Idiosyncratic Risk and Corporate Governance: An Empirical Analysis of Australian Listed Firms.

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This thesis is submitted in fulfilment of the requirements of the degree of

Doctor of Philosophy

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Statement of Originality

This work has not previously been submitted for a degree or diploma in any university, and to the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Signed............................................................

Delia M. Hovey.

29th January, 2014
# Table of Contents

Statement of Originality ............................................................................................................................................. i

Table of Contents ......................................................................................................................................................... ii

Table of Figures ........................................................................................................................................................... vi

Table of Equations ...................................................................................................................................................... vi

Acknowledgements ....................................................................................................................................................... vii

Abstract ......................................................................................................................................................................... 1

Chapter 1 Introduction ................................................................................................................................................. 2
  1.1. Idiosyncratic Risk ................................................................................................................................................. 3
  1.2. Corporate Governance ........................................................................................................................................ 4
  1.3. The Relationship between Idiosyncratic Risk and Corporate Governance ...................................................... 7
  1.4. Summary and Concluding Comments ................................................................................................................. 8

Chapter 2 Theory, Evidence and Background Discussion ......................................................................................... 10
  2.1. Introduction .......................................................................................................................................................... 10
  2.2. Idiosyncratic Risk – Theory, Evidence, and Background Discussion ............................................................... 11
    2.2.1. Idiosyncratic Risk and Information Flow .................................................................................................. 11
    2.2.2. Idiosyncratic Risk, Market Efficiency and the Pricing of Idiosyncratic Risk ............................................. 12
    2.2.3. Idiosyncratic Risk and Behavioural Finance ............................................................................................ 13
    2.2.4. Idiosyncratic Risk in both Bull and Bear Markets ..................................................................................... 14
    2.2.5. Idiosyncratic Risk and Growth ................................................................................................................... 14
    2.2.6. Idiosyncratic Risk and Leverage ................................................................................................................ 15
    2.2.7. Idiosyncratic Risk and Firm Size ................................................................................................................. 16
    2.2.8. Idiosyncratic Risk and Liquidity ................................................................................................................ 16
    2.2.9. Diversification, Risk and Return ................................................................................................................ 17
    2.2.10. Idiosyncratic Risk and Expected Returns: Some Conflicting Evidence ................................................. 18
    2.2.11. Idiosyncratic Risk, and Firm Performance, Value and Returns ............................................................... 19
  2.3. Corporate Governance - Theory, Evidence, and Background Discussion ....................................................... 23
    2.3.1. Theoretical Models and Concepts .............................................................................................................. 23
    2.3.2. The Anglo-US Corporate Form and Model of Corporate Governance .................................................. 27
    2.3.3. Principles for Good Corporate Governance and the Board of Directors ............................................. 28
    2.3.4. Board Structure and Composition ............................................................................................................ 30
    2.3.5. Ownership Structure .................................................................................................................................. 34
    2.3.6. Composite Measures of Corporate Governance ....................................................................................... 38
    2.3.7. Corporate Governance and the Global Financial Crisis .......................................................................... 39
    2.3.8. Internal and External Governance Controls ............................................................................................. 40
    2.3.9. Corporate Governance and the Australian Listed Market .................................................................... 41
    2.3.10. Corporate Governance, Firm Performance and Value .......................................................................... 44
Chapter 3 Research Methodology ........................................................................53
  3.1. Introduction .................................................................................................53
  3.2. Focus of the Study ......................................................................................54
  3.3. Research Questions ....................................................................................55
      3.3.1. Research Question 1 ........................................................................56
      3.3.2. Research Question 2 ........................................................................57
      3.3.3. Sub-Research Question ......................................................................58
  3.4. Review of Methods Relevant to the Study .................................................59
  3.5. Theoretical Motivation ...............................................................................61
  3.6. Aims of the Study ......................................................................................65
  3.7. Expected Findings and Outcomes ..............................................................66
  3.8. Identification and Description of the Models ...........................................67
      3.8.1. Ordinary Least Squares (OLS) ..........................................................68
      3.8.2. Two-Stage Least Squares (2SLS) .......................................................68
      3.8.3. Test for endogeneity ..........................................................................69
  3.9. Regression Models ....................................................................................70
      3.9.1. Pooled OLS Regressions ...................................................................70
      3.9.2. Pooled 2SLS Regressions (instrumental variables approach) .........72
      3.9.3. Annual OLS Regressions ...................................................................74
  3.10. Data Selection and Description of the Variables ......................................76
      3.10.1. Data Selection ..................................................................................76
  3.11. Description of the Variables ....................................................................79
      3.11.1. Dependent Variables .......................................................................79
      3.11.2. Independent Variables ....................................................................82
  3.12. Summary and Concluding Comments ....................................................96

Chapter 4 Results ...............................................................................................99
  4.1. Introduction .................................................................................................99
  4.2. Focus of the Study ......................................................................................99
  4.3. Research Questions ...................................................................................101
      4.3.1. Research Question 1 ........................................................................102
      4.3.2. Research Question 2 ........................................................................103
      4.3.3. Sub-Research Question ......................................................................104
  4.4. Descriptive Statistics ...............................................................................105
      4.4.1. Pooled Data ......................................................................................105
      4.4.2. Annual Data ......................................................................................106
  4.5. Regression Analyses and Results ..............................................................112
4.5.1. Idiosyncratic Volatility and Corporate Governance ........................................... 112
4.5.2. Firm Performance and Corporate Governance ..................................................... 138
4.5.3. Overall Discussion of Key Findings for Idiosyncratic Volatility and Corporate Governance ........................................................................................................ 158
4.5.4. Overall Discussion of Key Findings for Tobin’s Q and Corporate Governance .... 162
4.5.5. Key Findings that Imply a Link between Corporate Governance, Idiosyncratic Volatility and Firm Performance ................................................................. 166
4.6. Summary and Conclusions ...................................................................................... 167

Chapter 5 Summary of Findings ..................................................................................... 171
5.1. Introduction ............................................................................................................... 171
5.2. Primary Focus and Aims of the Study ..................................................................... 172
5.3. Main Conclusions ..................................................................................................... 173
  5.3.1. Idiosyncratic Volatility and Ownership Structure .............................................. 173
  5.3.2. Idiosyncratic Volatility and Board Composition .............................................. 174
  5.3.3. Tobin’s Q and Ownership Structure .................................................................. 175
  5.3.4. Tobin’s Q and Board Composition .................................................................... 175
  5.3.5. Link between Corporate Governance, Idiosyncratic Volatility and Firm Performance ........................................................................................................... 176
5.4. Final Conclusions ................................................................................................... 178

List of References ......................................................................................................... 180

Appendices .................................................................................................................. 197
Appendix 1 – Regression Results for ROA and ROE .................................................... 197
Appendix 2 – Methods for Estimating Idiosyncratic Volatility .................................... 214
Appendix 3 – DataStream Corporate Governance Score ............................................ 217
Table of Tables

Table 3.1 Number of Firms included in the Dataset for Each Year ......................78
Table 3.2 Description of the Variables ...............................................................94
Table 4.1 Descriptive Statistics (EOFY Pooled Data, 2006-2011) ......................105
Table 4.2 Descriptive Statistics (Annual Data, 2006-2011) ...............................106
Table 4.3 Pooled OLS Results for Idiosyncratic Volatility and Ownership Structure..................................................................................................................113
Table 4.4 Pooled OLS Results for Idiosyncratic Volatility, Ownership and Board Characteristics..............................................................................................................118
Table 4.5 Pooled 2SLS Results for Idiosyncratic Volatility, Ownership and Board Characteristics..............................................................................................................128
Table 4.6 Annual OLS Results for Idiosyncratic Volatility and Ownership Structure..................................................................................................................133
Table 4.7 Annual OLS Results for Idiosyncratic Volatility, Ownership and Board Characteristics..............................................................................................................135
Table 4.8 Pooled OLS Results for Tobin’s $Q$ and Ownership Structure ..........139
Table 4.9 Pooled OLS Results for Tobin’s $Q$, Ownership and Board Characteristics..................................................................................................................141
Table 4.10 Pooled 2SLS Results for Tobin’s $Q$, Ownership and Board Characteristics..................................................................................................................148
Table 4.11 Annual OLS Results for Tobin’s $Q$ and Ownership Structure ........154
Table 4.12 Annual OLS Results for Tobin’s $Q$ and Ownership and Board Characteristics..................................................................................................................156
Table 4.13 Summary of Significant Findings Implying a Link between Corporate Governance and Idiosyncratic Volatility and Firm Performance ..................167
Table A.1 Pooled OLS Results for ROA and Ownership Structure ...............198
Table A.2 Pooled OLS Results for ROA, Ownership and Board Characteristics ..........................................................................................................................201
Table A.3 Pooled 2SLS Results for ROA, Ownership and Board Characteristics ..........................................................................................................................204
Table A.4 Pooled OLS Results for ROE and Ownership Structure ...............206
Table A.5 Pooled OLS Results for ROE, Ownership and Board Characteristics ..........................................................................................................................209
Table A.6 Pooled 2SLS Results for ROE, Ownership and Board Characteristics ..........................................................................................................................212
### Table of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Idiosyncratic Volatility and Tobin’s $Q$, 2006 to 2011</td>
<td>109</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Institutional Ownership, 2006 to 2011</td>
<td>109</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Insider Ownership, 2006 to 2011</td>
<td>110</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Voting Power of the Single Biggest Blockholder, 2006 to 2011</td>
<td>110</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Non-executive Directors, 2006 to 2011</td>
<td>111</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Women on the Board, 2006 to 2011</td>
<td>111</td>
</tr>
</tbody>
</table>

### Table of Equations

<table>
<thead>
<tr>
<th>Equation</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation 1</td>
<td>Idiosyncratic Volatility and Ownership Structure</td>
<td>71</td>
</tr>
<tr>
<td>Equation 2</td>
<td>Performance and Ownership Structure</td>
<td>71</td>
</tr>
<tr>
<td>Equation 3</td>
<td>Idiosyncratic Volatility, Ownership and Board Characteristics</td>
<td>72</td>
</tr>
<tr>
<td>Equation 4</td>
<td>Performance, Ownership and Board Characteristics</td>
<td>72</td>
</tr>
<tr>
<td>Equation 5</td>
<td>Idiosyncratic Volatility, Ownership and Board Characteristics</td>
<td>73</td>
</tr>
<tr>
<td>Equation 6</td>
<td>Performance, Ownership and Board Characteristics</td>
<td>74</td>
</tr>
<tr>
<td>Equation 7</td>
<td>Idiosyncratic Volatility and Ownership Structure</td>
<td>75</td>
</tr>
<tr>
<td>Equation 8</td>
<td>Performance and Ownership Structure</td>
<td>75</td>
</tr>
<tr>
<td>Equation 9</td>
<td>Idiosyncratic Volatility, Ownership and Board Characteristics</td>
<td>75</td>
</tr>
<tr>
<td>Equation 10</td>
<td>Performance, Ownership and Board Characteristics</td>
<td>75</td>
</tr>
<tr>
<td>Equation 11</td>
<td>Idiosyncratic Volatility</td>
<td>80</td>
</tr>
<tr>
<td>Equation 12</td>
<td>Tobin’s $Q$ - Chung and Pruitt model</td>
<td>81</td>
</tr>
</tbody>
</table>
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Abstract

The primary focus of this study is on the relationship between idiosyncratic risk and corporate governance, and the first research question is based on this. A secondary focus of the study is on the relationship between firm performance and corporate governance, and the second research question is based on this. Then, a potential corporate governance-to-idiosyncratic volatility-to-firm performance link is considered.

In this study, corporate governance is approached in the context of internal governance controls, based on board structure and composition, and also ownership and ownership structure. These are essential elements of corporate governance, and relevant for studies pertaining to a market with internal-governance-control characteristics, such as the Australian market.

