** (5.59)
Debt to Total Assets	-0.67** (-2.29)	-0.70** (-2.41)	-0.66** (-2.28)	-0.67** (-2.28)	-0.67** (-2.30)	-0.66** (-2.26)	-0.28*** (-7.81)
Board size	0.01 (0.21)	-0.13 (-1.12)	0.02 (0.70)	0.01 (0.18)	0.01 (0.09)	0.01 (0.22)	-0.03*** (-6.98)
% Independent	0.40* (1.72)	0.25 (0.96)	0.42* (1.79)	0.40* (1.71)	0.40* (1.70)	0.39* (1.67)	-0.02 (-0.61)

% Females	-0.05 (-0.08)	0.12 (0.17)	-0.08 (-0.11)	-0.06 (-0.09)	-0.05 (-0.08)	-0.05 (-0.07)	0.12 (1.38)
% Other Directorships	0.47** (1.99)	0.50** (2.11)	0.47** (1.98)	0.47** (1.98)	0.48** (2.01)	0.48** (2.03)	-0.04 (-1.49)
Duality	-0.07 (-0.36)	-0.01 (-0.03)	-0.07 (-0.36)	-0.07 (-0.35)	-0.08 (-0.38)	-0.07 (-0.33)	0.01 (0.29)
<i>Consumer Staples</i>	-0.51 (-1.60)	-0.45 (-1.38)	-0.51 (-1.61)	-0.52 (-1.63)	-0.50 (-1.59)	-0.51 (-1.60)	-0.09** (-2.04)
<i>Energy</i>	-0.04 (-0.12)	-0.50 (-1.09)	0.02 (0.06)	-0.01 (-0.01)	-0.04 (-0.12)	-0.07 (-0.22)	-0.19*** (-6.45)
<i>Financial</i>	-0.66*** (-2.84)	-0.88*** (-3.02)	-0.63*** (-2.70)	-0.64*** (-2.82)	-0.66*** (-2.85)	-0.64*** (-2.75)	-0.07*** (-2.90)
<i>Health Care</i>	0.29 (0.87)	-0.04 (-0.10)	0.33 (0.99)	0.32 (0.98)	0.29 (0.87)	0.26 (0.75)	-0.25*** (-6.77)
<i>Industrials</i>	0.03 (0.13)	0.05 (0.22)	0.03 (0.12)	0.03 (0.11)	0.02 (0.10)	0.01 (0.03)	-0.02 (-0.67)
<i>Information Technology</i>	0.42 (1.23)	0.39 (1.14)	0.43 (1.24)	0.41 (1.19)	0.42 (1.22)	0.42 (1.22)	-0.06 (-1.54)
<i>Materials</i>	0.13 (0.51)	-0.33 (-0.75)	0.18 (0.71)	0.16 (0.67)	0.12 (0.49)	0.09 (0.38)	-0.19*** (-6.98)
<i>Telecom Services</i>	-0.19 (-0.40)	-0.08 (-0.17)	-0.20 (-0.42)	-0.20 (-0.42)	-0.20 (-0.42)	-0.20 (-0.41)	-0.04 (-0.49)
<i>Utilities</i>	-0.37 (-0.87)	-0.48 (-1.17)	-0.36 (-0.85)	-0.36 (-0.84)	-0.37 (-0.87)	-0.38 (-0.91)	-0.14*** (-4.30)
R ²	0.22	0.22	0.22	0.22	0.22	0.22	0.43
n	1196	1196	1196	1196	1196	1196	1196

Table 8 – Appointments and New Expertise

This table shows appointments that bring new expertise to the hiring board. The sample includes 584 appointments to ASX-listed firms during 2004-2007 where the appointment is recorded on the Boardroom database from Connect4 and is confirmed through ASX announcements, there is no other news around the announcement date (-1,+1), financial data is available from Aspect and stock price data is available from Sirca. Variable definitions are provided in the Appendix.

	New Expertise	Existing Expertise	Total
Executives	14	178	192
Bankers	58	46	104
Accountants	49	34	83
Engineers	35	17	52
Scientists	18	24	42
Lawyers	27	8	35
Consultants	25	1	26
Other CEOs	24	2	26
Politicians	7	3	10
Academics	10	0	10
Doctors	2	2	4
No. appointments	269	315	584

Table 9 – Appointment CARs and Expertise Diversity

Regressions relate CARs (-1,+1) as a percentage (%) to professional expertise, director, firm and industry characteristics. The sample includes 584 appointments to ASX-listed firms during 2004-2007 where the appointment is recorded on the Boardroom database from Connect4 and is confirmed through ASX announcements, there is no other news around the announcement date (-1,+1), financial data is available from Aspect and stock price data is available from Sirca. Variable definitions are provided in the Appendix. T-statistics are in parentheses. The coefficient on Doctor in the fourth specification is n/a because there are no appointments of doctors to firms outside the Health Care industry. Asterisks denote significance at 1% ***, 5% ** and 10% *.

	(1)	(2)	(3)
Intercept	-2.13 (-1.07)	-1.96 (-1.04)	-2.02 (-1.07)
New Expertise	-0.82 (-1.15)	-0.58 (-0.77)	-2.75** (-2.01)
New Expertise * (<i>Lawyers, Consultants, Accountants, Bankers, Other CEOs</i>)			3.65** (2.34)
Academic		0.48 (0.14)	2.42 (0.68)
Accountant		0.92 (0.99)	-0.08 (-0.09)
Banker		-1.00 (-1.12)	-2.07** (-2.38)
Consultant		-1.75 (-1.02)	-3.34* (-1.91)
Doctor		-14.42** (-2.26)	-13.67** (-2.13)
Engineer		0.31 (0.24)	1.62 (1.16)
Lawyer		-0.14 (-0.11)	-1.44 (-1.14)
Other CEO		-2.01 (-0.99)	-3.58* (-1.71)
Politician		-2.77 (-1.50)	-1.39 (-0.62)
Scientist		0.58 (0.37)	1.38 (0.84)
Female	3.90** (2.03)	3.86** (1.98)	3.94** (1.99)
Independent	-0.44 (-0.49)	-0.52 (-0.59)	-0.37 (-0.42)
Other Directorships	0.43* (1.81)	0.47** (2.03)	0.43* (1.86)
Interlocking	-1.64 (-1.55)	-1.69 (-1.55)	-1.63 (-1.56)
New Female	-3.08 (-1.39)	-2.94 (-1.33)	-2.84 (-1.27)
New Degree	0.56 (0.77)	0.58 (0.77)	0.53 (0.71)
Ln(Total Assets)	0.20 (1.04)	0.19 (1.06)	0.21 (1.13)
Return on Assets	0.42 (0.30)	-0.46 (-0.33)	-0.73 (-0.52)
Market-to-Book	0.10 (0.71)	0.05 (0.42)	0.04 (0.29)
Thin Trading	1.49* (1.95)	1.50** (2.02)	1.55** (2.08)
CEO Tenure	-0.07 (-1.20)	-0.07 (-1.38)	-0.08 (-1.46)
Independent Board	-0.25 (-0.37)	-0.25 (-0.37)	-0.24 (-0.35)
Industry dummies	Yes	Yes	Yes

Year dummies	Yes	Yes	Yes
R ²	0.042	0.076	0.084
n	584	584	584