The Australian market provides for a unique study based on a market with its distinct characteristics. It is a market with internal-governance-control characteristics that operates in an internal-governance-control system. That is, a corporate governance environment that is largely recommendations based, and that relies heavily on firm-level internal governance controls rather than external controls for the maintenance of good corporate governance and firm performance. Therefore, this study has applied data drawn from firms listed under the aforementioned internal-governance-control market conditions, recommendations and requirements of the Australian Securities Exchange (ASX). The data used in this study is taken from the ASX300, the top 300 listed firms for the years 2006-2011.

The primary conclusion of this study is that there is a clear relationship between idiosyncratic risk and corporate governance. Specifically, this study finds consistent and highly significant relationships between idiosyncratic volatility and a number of firm-level corporate governance variables. These variables include among others, the percentage voting power of the single biggest blockholder, the percentage of women on the board, and the average number of other corporate affiliations of the board members. The second conclusion of the study is that there is a relationship between Tobin’s $Q$ and corporate governance. Thus, based on these conclusions, a link between corporate governance, idiosyncratic volatility, and firm performance is implied.

The current study differs from previous studies on idiosyncratic risk, and also previous corporate governance studies, in its focus on a relationship between idiosyncratic risk and corporate governance in the context of internal governance controls, and the noteworthy findings and conclusions. Hence, this study adds a valuable contribution to the knowledge and literature on the relationship between idiosyncratic risk and corporate governance, and also to the streams of literature on both idiosyncratic risk, and corporate governance.
Idiosyncratic Risk and Corporate Governance:  
An Empirical Analysis of Australian Listed Firms

Chapter 1 INTRODUCTION

This chapter is an introduction to the thesis and the material covered in the study. Its structure is as follows. Section 1.1 offers a brief overview of idiosyncratic risk. Section 1.2 contains a brief overview of corporate governance. Section 1.3 discusses the relationship between idiosyncratic risk and corporate governance, while Section 1.4 contains the chapter summary and concluding comments.

The dissertation makes a unique and important contribution to studies on both idiosyncratic risk and corporate governance, and on idiosyncratic risk in relation to corporate governance. The study primarily examines the relationship between idiosyncratic volatility and corporate governance, and also firm performance and corporate governance. To date, research is limited on the relationship between idiosyncratic risk and corporate governance, particularly in a market with internal-governance-control characteristics, such as the Australian market. There are many studies examining the relationship between firm performance and corporate governance. This was initially planned as a robustness test. However, there are aspects of the analysis and results that contribute to the literature, and will be reported.

In this study, corporate governance is approached from a finance perspective in terms of firm-level, internal governance controls, using a unique set of corporate governance variables, incorporating elements of both board structure and ownership structure as these are identified in the literature as important factors in corporate governance, and more relevant for studies pertaining to markets with internal-governance-control characteristics. Therefore this study analyses corporate governance variables based on board structure and composition, and also ownership structure, and the relationship of these variables to both idiosyncratic volatility, and firm performance.

The dissertation is structured as follows. Chapter 1 is an introductory chapter that contains a brief description and overview of both idiosyncratic risk and corporate governance. Chapter 2 provides background, theory and evidence pertaining to the study. The research methodology, including the theoretical motivation, focus, and aims of the
study are contained in Chapter 3. The data selection, description of the variables, and identification and description of the models are also contained in Chapter 3. The descriptive statistics, the presentation and analysis of results, and the main findings are contained in Chapter 4. Chapter 5 presents overall and final conclusions.

1.1. Idiosyncratic Risk

Total risk of a firm’s stock is made up of both systematic (market wide) risk and unsystematic (firm specific) risk. Idiosyncratic risk is that component of total risk that is unique and specific to a particular firm. Levels of idiosyncratic risk among individual firms can be due to various factors, including unique-to-the-firm characteristics such as for example, firm size, leverage, growth potential, management style, line of business, and industry sector, and the degree of dispersion and liquidity of a firm’s stock (see for example, and related discussion, Campbell, Lettau, Malkiel, and Xu, 2001; Malkiel and Xu, 1997; Xu and Malkiel, 2003). For instance, Malkiel and Xu (1997) found that there is a strong relationship between levels of idiosyncratic volatility for an individual stock, and the size of the firm, whereby the smaller the firm, the greater the degree of idiosyncratic volatility. Malkiel and Xu (1997) confirmed earlier findings of Fama and French (1992) that there was little or no relationship between beta and expected returns, and that firm size was a better risk proxy compared to beta.

Idiosyncratic risk can also be due to firm-specific shocks or catastrophes, including events such as natural disasters, equipment or infrastructure failures, and labour problems. There are many other factors that impact on firm-level idiosyncratic volatility including the degree of voluntary disclosure of information, and the release and circulation of specific information relevant to the firm via analyst’s reports and predictions. Then there are factors such as seasonal effects (affecting supply and demand), and the location (i.e. country/region) of the firm’s operations. All of these factors and many more can impact on an individual firm’s level of unique firm-specific risk, and therefore the level of idiosyncratic risk inherent in the firm’s stock.

From a corporate finance perspective there are many aspects of idiosyncratic risk examined in the literature, including among others, the information content of idiosyncratic risk (see for example, Durnev, Mórcck, and Yeung, 2004; Durnev, Mórcck, Yeung, and Zarowin, 2003; Ferreira and Laux, 2007), idiosyncratic risk and market efficiency (see for example, Angelidis, 2010; Durnev et al. 2004; Mórcck, Yeung, and Yu, 2000), the pricing
Angelidis (2010) found that developed, more efficient markets contain higher levels of idiosyncratic volatility relative to less efficient emerging markets. This would indicate that the more efficient markets, with greater information flow and information-rich security prices, contain higher levels of idiosyncratic volatility. It would follow then that an efficient capital market is one that contains higher levels of idiosyncratic volatility, or alternatively, higher idiosyncratic volatility creates a more efficient market. Therefore, at various levels of market efficiency, and availability of information, idiosyncratic volatility is priced in the market, along with the market factor, and other risk factors (see for example, Drew et al. 2004; Drew et al. 2005). Hence, idiosyncratic volatility is influential and relevant for market efficiency, asset price formation, investment returns, firm value and performance (see for example, Drew et al. 2004; Drew et al. 2005; Fu, 2009; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997; Miller et al. 2002; Xu and Malkiel, 2003).

An important dynamic further highlighting the relevance and importance of idiosyncratic risk in today’s corporate and investment environment, is the relationship between idiosyncratic risk and corporate governance. The quality of a firm’s corporate governance is a key idiosyncratic aspect to be considered (see for example, Ferreira and Laux, 2007). Accordingly, the relationship between idiosyncratic risk and corporate governance is the primary focus of this study. This is discussed further in Section 1.3 and Chapter 2, Sections 2.4 and 2.5. Idiosyncratic risk is discussed in more detail in Chapter 2, Section 2.2.

1.2. Corporate Governance

Corporate governance covers many aspects including issues to do with a company’s charter, legal framework, distribution of ownership rights, and the rights of financial and non-financial stakeholders. It is a structured system of organisational policies, procedures, mechanisms, controls and compliances that are put in place for the protection of shareholders, and for the prevention and resolution of conflicts of interest.
Corporate governance is concerned with the wellbeing of the company and its shareholders, and ultimately all of the stakeholders (see for example, Denis and McConnell, 2003; Donaldson, 1990; Shleifer and Vishny, 1997; Turnbull, 1997 and 2002). It is a set of principles and associations that provide control, while also impacting on the direction and performance of a firm (see for example, Cadbury, 1992; Leeson, Di Sisto, and Flanders, 2010). Furthermore, from a purely finance perspective, corporate governance attempts to provide a safer environment, whereby shareholders and other financial stakeholders can be more confident of receiving a return on invested capital (Shleifer and Vishny, 1997).

In corporate finance there are a number of theoretical models and concepts that underpin corporate governance, such as agency theory, which is born out of the finance model (see, Jensen and Meckling, 1976; Ross, 1973). The finance model holds that the primary goal of the firm is for shareholder wealth maximisation (see for example, and related discussion, Blair, 1995; Shleifer and Vishny, 1997). Further, the finance model is concerned with the problems that are created by the separation of ownership and control that is typical of the Anglo-US form of corporation. This is because the principle-agent relationship creates an environment for potential conflicts of interest (see, Jensen and Meckling, 1976; Ross, 1973), and uncertainty for shareholders (see, Shleifer and Vishny, 1997). To help reduce conflicts of interest and uncertainty for shareholders, corporate governance systems need to be in place and functioning effectively. Typically, for the Anglo-US form of corporation, these systems include both internal governance controls, and external market based controls (see for example, and related discussion, Blair 1995; Shleifer and Vishny, 1997; Walsh and Seward, 1990).

The Australian market is based on the Anglo-US model of corporate governance, and is a mature, well-organised market. However, it does not have an active market for corporate control, as in the US and UK (see for example, Dignam and Galanis, 2004; Pham, Suchard, and Zein, 2011 and 2012). The system of corporate governance in Australia relies heavily on firm-level internal governance controls, rather than external controls for the maintenance of good corporate governance and firm performance. It should be noted that whilst there are mergers and takeovers in this market, they are not common phenomena (see for example, and related discussion, Christensen, Kent and Stewart, 2010; Kiel and Nicholson, 2003; Pham, et al. 2011 and 2012).

Walsh and Seward (1990) argue that both internal and external controls are important governance mechanisms of control that can work together. However, they suggest that firms in a well-organised capital market, should, in practice, be overall better off to make amendments to internal controls. Moreover, where suitable internal
governance control mechanisms are in place, and working effectively, there should be no need for external corporate control. Notwithstanding, corporate control contests are still commonplace in markets such as the US (see, Walsh and Seward, 1990). Therefore, an efficient and well-organised capital market such as the Australian market, is better off in the long-run to foster elements that lead to improvements to internal governance controls, rather than go down the path of external corporate control contests, and costly takeover cycles (see for example, and related discussion, Walsh and Seward, 1990).

In addition, Australian firms function in a corporate governance environment of best practice guidelines, principles, and recommendations. The Australian corporate governance environment is largely recommendations based, following an “if not”, “why not” approach. Further, ASX recommendations are largely non-mandatory for the majority of listed firms (see, ASX, 2012; Christensen, et al. 2010; Henry, 2008). This is in contrast to the mandatory rules-based regime of the US (see, Arcot, Bruno, and Faure-Grimaud, 2010). All of these factors combined, contribute to the uniqueness of the Australian market and system of corporate governance (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012). See Chapter 2, Section 2.3.9, for further discussion on corporate governance in the Australian market.

Therefore, the Australian market is a market with internal-governance-control characteristics that operates in an internal-governance-control system. From here on in this thesis, markets that encompass these characteristics will be noted as markets with internal-governance-control characteristics. Further, a system of corporate governance that relies heavily on internal governance controls rather than external controls will be noted as an internal-governance-control system.

The board of directors plays a vital role in the governance of an organisation, and in particular, in markets that operate in an internal-governance-control system. This is due to the importance of firm-level internal governance mechanisms in the governance of such firms and markets. Ownership structure is another vitally important element of corporate governance in this context, and is a major determinant of the balance of power within a company. Both board structure and ownership structure are discussed further in Chapter 2, Sections 2.3.3, 2.3.4 and 2.3.5.
1.3. The Relationship between Idiosyncratic Risk and Corporate Governance

As discussed in Section 1.1 above, idiosyncratic risk is found to be relevant and important for equity returns, firm valuation and performance, and is a good risk proxy, that is priced in the market (see for example, Drew et al. 2004; Drew et al. 2005; Malkiel and Xu, 1997; Xu and Malkiel, 2003). However, for well-functioning, fair and efficient financial markets, there needs to be an effective corporate governance system in place. This is important for the financial protection and wellbeing of minority and outside shareholders and other financial stakeholders, and for the economic wellbeing and stability of firms, markets, the economy, and ultimately the wider community (see for example, La Porta, de Silanes, Shleifer, and Vishny, 2000; Shleifer and Vishny, 1997). The literature reports that firm-level corporate governance impacts on equity prices, firm value and performance, where, good corporate governance leads to better firm performance, while weak corporate governance increases costs and leads to poorer performance (see for example, Albuquerque and Wang, 2008; Cremers and Nair, 2005; Ferreira and Laux, 2007; Giroud and Mueller, 2011; Gompers, Ishii, and Metrick, 2003; Li and Naughton, 2007; Nguyen and Faff, 2006).

The literature also reports that idiosyncratic risk possesses predictive powers for stock market returns for a diversified portfolio of risky assets, and is a relevant and contributing factor for expected returns, firm value and performance (see for example, Drew et al. 2004; Drew et al. 2005; Fu, 2009; Goyal and Santa-Clara, 2003; Guo and Savickas, 2008; Malkiel and Xu, 1997; Miller et al. 2002).

Ferreira and Laux (2007) studied the relationship between corporate governance (mostly in terms of governance policy on anti-takeover provisions), and idiosyncratic risk (mostly in terms of idiosyncratic information flow). They suggest that greater transparency and openness to the discipline of the market leads to greater idiosyncratic information flow. Moreover, the greater the idiosyncratic information flow, the greater the level of idiosyncratic volatility, yet at the same time, the greater the level of idiosyncratic volatility, the greater the degree of idiosyncratic information, leading to more information-rich security prices. Further, this dynamic leads to better corporate governance, in that it fosters elements that are indications of good corporate governance, such as better decision making by management, more optimal capital budgeting, and more efficient capital investment (Ferreira and Laux, 2007).

The relationship between idiosyncratic risk and corporate governance is the primary focus of this study. However, the current study does not focus on the information
content of idiosyncratic volatility established by Ferreira and Laux (2007), nor governance policy on anti-takeover provisions. The current study, instead, examines the relationship between idiosyncratic risk and corporate governance, in terms of idiosyncratic returns volatility, and corporate governance in the context of internal governance controls. The study of internal governance controls based on board structure and ownership structure is appropriate for a market with internal-governance-control characteristics such as the Australian market. Therefore, the primary focus of this study is on the relationship between idiosyncratic risk and corporate governance in this context. See Chapter 2, Section 2.4, for more discussion on the relationship between idiosyncratic risk and corporate governance.

1.4. Summary and Concluding Comments

Chapter 1 has provided an introduction to the study of idiosyncratic risk and corporate governance, and the relationship between these two dynamic elements of corporate finance. Idiosyncratic risk is described as that component of total risk that is unique to a firm, and is due to firm-specific characteristics that include among others, line of business, firm size and management style (see for example, Campbell et al. 2001; Malkiel and Xu, 1997; Xu and Malkiel, 2003). The chapter introduces discussion on some of the many aspects of idiosyncratic risk examined in the literature, including the information content of idiosyncratic risk, market efficiency and idiosyncratic risk, and the pricing of idiosyncratic risk. The quality of a firm’s corporate governance is a very important firm-specific aspect to be considered, and the relationship between idiosyncratic risk and corporate governance is the primary focus of the study.

Corporate governance from a finance perspective may be described simply as a system providing guidance, direction and control, plus assurance that management and shareholder interests are aligned (see for example, Cadbury, 1992; Leeson et al. 2010; Walsh and Seward, 1990). Corporate governance is concerned with the protection of shareholder rights and the maximization of shareholder wealth (see for example, Blair, 1995; Shleifer and Vishny, 1997). Both the board of directors and ownership structure are important elements of corporate governance, particularly in the context of a market with internal-governance-control characteristics as analysed in this study.

The literature finds idiosyncratic risk to be relevant and of great consequence for equity returns, firm valuation and performance, and is a good risk proxy that is priced in
the market (see for example, Drew et al. 2004; Drew et al. 2005; Malkiel and Xu, 1997; Miller et al. 2002; Xu and Malkiel, 2003). The literature reports that firm-level corporate governance also impacts on equity prices, firm value and performance (see for example, Albuquerque and Wang, 2008; Cremers and Nair, 2005; Ferreira and Laux, 2007; Giroud and Mueller, 2011; Gompers et al. 2003; Nguyen and Faff, 2006), and is necessary for the wellbeing of companies and their shareholders, and ultimately all other stakeholders (see for example, Denis and McConnell, 2003; Donaldson, 1990; Shleifer and Vishny, 1997; Turnbull, 1997 and 2002). Therefore, both idiosyncratic risk and corporate governance are dynamic elements impacting on investors, firms and markets.

In addition, this chapter has discussed the unique aspects and internal-governance-control characteristics of the Australian listed market, and the importance of internal governance control mechanisms, based on board structure and ownership structure for the maintenance of good corporate governance and firm performance in a market with these characteristics. Therefore, the relationship between idiosyncratic risk and corporate governance in the context of a market with internal-governance-control characteristics is the primary focus of the study.

This dissertation will add a valuable contribution to the sparse research on the relationship between idiosyncratic risk and corporate governance, and to the knowledge and literature on both idiosyncratic risk and corporate governance.
Chapter 2  THEORY, EVIDENCE AND BACKGROUND

DISCUSSION

2.1. Introduction

Chapter 2 contains a review of theory, evidence and background discussion on both idiosyncratic risk and corporate governance, and the relationship between idiosyncratic risk and corporate governance. Section 2.1 provides a brief overview of theory, evidence, and background discussion concerned with idiosyncratic risk. Section 2.2 provides a brief overview of theory, evidence, and background discussion pertaining to corporate governance. Section 2.3 discusses the relationship between idiosyncratic risk and corporate governance. This is followed by the chapter summary and conclusions.

The literature reveals that idiosyncratic risk is an important factor impacting on firms and markets, equity returns, firm value and performance (see for example, Drew et al. 2004; Drew et al. 2005; Fu, 2009; Goyal and Santa-Clara, 2003; Guo and Savickas, 2008; Malkiel and Xu, 1997; Miller et al. 2002). However for markets to develop and maintain optimal efficiency and value there also needs to be an effective corporate governance system in place. Hence, an important facet of idiosyncratic risk is the relationship between idiosyncratic risk and corporate governance.

A review of the literature reveals a sparseness of studies in this important area, particularly so for a well-functioning, organised and efficient market, such as the Australian market, which operates in an internal-governance-controlled-system. Therefore there is a need for research into the relationship between idiosyncratic risk and corporate governance in this context. This relationship is the primary focus of the study.

The current study differs from previous studies on idiosyncratic risk, and also previous corporate governance studies. This study primarily focuses on the relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics that relies heavily on internal governance controls for the maintenance of good corporate governance and firm performance. Hence, this study will contribute to the knowledge and literature on the relationship between idiosyncratic risk and corporate governance, and to the streams of literature on both idiosyncratic risk and corporate governance.
2.2. Idiosyncratic Risk – Theory, Evidence, and Background Discussion

This section reviews a number of facets of idiosyncratic risk contained in the literature. These include idiosyncratic risk and information flow, idiosyncratic risk and market efficiency, idiosyncratic risk and behavioural finance, idiosyncratic risk in both bull and bear markets, idiosyncratic risk diversification and returns, idiosyncratic risk and growth, idiosyncratic risk and leverage, idiosyncratic risk and firm size, idiosyncratic risk and liquidity, and idiosyncratic risk and investment returns, value and performance.

2.2.1. Idiosyncratic Risk and Information Flow

The greater the degree of firm-level idiosyncratic information, the greater the firm-level idiosyncratic volatility, however, at the same time, the greater the level of idiosyncratic volatility, the greater the degree of idiosyncratic information. This leads to more information-rich stock prices and informed trading (see, Durnev et al. 2004; Ferreira and Laux, 2007; Môrck et al. 2000). Moreover, this dynamic also leads to better corporate governance, in that it fosters elements that are indications of good corporate governance such as better decision making by management, more optimal capital budgeting, and more efficient capital investment (see, Durnev et al. 2004; Ferreira and Laux, 2007; Môrck et al. 2000). Therefore, where idiosyncratic volatility is greater, prices are closer to their fundamental values, and there is a closer alignment between a firm’s capital budgeting and the goal of shareholder wealth maximisation (see, Durnev et al. 2004; Ferreira and Laux, 2007; Môrck et al. 2000).

On the other hand, it is suggested that the less information out there the better, in that the market value of a firm’s equity can be increased where there is idiosyncratic uncertainty through a lack of information and mixed messages about firm performance. Moreover, the less information available regarding the firm and the more ambiguous and conflicting the reports, the better it is for the firm’s stock price (see, Diether, Malloy, and Scherbina, 2002; Johnson, 2004). It is also suggested that investors are prepared to pay a premium for idiosyncratic uncertainty, indicating that transparent disclosures are not always in the best interests of the firm (see, Diether, Malloy, and Scherbina, 2002; Johnson, 2004).

Hermalin and Weisbach (2007) discuss that greater transparency allows for better monitoring of management while also providing a signalling effect regarding the performance of the CEO. However, they point out that there are both costs and benefits
associated with greater transparency. Therefore, they argue that there is an optimal level of transparency and beyond that point, firm value and performance suffers (Hermalin and Weisbach, 2007).

2.2.2. Idiosyncratic Risk, Market Efficiency and the Pricing of Idiosyncratic Risk

Security prices fluctuate over time and, according to the efficient market hypothesis (EMH), this is due in large part to new information becoming available to the market. Some information may apply to the market as a whole and some information may be specific to a particular firm. Investors adjust their expectations and reassess security values based on new information as it becomes available in the marketplace. If prices quickly and correctly adjust to reflect new information, then such a market is said to be efficient (see, Fama, 1998). Therefore, according to the EMH, an efficient capital market is a market where all available information is reflected in security prices. Moreover, security values will fully and quickly reflect this information. The EMH asserts that well-organised capital markets (such as for example, the New York Stock Exchange (NYSE) and the Australian Securities Exchange (ASX)) are efficient. In the EMH framework, while some elements of inefficiency may exist, they are usually of no great consequence and not very common (see for example, and related discussion, Fama, 1998; Malkiel, 2005a).

Factors that impact on the level of efficiency of a market include the extent of competition and trading (see for example, Fama, 1998; Malkiel, 2005a), the type of information available, and how quickly stock prices reflect that information (see for example, Fama, 1965; Fama, 1998). Jegadeesh and Titman (1993) suggest that excess return is not necessarily due to market factors as expected, but more often due to delayed price reactions to idiosyncratic information. This would indicate that idiosyncratic information plays an important role in security prices and returns (see for example, Durnev et al. 2003; Ferreira and Laux, 2007). Part of the reason for this is that, on the whole, investors are not holding diversified portfolios that represent the market portfolio, and this would be necessary for the Capital Asset Pricing Model (CAPM) (Black, 1972; Lintner, 1965; Sharpe, 1964), to hold, and for markets to be strongly efficient (see for example, Campbell et al. 2001; Statman, 2004; Xu and Malkiel, 2003).

There are a number of reasons why investors do not, or are not able to hold a representative blend of the market portfolio. Some of these reasons are high transaction costs, limited funds for investing, or just simply wanting to invest mostly in a particular
stock (see for example, Campbell et al. 2001; Statman, 2004; Xu and Malkiel, 2003). In addition, if an investor was to go by the rules of mean-variance portfolio theory, then the optimal level of diversification would be in the hundreds, whereas, the average investor typically only holds a couple of stocks (see for example, Campbell et al. 2001; Statman, 2004; Xu and Malkiel, 2003).

In addition, fund managers will often structure their portfolios to contain a reasonable degree of idiosyncratic volatility for better average returns. Therefore, many large funds are not holding portfolios that represent the market portfolio either, and their portfolios are not mean variance efficient (see for example, Campbell et al. 2001; Malkiel and Xu, 1997; Statman, 2004; Xu and Malkiel, 2003). Goyal and Santa-Clara (2003) discuss that there are a number of asset pricing models in the literature that take idiosyncratic risk into account, whereby, for various reasons, investors are not able to, or do not wish to, hold a diversified portfolio. Therefore, much of the risk that is considered to be market risk has idiosyncratic characteristics, implying that idiosyncratic risk is priced in the market (see for example, Drew et al. 2004; Drew et al. 2005; Goyal and Santa-Clara, 2003; Guo and Savickas, 2008; Malkiel and Xu, 1997).

Angelidis (2010) found that developed and more efficient markets contain higher levels of idiosyncratic volatility relative to less efficient emerging markets. This would indicate that more efficient markets, with greater information flow and information-rich security prices, contain higher levels of idiosyncratic volatility. It follows then that an efficient capital market is one that contains higher levels of idiosyncratic volatility, or alternatively, higher idiosyncratic volatility creates a more efficient market. Therefore, developed, more efficient markets, with greater information flow and information-rich security prices contain higher levels of idiosyncratic volatility. Moreover, at various levels of market efficiency and availability of information, idiosyncratic risk is priced in the market, along with the market factor, and other risk factors (see, Drew et al. 2004; Drew et al. 2005). Hence, idiosyncratic risk is influential and relevant for market efficiency, asset price formation and security returns (see for example, Drew et al. 2004; Drew et al. 2005; Malkiel and Xu, 1997).

2.2.3. Idiosyncratic Risk and Behavioural Finance

Dimson, Marsh, and Staunton (2004) argue that investors are on the whole, surprisingly optimistic, considering the behaviour of markets and market history. Further, it is suggested that investor optimism is often somewhat irrational (see for example, Dimson et al. 2004; Shiller, 2000). Avgouleas (2009) points out that a number of weaknesses and shortcomings in financial regulation have come to the surface since the
recent global financial crisis. They argue that any measures to improve financial regulation may need to take behavioural factors into account to be fully effective. Avgouleas, (2009) suggest that there needs to be a thorough rethink and reformation of current models, with the lessons learned from the financial crisis and the findings of behavioural finance research taken into consideration (Avgouleas, 2009).

Market efficiency (see for example, Fama, 1965; Fama, 1998; Malkiel, 2005a) and asset pricing theory (see for example, Black, 1972; Lintner, 1965; Sharpe, 1964) are mainstays of neoclassical finance. However, there has been much debate over the years as to whether these theories fully apply when many investors are not rational (see for example, Naughton, 2002; Shefrin, 2001; Shefrin and Statman, 2000; Shiller, 2000), and when many investors bear substantial amounts of idiosyncratic risk (see for example, Campbell et al. 2001; Xu and Malkiel, 2003). Behavioural finance is one factor that can give some insight into why investors take on reasonable levels of idiosyncratic risk in their investment portfolios.

2.2.4. Idiosyncratic Risk in both Bull and Bear Markets

Bekaert, Hodrick and Zhang (2012) examined aggregate firm-specific volatility in a number of developed stock markets up to 2008. They reported that other than an occasional spike, there was no evidence that idiosyncratic volatility was on the increase. However, it appeared to be highly correlated across stock markets.

Schwert (1990) studied daily stock returns volatility around the stock market crash of 1987. It was reported that aggregate returns volatility was quite high during periods of market decline as expected. Yet some aspects of volatility were unexpected considering the behaviour of returns volatility in previous stock market crashes. Schwert (1990) observed that volatility spiked quite dramatically during and immediately following the crash, then returned to normal quicker than expected or predicted.

2.2.5. Idiosyncratic Risk and Growth

Typically high growth is not a long-term sustainable growth, but a temporary phenomenon associated with uncertainty and risk. Firms with high growth spurts and high but uncertain future growth potential are often firms that have a tendency to greater volatility of returns (see for example, Wei and Zhang, 2006). These types of firms are
often associated with growth oriented industries and potentially in volatile environments where they may experience distress risk, greater uncertainty about future growth and therefore greater returns volatility (see for example, Fama and French, 1992; Fama and French, 1998 and 2007; Pástor and Pietro, 2003).

The internal growth rate of a firm is a contributing factor to the level of risk unique to a particular firm. The literature highlights various aspects of a firm’s internal growth rate and factors impacting of the growth of a firm, such as the unavoidable uncertainty and risk associated with growth, (see for example, Garnsey, 1998; Penrose, 1995; Spender, 1996), and particularly high growth (see for example, Wei and Zhang, 2006).

2.2.6. Idiosyncratic Risk and Leverage

Links are found to exist between firm leverage, idiosyncratic uncertainty, and firm value and returns (see, Johnson, 2004). Johnson (2004) found that when a firm is highly levered, it is better for the firm’s stock price for there to be less information, and more ambiguous information in the market place regarding the firm’s cash flows. The degree of leverage that a firm bears is one of the contributing factors to the level of firm-specific risk unique to that firm. Leverage is considered necessary for the successful operation and running of a firm, and therefore for shareholder wealth maximisation. However, if not managed well, leverage can dramatically increase the riskiness of the firm, and therefore increase the cost of financing, and decrease shareholder wealth. In the case financial distress and bankruptcy, leverage can ultimately destroy the viability of the firm.

It is generally accepted that the higher the leverage (beyond an optimal/manageable point), the greater the risk of financial distress. There is an optimal capital structure with an optimal mix of debt and equity. However, beyond that optimal level, leverage has the overall effect of increasing the firm’s cost of financing and risk of financial distress (see for example, Pham et al. 2012). Therefore, one way to reduce levels of firm-specific risk for a firm is to reduce debt levels. However, a risk reduction strategy such as this is not necessarily in the best interests of the firm and its shareholders. It depends on the motives for the risk-reduction strategy and the unique characteristics of the firm (see for example, Anderson, Mansi, and Reeb, 2003; Anderson and Reeb, 2003).
2.2.7. Idiosyncratic Risk and Firm Size

It is documented in the literature that over the years relatively smaller firms typically produce better returns than do relatively larger firms (see for example, Fama and French, 1992, 1995; Gaunt, 2004; Halliwell, Heaney, and Sawicki, 1999; Malkiel and Xu, 1997). It is suggested that firm size is a useful risk proxy and is better able to explain the cross-section of expected returns than beta (see for example, Fama and French, 1992; Malkiel and Xu, 1997). Moreover, following a study of the relationship between idiosyncratic volatility and expected returns, Malkiel and Xu (1997) concluded that small size firms contain higher levels of idiosyncratic volatility, and the higher the level of idiosyncratic volatility the more superior the returns performance. Malkiel and Xu (1997) suggest that their findings shed more light on the dynamics of risk and return, while also offering an alternative explanation for the size effect put forward by Fama and French (1992).

Idiosyncratic volatility is found to be a good proxy for risk that is missed by the CAPM (see for example, Fama and French, 1992; Guo and Savickas, 2008; Malkiel and Xu, 1997). Dempsey (2002) suggests that both small firms and firms with high levels of idiosyncratic volatility perform well in terms of investment returns. However, it is typically the firms with the higher levels of idiosyncratic volatility that are the better performers in terms of returns to investors (see also, Dempsey, Veeraraghavan, and Drew 2001; Malkiel and Xu, 1997).

2.2.8. Idiosyncratic Risk and Liquidity

The degree of liquidity of a firm’s stock is an important firm-specific factor contributing to the level of idiosyncratic volatility inherent in that stock (see for example, Fernando, 2003). Spiegel and Wang (2005) found a negative relationship between idiosyncratic volatility and liquidity, suggesting that stocks with high levels of idiosyncratic volatility tend to be small capitalization firms with low liquidity. This is due in part to the higher transaction costs associated with low liquidity, in that small size firms with low liquidity will incur relatively higher transaction costs, compared to small firms with higher liquidity (see for example, Domowitz, Glen, and Madhavan, 2001).

The costs of liquidity are essentially transaction costs, and these costs include among others, the cost of the liquidity spread and compensation for execution costs. The loss of fundamental value is also a transaction cost. This is not being able to achieve the desired/required price when trading an illiquid asset or an asset in an illiquid market. Then,
there is the cost of a liquidity premium demanded on such an asset. In addition, the cost of the bid-ask spread and matching up buyers and sellers is also a transaction cost associated with liquidity (see for example, and related discussion, Bali et al. 2005; Chan and Faff, 2003; O’Hara, 2003). Hence, transaction costs will be higher in less liquid markets and/or for less liquid assets. Therefore, when a stock is less liquid, transaction costs will be higher and idiosyncratic volatility will be greater.

2.2.9. Diversification, Risk and Return

Over the years a number of asset pricing models (based on asset pricing theory) have been developed with the aim of replacing or making improvements to the CAPM (see for example, Goyal and Santa-Clara, 2003). For instance, Bornholt (2007) developed a reward beta approach (based on a more accurate mean-risk beta) with a better range of applications for predicting expected returns for a given level of risk.

As discussed earlier, total stock market investment risk is comprised of both systematic (market) risk and unsystematic (idiosyncratic) risk. Idiosyncratic risk is that component of total risk that is specific or unique to an individual firm. According to theory behind the CAPM (Black, 1972; Lintner, 1965; Sharpe, 1964), unsystematic risk can and should be diversified away, and an investor is only rewarded for bearing systematic risk. Conversely, an investor should not expect any reward for bearing unsystematic unnecessarily, or at least any more than is absolutely necessary for a given level of expected reward.

However, it is argued that systematic risk is not the only risk to be considered, even for a diversified portfolio of risky assets (see for example, Bekaert et al. 2012; Campbell et al. 2001; Dempsey, 2002; Naughton, 2002). Moreover, the idiosyncratic risk element of an investor’s portfolio can offer superior returns. Therefore, idiosyncratic risk should be recognised, along with market risk, for its impact on investment returns (see for example, Dempsey, 2002; Drew et al. 2004; Drew et al. 2005; Fu, 2009; Goyal and Santa-Clara, 2003 Malkiel and Xu, 1997; Xu and Malkiel, 2003). Furthermore, it is suggested that in the case of two portfolios that have similar betas, the portfolio containing the stocks with higher levels of idiosyncratic volatility will deliver the more superior returns (see, Dempsey, 2002; Dempsey et al. 2001).
2.2.10. Idiosyncratic Risk and Expected Returns: Some Conflicting Evidence

Malkiel and Xu (1997) reported at the time, that the overall market as a whole, had remained relatively stable since the stock market crash of 1987, while the firm-specific volatility had increased during that period. Malkiel and Xu (1997) put forward that their observations and findings show that idiosyncratic volatility is a good risk proxy, and therefore important for asset pricing and expected returns. Hence, idiosyncratic risk has been widely researched in the literature, and mixed results found. Some examples are discussed below.

Many researchers have found positive relationships between idiosyncratic volatility and expected returns (see for example, Fu, 2009; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997). However, Ang, Hodrick, Xing and Zhang, (2006) found that firms with high levels of idiosyncratic volatility produced very poor returns. Ang et al. (2006) offered some suggestions as to why other researcher’s results were different to their results, while other researchers made suggestions as to why the Ang et al. (2006) results produced a negative relationship between idiosyncratic risk and expected returns. For instance, Ang et al. (2006) comment that Malkiel and Xu (2002) did not report significance levels on some of their idiosyncratic volatility results, which casts some doubt on the findings. On the other hand, Malkiel and Xu (2004) suggest that the results of Ang et al. (2006) may be impacted by an “errors in variables” problem. All in all, Ang et al. (2006) suggest that the various conflicting findings present quite a puzzle.

In a bid to help solve this puzzle, Fu (2009) conducted an independent analysis and also replicated the Ang et al. (2006) study. Overall, they found a positive relationship between idiosyncratic volatility and expected returns. Fu (2009) argued that their findings and analyses show that the findings of Ang et al. (2006) were largely driven by the return reversals. Spiegel and Wang (2005) also found a positive relationship between idiosyncratic volatility and expected returns. However, they comment that even though their study produced different results, findings, and conclusions to Ang, Hodrick, Xing and Zhang (2005), both sets of results did not necessarily conflict, because each study used different data frequencies.

Goyal and Santa-Clara (2003) found a significant positive relationship between the value-weighted return on the market portfolio and average idiosyncratic volatility. They reported that average stock variance was better able to predict stock market returns than the market variance. However, Bali et al. (2005) disputed this result, and found no evidence of a link between returns on the market portfolio and average idiosyncratic volatility. They suggested that the Goyal and Santa-Clara (2003) findings were due to various factors.
including a small firm effect and a liquidity premium. In addition, Wei and Zhang (2005) suggested that the positive relationship between average idiosyncratic volatility and stock market returns found by Goyal and Santa-Clara (2003) was, in large part, a product of the data of the 1990s. Further, Guo and Savickas (2003) found that idiosyncratic volatility was actually negatively correlated with stock market returns, when the Goyal and Santa-Clara (2003) measures of average idiosyncratic volatility were used.

Bali and Cakici (2008) point out that there are many factors impacting on the study of a relationship between idiosyncratic volatility and expected returns. These include issues to do with data frequency, weighting schemes, breakpoints, and exclusions. Hence, these factors help to explain some of the conflicting evidence on the relationship between idiosyncratic risk and expected returns (see also, for example, Brandt et al. 2010).

2.2.11. Idiosyncratic Risk, and Firm Performance, Value and Returns

Although results are mixed in the literature, the majority of studies on idiosyncratic risk find significant relationships between idiosyncratic volatility and expected returns, firm value, and performance. Most find positive relationships and some report negative relationships (see for example, Bali and Cakici, 2006; Fu, 2009; Goyal and Santa-Clara, 2003; Lu, 2006; Malkiel and Xu, 1997; Miller et al. 2002; Spiegel and Wang, 2005; Xu and Malkiel, 2003). A selection of influential studies is briefly discussed below, along with the findings.

According to the Capital Asset Pricing Model (Black, 1972; Lintner, 1965; Sharpe, 1964) unsystematic risk is diversifiable risk and therefore does not deserve a risk premium. Hence, only systematic risk deserves a risk premium, and is priced in the market. However, Fama and French (1992) challenged CAPM theory and found that beta (a measure of systematic risk) possessed very little forecasting power with regard to expected returns, while other variables, such as firm size were able to better explain stock returns. Malkiel and Xu (1997) replicated the Fama and French (1992) study in analysing the relationship between beta and expected returns. They confirmed the findings of Fama and French (1992), that there was little of no relationship between beta and expected returns. Further, portfolios containing moderate beta stocks performed just as well as portfolios with high beta stocks. Malkiel and Xu (1997) also confirmed the findings of Fama and French (1992) that relatively small size firms performed better than relatively large firms.

Malkiel and Xu (1997) examined the relationship between idiosyncratic volatility and expected returns, controlling for size. They reported a strong positive relationship
between idiosyncratic volatility and expected returns, and a strong negative correlation between idiosyncratic volatility and firm size. Malkiel and Xu (1997) put forward that their findings offered an alternative explanation for the strong correlation between firm size and expected returns found by Fama and French (1992). Malkiel and Xu (1997) concluded that firm size, idiosyncratic volatility, and expected returns are strongly related. In that firm size and idiosyncratic risk are negatively correlated, as is firm size and expected returns, while idiosyncratic volatility and expected returns are positively correlated. Therefore, the smaller the firm, the greater the degree of idiosyncratic volatility, and the greater the expected returns.

In addition, in their analysis of stocks in the S & P 500, Malkiel and Xu (1997) noted that while there had been no increase in overall market volatility as a whole, there was clear evidence of increased volatility in individual stocks. They conducted an analysis to test for correlations between stocks and found there to be a decline in the mean correlation coefficients from 1970 through to the mid 1990s.

Campbell, et al. (2001) studied the volatility of common stocks at the market, industry, and firm levels, from 1962 to 1997. They also found there to be a noticeable increase in firm-specific volatility relative to market volatility. They also reported that correlations among individual stocks had declined, as had the explanatory power of the market model for average stock returns. Further, the number of stocks needed to achieve a given level of diversification had increased. Campbell et al. (2001) put forward that these findings have an impact on diversification and investment strategies, on arbitrage trading strategies, on option pricing, and on the overall economy.

Goyal and Santa-Clara (2003) studied the time-series relationship between the value-weighted return on the market portfolio and average stock variance which is largely idiosyncratic. They found there to be a significant positive relationship between average idiosyncratic variance and return on the market portfolio, while the variance of the market had no predicting power for stock market returns. Goyal and Santa-Clara (2003) suggest that their results indicate a link between idiosyncratic risk and stock market returns.

Ang et al. (2006) examined the cross-sectional relationship between idiosyncratic risk and expected returns for US stocks, and whether or not, aggregate market volatility is a priced risk factor in the US market. As a result of their cross-sectional analysis of the relationship between idiosyncratic volatility and expected returns, Ang et al. (2006) reported that idiosyncratic volatility and expected returns were negatively correlated, and that portfolios containing stocks with high idiosyncratic volatility produced very low average returns. Ang et al. (2006) point out that this result is robust after controlling for
size and other factors, and is consistent under bear market conditions and also under bullish conditions. They concluded that idiosyncratic volatility is negatively priced in the market. In a further study, Ang et al. (2009) looked at international evidence as well as further US evidence. They still came up with the same result of a negative correlation between idiosyncratic volatility and expected returns. They also noted in their analysis that low returns to high idiosyncratic volatility stocks appeared simultaneously in different regions around the world, possibly indicating a global phenomena. Ang et al. (2009) comment that their findings combined with other conflicting findings are still puzzling.

Fu (2009) agreed that the Ang et al. (2006) findings did present quite a puzzle, yet at the same time it opened up a couple of important questions. These questions were concerned with the implications of the Ang et al. (2006) findings, the true relationship between idiosyncratic volatility and expected returns, and finally the how and why of Ang et al. (2006) results. Fu (2009) examined the cross-sectional relationship between expected returns and conditional idiosyncratic volatility. Then the Ang et al. (2006) study was replicated with the aim of analysing the results and explaining findings. Fu (2009) found a significantly positive relationship between idiosyncratic volatility and expected returns, in that they found a significantly positive cross-sectional relationship between conditional idiosyncratic volatility and average stock returns, and a significantly positive time-series relationship between expected idiosyncratic volatility and expected returns. The Ang et al. (2006) study was replicated again, but this time by closely following the methods, and then offering an empirical explanation for the findings. Fu (2009) suggest that evidence indicates that the findings of Ang et al. (2006) were mostly the product of monthly return reversals with high idiosyncratic volatilities. Hence, in the following month, the returns of stocks with high idiosyncratic volatility present as abnormally low.

Angelidis (2010) studied the behaviour and forecasting ability of idiosyncratic volatility in 24 emerging markets. The study investigated whether there is a relationship between average idiosyncratic risk and expected returns in these markets, whether average idiosyncratic volatility increases over time, and what the implications of idiosyncratic risk are for portfolio management. Angelidis (2010) found that idiosyncratic risk is relatively lower in emerging markets compared to developed, more efficient markets. Further, there was no evidence of any trends in idiosyncratic volatility, or market volatility, or average correlations between stock returns. Angelidis (2010) put forward that their findings provide evidence counteracting the notion of a global rise in idiosyncratic risk. Thus, reports of an increase in idiosyncratic volatility and a decrease in average stock correlations, is more likely to be period, market and sample specific, and is neither
persistent nor wide-spread. In addition, Angelidis (2010) found that idiosyncratic risk has predictive powers for expected returns when used in conjunction with market risk.

2.2.11.1. Connection between Firm Performance, Value, and Returns

Studies of firm performance typically look at the performance of a firm from different angles using different models and performance measures to those used in studies of performance in terms of investment returns to shareholders. However, these aspects of performance are fundamentally and empirically linked (see for example, Bauer, Guenster, and Otten, 2004; Donaldson and Davis, 1991; Gompers et al. 2003; Klein, 1998; Yermack, 1996). This is because investment returns and financial and accounting measures of performance are all to do with measures of how well the firm is performing, and how well it is using its financial resources from the point of view of the firm’s equity holders. These measures of performance include, among others, return on equity (ROE), return on assets (ROA), earnings per share (EPS), return on investment (ROI), stock price, and the market based measure of Tobin’s Q (see, for example, the related discussion in Bauer, et al. 2004; Donaldson and Davis, 1991; Gompers et al. 2003; Klein, 1998; Yermack, 1996).

Shareholders are concerned about how well the firm is performing financially because they are the residual owners and therefore the residual claimants of the firm’s profits. If a firm was to become insolvent then the firm’s shareholders would be last in line to realise returns on their investments. That is if there are any funds left after all other claimants on the firm have been paid out (see for example, the related discussion in Bauer et al. 2004; Donaldson and Davis, 1991). Hence, a firm needs to be performing well financially to produce long-term superior investment returns in the form of capital appreciation and/or dividends (see for example, Huang et al. 2011; Miller et al. 2002).
2.3. Corporate Governance - Theory, Evidence, and Background Discussion

This section briefly covers relevant theoretical models and concepts of corporate governance. Then it reviews the basic model of the corporation and how corporate governance works in principle. The dynamics of board structure and composition in relation to corporate governance is reviewed, along with issues to do with the various types of ownership structure in relation to corporate governance. This section also looks at corporate governance and firm performance, corporate governance and the global financial crisis, and various aspects of corporate governance in Australia.

2.3.1. Theoretical Models and Concepts

The various concepts and theories that underpin corporate governance are described and modelled in a number of ways, and many overlap. The main theories and models of relevance to the current study include the finance model and agency theory, transaction costs economics, the stewardship model, the trusteeship model, and the stakeholder model. These are briefly described below.

2.3.1.1. The Finance Model

The finance model holds that corporations are owned by the shareholders, and that maximising the value of the firm is the same as maximising shareholder wealth. According to implications of the model, this should be the primary goal of the firm. The finance model implies that management should put the interests of the firm’s shareholders first and foremost at all times (see, Blair, 1995; Shleifer and Vishny, 1997). Unfortunately, managers cannot always be trusted to do the right thing and putting the interests of shareholders first is not necessarily automatic for them, at least without some form of incentive (see, Jensen, 1994; Jensen and Meckling, 1994).

Due to dispersed equity ownership, it is impossible for shareholders to keep a constant eye on management so as to make sure that they act responsibly and ethically, and are fulfilling their duties (see, Berle and Means, 1932; Blair, 1995; Shleifer and Vishny, 1997). Hence, the finance model is concerned with the various problems and costs associated with the separation of ownership and control typical of the Anglo-US corporate form and with the need to make managers more responsible and focused on the best interests of the shareholders at all times. This is done through various mechanisms
including, incentives, and rules and contracts so that shareholder wealth is protected and maximised, and agency problems and costs reduced (see, Blair, 1995; Jensen 1994; Jensen and Meckling, 1994; Shleifer and Vishny, 1997).

**2.3.1.2. Agency Theory**

The principal-agent relationship is essentially a separation of ownership and control, between the principal (shareholders/owners) and the agent (management). This potentially problematic relationship exists when an agent is appointed to act on behalf of the principle (Jensen and Meckling, 1976; Ross, 1973).

Agency theory is born out of the finance model. Agency theory is a relationship based theory (see, Rajan and Zingales, 1998), and the separation of ownership and control of the agency relationship is an essentially fundamental, yet problematic feature of the corporate form of organisation and corporate governance. Hence, agency theory is concerned with the conflicts of interest that inevitably arise between the shareholders/owners of a firm, (the principals), and the CEO/management of the firm (the agents) due to this separation of ownership and control (see, Fama and Jensen, 1983a; Fama and Jensen, 1983b; Jensen and Meckling, 1976; Ross, 1973). Agency problems could stem from many factors including pet projects, information asymmetries, and bounded rationality (see, Jensen 1994; Jensen and Meckling, 1994; Learmount, 2002). Therefore, corporate governance systems are put in place to deal with agency problems and for the protection of shareholders rights and interests (see, Claessens, Djankov, and Pohl, 1997; Shleifer and Vishny, 1997).

**Agency problem**

As discussed above, agency problems can arise from agency relationships between principals and agents, due to the separation of ownership and control that exists in corporations when inadequate or inappropriate governance measures are in place (see, Claessens et al. 1997; Shleifer and Vishny, 1997). Agency problems can arise as a result of opportunistic and self-serving managers taking advantage of weaknesses or slackness in a system to maximise their own wealth, security, and position at the expense of the firm and its shareholders. For instance, CEO compensation is found to be excessive when corporate governance is weak (see, Core, Holthausen, and Larcker, 1999). Further, due to the unavoidable agency relationship in corporations, managers have a degree of autonomy and ample opportunities to act carelessly and to waste company resources if they are
inclined to do so (see for example, Fama and Jensen, 1983a; Jensen and Meckling, 1994; Shleifer and Vishny, 1997).

Therefore, agency problem is a serious problem for corporations that must be addressed and controlled. The fundamental aim of corporate governance is to ensure that managers put the interests of the firm and its shareholders before their own, and to help ensure that all financial stakeholders get a return on their financial investments (see, Fama and Jensen, 1983a; Fama and Jensen, 1983b; Jensen and Meckling, 1994; Shleifer and Vishny, 1997). In order to achieve this aim, organisations must have appropriate policies, procedures, contracts and incentives in place to mitigate agency problems. The resultant costs of establishing and maintaining these mechanisms are agency costs (see, Fama and Jensen, 1983a; Fama and Jensen, 1983b; Jensen and Meckling, 1976; Ross, 1973; Shleifer and Vishny, 1997).

**Agency costs**

Agency costs are the costs that firms must bear in the establishment and maintenance of mechanisms, policies and procedures to minimise and control agency problems and associated costs. So, a firm must incur agency costs to reduce agency costs. Good corporate governance policies and practices need to be in place to effectively deal with these problems, conflicts and costs, while at the same time making sure that the costs of eliminating or reducing agency problems are kept to a minimum. The design and implementation of corporate governance policies and practices must be responsibly managed to conserve the firm’s scarce resources and to maximise shareholder wealth (see for example, Fama and Jensen, 1983a; Fama and Jensen, 1983b; Jensen and Meckling, 1976; Ross, 1976; Shleifer and Vishny, 1997).

There are a number of theories and suggestions in the literature to deal with agency problems and to facilitate the alignment of management and shareholder interests, (see for example, Agrawal and Knoeber, 1996; Ang, Cole, and Lin, 2000; Jensen, Solberg, and Zorn, 1992). Firms with weak corporate governance will typically have greater agency problems, higher agency costs, and poorer performance relative to firms with good corporate governance systems and structures in place (see for example, Core et al. 1999; Giroud and Mueller, 2011).

**2.3.1.3. Transaction Costs Economics**

Transaction costs economics is focused on firm-level transaction costs, and the cost-effectiveness of organisations in keeping costs to a minimum. The theory behind the
model is to envisage the firm as a cost-effective, yet profitable organization, and to analyse the firm in great detail to highlight and gauge how the firm is going in terms of minimising the costs of its transactions (see, Riordan and Williamson, 1985; Williamson, 1987, 1991; Williamson and Masten, 1995). According to implications of the model, the ultimate aim of all activities of the firm is to maximise the net value of the firm. Therefore, an efficient organisation is one that maximises the value of the firm, that conducts and manages its transactions fairly and efficiently, and that minimises the costs of those transactions (see, Coase, 1937).

**Transaction costs**

Transaction costs encompass the costs involved in various forms and levels of business negotiations, including the costs involved in searching and collecting necessary information for quality decision making, and the costs of developing and enforcing corporate governance policies and mechanisms (see, Dahlman, 1979). Specific transaction costs for a firm may include the costs of writing contracts, supervising workers, and resolving disputes (see, Coase, 1937). In addition, agency costs incurred in the process of mitigating and controlling agency problems are essentially transaction costs. Therefore, agency problem stemming from the principle-agent relationship generates its own set of transaction costs in the form of agency costs (see for example, Fama and Jensen, 1983a; Fama and Jensen, 1983b; Shleifer and Vishny, 1997).

**2.3.1.4. The Stewardship Model**

The theory behind the stewardship model is that firm performance and value will be maximised when managers are empowered with trust, authority and responsibility, and have a shared vision for the firm’s success (see for example, Davis, Schoorman, and Donaldson, 1997; Donaldson and Davis, 1991; Haniffa and Cooke, 2002; Keasey and Wright, 1997). The implications of the stewardship model suggest that on the whole, managers are basically good stewards and are motivated by a sense of responsibility and achievement. Therefore, according to this model managers are more likely to focus on the goals of the firm rather than their own personal goals, when their motivations are based on trust and a sense of achievement (see for example, Davis, Schoorman, and Donaldson, 1997; Donaldson and Davis, 1991; Haniffa and Cooke, 2002; Keasey and Wright, 1997). Good corporate governance fosters stewardship, and finds an appropriate balance between control and motivation (Keasey and Wright, 1997).
2.3.1.5. The Trusteeship Model

According to the theory behind the trusteeship model, the board of directors acts as a trustee of the firm and its assets. The model implies that both financial and non-financial stakeholders are important to the firm. Therefore, the board should focus on the needs and interests of both of these groups, rather than focusing entirely on the shareholders. In addition, although some form of monitoring is still necessary, the trusteeship model implies that managers will normally act out of a sense of duty and in the best interests of the firm and the stakeholders (see, Kay and Silberston, 1995).

2.3.1.6. The Stakeholder Model

Similar to the trusteeship model, the stakeholder model also implies that an organisation needs to consider the interests of all stakeholders, both financial and non-financial. Moreover, the firm should be socially responsible and concerned with the welfare of the environment and the wider the community (see for example, Freeman, Wicks, and Parmar, 2004; Harrison and Freeman, 1999). According to this model, if an organisation is committed to serving all stakeholders then it will make sure that there is diversity amongst executives and management to better represent the organisation and to be relevant to the wider community (see for example, Freeman, Wicks, and Parmar, 2004; Harrison and Freeman, 1999). In addition, to ensure board independence and to allow for some stakeholder representation, there should a percentage of independent directors on the board (see, Buchholz and Rosenthal, 2004 and 2005).

2.3.2. The Anglo-US Corporate Form and Model of Corporate Governance

The main form of corporate governance in common law countries, such as Australia, is the market-based Anglo-US model (see, La Porta, de Silanes, Shleifer, and Vishny, 1998). This model of corporate governance is fundamentally concerned with agency theory and the principle-agent relationship (see, La Porta et al. 1998). The principle-agent relationship creates an environment for potential conflicts of interest and uncertainty for shareholders (see, Shleifer and Vishny, 1997). To help reduce conflicts of interest and uncertainty for shareholders, corporate governance systems need to be in place and functioning effectively. Typically, for the Anglo-US form of corporation, these systems include both internal governance controls and external market based controls (see for example, and related discussion, Blair 1995; Shleifer and Vishny, 1997; Walsh and Seward, 1990).
From a corporate finance perspective, the main participants in a corporate governance system are the board of directors, management, the shareholders and other financial stakeholders (see for example, Blair, 1995; Leeson et al. 2010). Corporations raise capital through borrowing and issuing securities. Shareholders have a residual claim on the firm in that they are paid out only after creditors and all other financial stakeholders have been paid. If the company has performed well, profits will be distributed to the shareholders in the form of reinvestment and/or cash dividends. On the other hand, shareholders may receive very little if the company has performed poorly.

Therefore, the Anglo-US form of corporation is built around a company’s need to raise capital and investors need to invest their funds for financial gain, and for those funds to be professionally and appropriately managed by the firm’s financial management (see, Shleifer and Vishny, 1997). Hence, due to this handover of control, shareholders can no longer be absolutely certain that they will receive the best possible returns on their investments. This uncertainty that investors face is at the fundamental core of agency theory (see, Shleifer and Vishny, 1997).

2.3.3. Principles for Good Corporate Governance and the Board of Directors

The interface between the owners of a firm and its management is the board of directors. The board of directors plays a vital role in the governance of an organisation and is an important aspect of internal governance control. The board’s role encompasses direction and goal setting, interaction with the firm’s owners and the CEO, monitoring the actions of managers, relationship maintenance, and the protection of shareholders’ interests (see for example, Coles, Daniel, and Naveen, 2008; Cotter and Silvester, 2003; Hermalin and Weisbach, 1988). The board of directors are there to assist and advise management, and to block any management decisions that would be detrimental to the company and shareholder wealth (see for example, Charkham, 1995; Kose and Senbet, 1998; Monks, 2001).

Under Australian Corporations Law and Common Law, the board of directors and each individual director are bound by a fiduciary relationship with the corporation they serve. Therefore, directors must act in the best interests of the company and its shareholders at all times (see, Lesson et al. 2010). There are a number of issues that directors must adhere to, and be mindful of, including among others, the need to be open and honest regarding any personal interests that may conflict with their discharge of duties, and avoid conflicts of interest at all times. Directors must keep up to date with company
financial statements, matters of concern, and any other necessary information required for decision making. At the same time directors must act appropriately at all times, and not misuse company information for their own benefit. Directors must keep up to date with competencies and requirements, and in particular, fulfil annual Australian Securities and Investment Commission (ASIC) requirements. In addition, directors must ensure that the company’s debt obligations are met and that the company does not trade while insolvent (see, Leeson et al. 2010).

The Hampel Committee (1998) sets out some fundamental principles for good corporate governance with regard to the board of directors. These principles cover issues including the need to provide leadership, direction and control for the company, and the need to maintain a workable balance of executive, non-executive, and non-executive independent directors so that board decision making is objective. In addition, the report points out that it is important for the board of directors to be kept fully informed with understandable, accurate, comprehensive, timely and appropriate information. This will then facilitate quality decision making and the effective discharge of their duties (Hampel Committee, 1998).

Corporate governance research has also been influenced by the Cadbury report since it was published in 1992. The Cadbury Committee published a ‘Code of Best Practice’ which contained a number of significant recommendations including issues to do with board independence, and the need for at least three non-executive directors on a board so that they can have an appropriate level of influence at board meetings (Cadbury, 1992). The report also suggests that shareholders also have a role to play since they elect the board directors (Cadbury, 1992).

Shleifer and Vishny (1997) point out that even though the shareholders elect the board of directors, there is no guarantee that directors will act in their best interests at all times (see also, Jensen 1994). Further, due to dispersed equity ownership, it is impossible for shareholders to keep a constant eye on directors and management (see for example, Berle and Means, 1932; Jensen 1994; Jensen and Meckling, 1994; Shleifer and Vishny, 1997). Notwithstanding these issues, as a set of principles and relationships that ultimately determines the direction and performance of a firm – the role, function, and responsibilities of the board of directors are primary factors in corporate governance, and crucial to the governance process (Leeson et al. 2010).
2.3.4. Board Structure and Composition

Board structure is an important element of corporate governance and the board of directors are integral to internal governance control. The structure and composition of the board of directors impacts on many areas of an organisation, including decision making, recruitment and remuneration, risk aversion, investment and return, and the overall direction of the company. Various aspects of board structure and composition are discussed below.

2.3.4.1. Board Independence

A corporate board consists of both executive and non-executive directors. Executive directors are fulltime employees hence they are familiar with the running of the company. Therefore, executive directors are in a position to exert influence over the direction, financial affairs, and performance of the company. On the other hand, non-executive directors are not full-time employees, and therefore considered to be independent (see, Pass, 2004). Although roles may vary and overlap in different settings, executive directors are typically involved in goal setting and strategic direction, while non-executive directors are typically involved in chairing committees, and monitoring executive actions and decision making (see, Pass, 2004). Further, the presence of non-executive directors can provide a degree of impartiality to the relationship between executive directors and shareholders. This allows for more independent and unbiased decisions on important issues concerning the company and its shareholders (see, Chen and Jaggi, 2001; Lesson, et al. 2010; Pass, 2004). Research has found that including a greater number of independent directors on a corporate board leads to better corporate governance (see for example, Pass, 2004; Young, 2000).

There has been some discussion over the years regarding the true independence of non-executive directors. For instance, executive directors may have a degree of input and responsibility in the appointment process of non-executive directors. This could lead to conflicts of interest and loyalty issues for the non-executive appointee at some stage during their time with the company (see, Pass, 2004). Other factors that could affect director independence include, the length of tenure of the non-executive director on the same board (see, O'Sullivan and Wong, 1999), a non-executive director that is a retired executive director of the company (see, Weir and Laing, 2001), or a non-executive director involved in transactions with the company (see, Clifford and Evans, 1997). Therefore, many non-executive directors who appear to be independent would actually be better classified as
grey directors (see, Clifford and Evans, 1997). The ASX Corporate Governance Principles and Recommendations recommend that individual directors disclose any information regarding affiliations that could potentially affect their independence (ASX, 2012).

A number of studies of board structure and firm performance have found no convincing evidence that including a greater number of independent directors on the board improves board effectiveness and firm performance (see for example, Bhagat and Bernard, 2002; Hermelin and Weisbach, 1991). For instance, it is suggested that, at times, corporate boards can be quite careless in the discharge of their duties even when there are independent directors on the board (see for example, Franks, Mayer, and Renneboog, 2001; Mórck, 2008). Moreover, depending on the structure of the board, independent directors may have very little impact on board decision making and actions, particularly where there is a powerful CEO/director chairing the board (see for example, Adams, Almeida, and Ferreira, 2005).

However, it is widely considered that the inclusion of independent directors on a board is conducive to good corporate governance (see for example, Black and Kim, 2012; Bois et al. 2009; Coles et al. 2008; Uzun, Szewczyk, and Varma, 2004). There are a number of studies that report positive relationships between the proportion of independent directors on a board and firm performance (see for example, Bois et al. 2009; Coles et al. 2008; Fazlzadeh et al. 2011). Linck, Netter and Yang (2008) studied determinants of board structure, and compared board structure across small and large firms. They found obvious and important differences between small and large firms, indicating that there is an optimal board structure for a firm, and that firms choose board size and structure based on the costs and benefits to the firm. Bebchuk and Weisbach (2010) suggest that director independence is an increasingly important element of good corporate governance that needs further research and analysis for its impact on corporations.

2.3.4.2. Board diversity

Board diversity is the diversity of attributes, backgrounds, and characteristics of the board members. Individual directors on a corporate board may differ in many ways, including degrees of education, industry experience, race and gender (see for example, Coffey and Wang, 1998; Ferreira, 2010). Ferreira (2010) suggests that board diversity may convey positive signals to employees, other stakeholders, and the wider community regarding the firm’s commitment to equitable and fair dealings with minority groups. Kang, Cheng and Gray (2007) suggest that board diversity, and in particular gender
diversity, are important aspects of corporate governance and are timely and topical issues that require further research.

**Gender diversity**

Kang *et al.* (2007) reported that there was very limited gender diversity on the Australian boards in their study. For instance, boards were typically comprised of around 9 directors, and the chairman of the board was typically male. The typical director was male, aged 50-70, and independent.

Some of the positive impacts of gender diversity include more effective monitoring and greater commitment to board attendance and other duties (Adams and Ferreira, 2009a). It is suggested that gender diversity can provide a fresh outlook and different approach to decision making (see for example, Adams and Ferreira, 2009a; Erhardt, Werbel, and Shrader, 2003; van der Walt and Ingley, 2003). However, although there are a number of positive aspects to gender diversity, there are negative aspects as well. Adams and Ferreira (2009a) found on average, that there was a negative relationship between firm performance and gender diversity. They found that including additional women on a corporate board to fill a gender quota has a negative impact on firm performance, particularly if the board is already functioning efficiently.

Levi, Li and Zhang (2013) highlight some of the differences between men and women in terms of male and female directors. They discuss that on the whole, both male and female directors are relatively confident. However, male directors tend to be more confident, leaning to the overconfident side, whereas female directors tend to be more on the side of caution. In addition, male and female directors are often different in the way that they structure decision making and foresee outcomes (see for example, Barber and Odean, 2001; Burke, 2003; Levi *et al.* 2013). There are calls for further research to be conducted on this important area of board diversity in relation to corporate governance and firm performance (see for example, Burke, 2003; Kang *et al.* 2007).

**2.3.4.3. Other Corporate Affiliations of the Board Members/Board Busyness**

The ASX Corporate Governance Principles and Recommendations recommend that directors should be mindful of the time constraints, workloads, commitments and responsibilities required of them with multiple directorships. This is because directors need to be able to adequately fulfil their current duties and responsibilities, as well as the other duties required of them with additional directorships. Further, in the case of election
for directorship, directors must disclose all relevant information regarding their current
directorships (ASX, 2012).

Haniffa and Hudaib (2006) argue that company boards with members that are busy
with multiple directorships tend to have a negative impact on firm value. They suggest that
this is due in part to the impact of market perception on firm value, in that the market
perceives that busy directors do not have enough time to fulfil all of their duties (Haniffa
and Hudaib, 2006). It is suggested that a director is considered to be busy if he or she
holds three or more directorships and the number is six or more if retired (Core et al.
1999). When outside directors are too busy, governance is weaker and agency problems
and costs increase. This can impact negatively on firm value and performance (see, Core et
al. 1999).

On the other hand, it is suggested that background experience and outside
corporate affiliations can provide a positive signalling effect for the firm, with regard to the
level of experience and expertise on the board (see for example, Higgins and Gulati, 2003;
Kim and Higgins, 2007). Corporate affiliations can also give top executives a rapport with
counterparts that can enhance a firm’s ability to develop associations, gain access to
valuable information and resources, and to win profitable contracts (see for example, and
related discussion, Higgins and Gulati, 2003; Kiel and Nicholson, 2006; Kim and Higgins,
2007).

2.3.4.4. Board Size

Anderson, Mansi, and Reeb (2004) found that the cost of debt is lower for firms
with larger size boards. They suggest that this may be because creditors believe that a
larger board equates to better monitoring. However, it is suggested that even though a
bigger board can offer better monitoring, communication may be poorer (see, Jensen, 1993;
Lipton and Lorsch, 1992), and hence information flow restricted.

Evidence on board size and firm performance is mixed. Some studies have found a
negative relationship between board size and firm performance (see for example, Coles et
al. 2008; Guest, 2009; Hermalin and Weisbach, 1991 and 2001; Jegers, 2009; Mak and
Kusnadi, 2005; Shah and Butt, 2009; Yermack, 1996), while others report a positive
association between board size and firm value and performance (see for example, Adams
and Mehran, 2012; Anderson et al. 2004; Belkhir, 2009; Kiel and Nicholson, 2003; Li and
boards tend to be relatively small compared to boards in the US. Nevertheless, they found
a positive relationship between board size and firm value for Australian firms. As discussed earlier, there is an optimal board size and structure for a firm and firms will typically choose board structure based on the costs and benefits to the firm (see, Linck, et al. 2008).

2.3.5. Ownership Structure

Ownership structure is an important element of corporate governance for an organisation and is a key aspect of internal governance control. The ownership structure of a company is a major determinant of the balance of power within the company. Various aspects of ownership structure are discussed below.

2.3.5.1. Insider Ownership

Management Ownership

In general, it is found that inside ownership typically improves firm performance (see for example, Agrawal and Knoeber, 1996; Ang et al. 2000; Ho, 2005; Lichtenberg and Pushner, 1994; Móck, Shleifer, and Vishny, 1988). However, this depends on a number of factors including, the type of firm, the unique characteristics and situation of the firm, the type of insider ownership, and the size of the holdings (see for example, McConnell and Servaes, 1990; Móck et al. 1988). For instance, management often have overly large equity holdings, and become entrenched, impacting negatively on firm performance (see for example, McConnell and Servaes, 1990; McConnell and Servaes, 1995; Móck et al. 1988). One reason for this is that large owner managers will try to protect their personal financial positions by reducing risk exposure. Hence, they will tend to focus on less risky projects and strategies which may not always be in the best interests of the other shareholders (see, Tufano, 1996).

However, a study of UK firms by Hillier and McColgan, 2008 found that firms with entrenched managers performed well even though some holdings were over 50% of total equity holdings. It is suggested that the agency problems and costs associated with large entrenched insiders are often offset by the benefits associated with the alignment of management and shareholders’ interests that is a feature of this type of ownership (see, Hillier and McColgan, 2008; Short and Keasey, 1999). Móck et al. (1988) found that firm performance typically improves with increased management ownership, largely due to do alignment of management and shareholder interests. However, they found that the positive
impacts of insider ownership begin to dissipate as management become more and more entrenched and voting control becomes stronger.

**Family Ownership**

Family ownership is found to impact positively on firm performance. Further, it is suggested that as an organisational structure, family ownership can be quite effective, particularly when the CEO is a family member (see for example, Anderson et al. 2003; Anderson and Reeb, 2003; Martínez, Stöhr, and Quiroga, 2007; Miller and Le Breton-Miller, 2006). At the same time, it is recognised that concentrated family ownership has the power to ensure their own financial positions and interests are secure. They do this by influencing and constraining the firm in areas such as investment choice and debt levels in a bid to reduce their personal exposure to risk (see for example, Anderson et al. 2003; Anderson and Reeb, 2003).

Family owned firms may lose market value if the market perceives that the firm has governance problems, and hence is too risky (see, Claessens and Fan, 2002). Problems associated with family ownership include, entrenchment (see for example, Claessens, Djankov, Fan and Lang, 2002; Mórck and Young, 2004), and issues to do with succession planning (see for example, Cucculelli and Micucci, 2008; Smith and Amoako-Adu, 1999). For instance, Smith and Amoako-Adu (1999) found in a study of family controlled Canadian firms that firms lost value almost immediately following the appointment of a family successor. In addition, it is argued that very large, powerful and disproportionate family ownership can not only impact negatively on the firm, but can also impact negatively on the economy of a country (see, Mórck et al. 2005).

**2.3.5.2. Institutional Ownership**

Institutional ownership resembles a well-diversified blockholder, whereas family ownership resembles a long-term, undiversified, and risk adverse blockholder (see, Anderson et al. 2003; Anderson and Reeb, 2003). Institutional ownership is found to impact on both corporate governance and firm performance because institutional ownership promotes greater board vigilance (see, Ho, 2005; Short and Keasey, 2005). However it depends on the type of institutional investor as to the impact on the firm (see, Lehmann and Weigand, 2000). Agrawal and Mandelker (1990) suggest that institutional block ownership leads to better monitoring of management. However, they found no significant relationship between institutional ownership and firm performance. Bushee, Carter and
Gerakos (2009) reported weak evidence of a link between institutional equity ownership and better corporate governance.

In addition, there is found to be a clientele effect in some markets whereby institutional investors make their investment choice according to a particular firm’s existing governance policies and practices. When the institutional investor becomes an influential part of the firm’s ownership structure, they proactively help the firm to improve their corporate governance practices even further (see for example, Ackert and Athanassakos, 2001; Bushee et al. 2009; Bushee and Noe, 2000; Hartzell and Starks, 2003). However, Stapledon, (2011) observed that institutional investors are not as proactive in corporate governance matters in Australia, as they are in other markets such as the US.

2.3.5.3. Ownership Concentration

Ownership concentration is reported to be common around the world (see, Claessens et al. 2002; Claessens and Fan, 2002; La Porta, López de Silanes, and Shleifer, 1999). Shleifer and Vishny, (1997) suggest that concentrated equity ownership can mitigate agency problems and provide greater protection for shareholders. This is because very large shareholders will have enough control over the firm for both their own interests and the interests of the other shareholders to be upheld. However, blockholdings are sometimes disproportionately large and very controlling. This is often achieved through pyramid structures and cross-holdings (see, Claessens et al. 2002; Claessens and Fan, 2002; Dennis and McConnell, 2003; La Porta et al. 1999).

Research has found positive relationships between concentrated equity ownership and firm value and performance (see for example, Gorton and Schmid, 2000; Mörck et al. 1988; Sarkar and Sarkar, 2003; Thomsen and Pedersen, 2000). However, when ownership and control become too great the positive effects of concentrated equity ownership are reduced (see, Mörck et al. 1988; Thomsen and Pedersen, 2000). It is suggested that ownership and control is complicated, and it is not necessarily the case that greater ownership and control leads to a reduction in conflicts of interest, better corporate governance, and better firm performance. This is due to the impact of powerful controlling shareholders and how they choose to use their control (see, Denis and McConnell, 2003). Blockholders have the impetus to monitor management actions and decision making, and to impact on outcomes (Denis and McConnell, 2003). However, the influence of blockholders is not always in the best interests of the other shareholders (Denis and
McConnell, 2003). It depends largely on the size, type and identity of the blockholder, as to whether or not there are positive effects on the firm (see for example, Claessens and Djankov, 1999; Denis and McConnell, 2003; Sarkar and Sarkar, 2003; Thomsen and Pedersen, 2000).

Lamba and Stapledon (2001) suggest that blockholders will often choose a firm according to the benefits available to them as large equity holders. They observed that Australia firms have substantial blockholdings. However, they suggest that it likely that these firms are better performers than diffusely held firms. Therefore, although the presence of powerful blockholders can be problematic, it may well be offset by the shared benefits blockholders can bring to a firm. These benefits include better monitoring, enhanced protection of minority shareholders, and a greater level of expertise and skill. All of these elements have the potential to impact positively on firm performance and value (see, Lamba and Stapledon, 2001; Denis and McConnell, 2003).

Therefore, the impact of concentrated equity ownership on firm-level corporate governance, firm value and performance, depends largely on a number of factors including the type of holding, who the blockholder is, the degree of ownership concentration, and the balanced and considered use of power and control (see for example, Barclay and Holderness, 1989; Denis and McConnell, 2003).

2.3.5.4. Cross-holdings

As discussed in the previous section, excessive and disproportionate control is often achieved through pyramid structures or cross-holdings (see, Claessens et al. 2002; Claessens and Fan, 2002, Dennis and McConnell, 2003; La Porta et al. 1999). A cross-holding is an equity holding whereby one company holds an equity holding in another company. Cross-holdings can create a stronghold of control, whereby groups of individual companies own interconnected holdings in each other (see, Denis and McConnell, 2003). Further, this intertwining of ownership and control creates a supportive situation where alliances of voting control are formed (Denis and McConnell, 2003). Group ownership structures are common globally, and these include the South Korean Chaebol and the Japanese Keiretsu (see, Claessens et al. 2002; Claessens and Fan, 2002; Denis and McConnell, 2003). Ownership groups and structures are also prevalent in India, Italy, Chile, Brazil, and South Africa (see, Denis and McConnell, 2003).

Ramsay and Stapledon (2001) conducted a study of Australian listed firms, reporting on the extent of corporate groups and pyramid structures in these firms and the
various interconnections of the structures. They observed that the firms in their study contained a substantial amount of these types of structures. Further, they found that some were quite complex, particularly in the case of cross-holdings (Ramsay and Stapledon, 2001). Firms with blockholdings face very different governance issues and problems compared to firms that do not have a large controlling shareholder (Bebchuk and Weisbach, 2010). For instance, the discipline of market for corporate control is less effective for firms with large controlling blockholders (see, Bebchuk and Weisbach, 2010). Companies will sometimes use cross-holdings in each other as a protection against hostile takeover, where one company resists and stands their ground (see, Denis and McConnell, 2003; Wenger and Kaserer, 1998). Protection against hostile takeover is most likely provided through interconnected ownership strongholds and voting alliances, further strengthening the company’s position (see, Denis and McConnell, 2003).

This may be part of the reason that the Australian market was described by Dignam and Galanis (2004) as having a weak market for corporate control. Dignam and Galanis (2004) observed at the time that there were substantial blockholders in Australian firms. Pham et al. (2011 and 2012) suggest that the market for corporate control in Australia is still not strong. In addition, the data for this study shows that a number of Australian firms still contain a substantial percentage of blockholdings and/or cross-holdings as a proportion of their total ownership structure.

2.3.6. Composite Measures of Corporate Governance

The DataStream corporate governance score is largely determined on a transparency score. It is an all-encompassing corporate governance score that is made up of a number of important corporate governance indicators. The DataStream corporate governance score measures systems, mechanisms, processes and practices related to the alignment of both the board of directors and management interests with the interests of the firm’s shareholders and also with the goal of shareholder wealth maximisation. Therefore, the score is based on elements of transparency combined with elements related to board structure, board function, compensation policy, shareholder rights and the company’s vision and strategy. The lowest value score is 0 and the highest and best score is 100 (DataStream, 2012). A comprehensive description of the DataStream corporate governance score is contained in Appendix 3.

Ferreira and Laux (2007) employed the Gompers index (Gompers et al. 2003), This index is based on a set of antitakeover-related governance provisions. Ferreira and
Laux (2007) found a strong negative relationship between the Gompers index and the idiosyncratic information content in stock returns, as measured by idiosyncratic volatility.

Linden and Matolcsy (2004) argue that the failure of large corporations over the years highlights the importance of having good corporate governance policies and practices in place. However, the results of their study showed little or no relationship between corporate governance scoring indicators and firm performance.

2.3.7. Corporate Governance and the Global Financial Crisis

The recent global financial crisis has highlighted a number of areas that need addressing. These include a need for improvements and reforms in financial markets regulation, and a review of corporate governance systems and practices globally (see for example, and related discussion, Claessens et al. 2010; Mazumder and Ahmad, 2010; Miele and Sales, 2011; Tomasic, 2011; Tomasic and Akinbami, 2011; Turner, 2009). In addition, Bebchuk and Weisbach (2010) point out some important issues of discussion that have come to the fore since the GFC. These include the role of shareholders in corporate governance; executive compensation; and the independence of compensation committees.

The financial crisis has exposed weaknesses not only in corporate governance systems but also weaknesses in risk assessment, risk identification, and risk management strategies (see for example, Brunnermeier, 2009a; Christensen and Kent, 2011; Kirkpatrick, 2009; Tomasic, 2011; Tomasic and Akinbami, 2011). Further, it is suggested that poor regulation of financial markets had placed investors in very precarious and unprotected positions (see for example, Claessens et al. 2010; Kirkpatrick, 2009; Lynch-Fannon, 2011; Tomasic, 2011; Tomasic and Akinbami, 2011). Erkens, Hung, and Matos (2012) investigated the impact of corporate governance structures and practices on the performance of a sample of financial firms from a number of countries that were at the centre of the global financial crisis. They found that firms that regularly took substantial risks before the crisis, performed poorly during the crisis compared to those that were not regular risk-takers. They also observed that firms that regularly took the greater risks were the firms with higher institutional ownership.

Along with internal controls, the Anglo-US system of corporate governance also relies on the discipline of the market (see, Charkham, 1995; La Porta et al. 1998; Monks, 2001). Lynch-Fannon (2011) argues that since the global financial crisis it has become obvious that the protection and discipline of the market is not the reliable external control tool that it was once considered to be. Hence, both internal controls and external controls
failed to protect investors globally (Lynch-Fannon, 2011). Therefore, along with failures in both internal and external governance controls, the financial crisis was the product of a number of factors. These factors include weak regulation, poor corporate governance systems and practices, and a lack of understanding and management of risk (see for example, and related discussion, Brunnermeier, 2009a; Christensen and Kent, 2011; Kirkpatrick, 2009; Lynch-Fannon, 2011; Tomasic, 2011; Tomasic and Akinbami, 2011).

2.3.8. Internal and External Governance Controls

Internal governance controls are based at the firm-level while external governance controls are market-based controls. Theoretically, both of these methods of corporate control are essentially focused on the alignment of management and shareholder interests and on the protection of minority and outside shareholders from insiders and controlling blockholders. The discipline of the market typically serves as a backup line of defence in the event that internal governance control mechanisms become ineffective and fail (see, Daily, Dalton, and Cannella, 2003; Walsh and Seward, 1990).

Internal governance control mechanisms include the board of directors, the ownership structure of a firm, and incentive alignment contracts. However, of all of these, the board of directors is the most important. This is because the board of directors is ultimately responsible for the overall governance of the organisation and for the goal of shareholder wealth maximisation to be upheld (see, Daily et al. 2003; Walsh and Seward, 1990). However, Walsh and Seward, suggest that this is can be a difficult task for the board, because often directors do not have enough time to adequately fulfil their roles, duties and responsibilities (see, Walsh and Seward, 1990). Therefore, monitoring can become weak so that poor management decisions, judgments and actions go unchecked. This eventually, combined with high agency costs, can impact negatively on firm value and performance (see, Walsh and Seward, 1990).

Walsh and Seward (1990) argue that both internal controls and external controls are important governance mechanisms that can work together. However, they suggest that firms in a well-organised capital market, should, in practice, be overall better off to make amendments to internal controls. Moreover, where appropriate internal-governance-control mechanisms are in place, and working effectively, there should be no need for external corporate control. Notwithstanding, corporate control contests are still commonplace in markets such as the US (see, Walsh and Seward, 1990).
The main model of corporate governance in common-law countries such as Australia is the market-based Anglo-US model (see, La Porta et al. 1998). However, even though a country’s capital market may be based on the Anglo-US model, it does not necessarily follow that an active market for corporate control is in the best interests and optimal value of that market and the participants of that market. This is particularly so if a market is relatively advanced, mature and well organised. It is important to study such a market in terms of the determinants of efficient and effective internal governance controls, because in the long-run a well-functioning capital market is better off to focus on a corporate governance environment that encourages improvements to internal governance controls for the maintenance of good corporate governance and firm performance. This is important for shareholder wealth maximisation, for fair and efficient financial markets, and ultimately for the wellbeing of the economy.

The Australian listed market is an example of a market with the characteristics outlined above. It does not have a strong market for corporate control, yet is a relatively advanced, mature, and well-organised market that relies heavily on internal governance controls rather than external controls for the maintenance of good corporate governance and firm performance (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012).

2.3.9. Corporate Governance and the Australian Listed Market

The Australian listed market is unique compared to other markets for a number of reasons. Firstly, Australia has a high level of institutional investors (mostly pension funds). Secondly, Australia has one of the highest levels of “mum and dad” investors in the world, whereby shares are held both directly and/or indirectly (see for example, Clark-Murphy and Soutar, 2004). Thirdly, the corporate governance environment in Australia is largely recommendations based, in that ASX recommendations are mostly non-mandatory for the majority of listed firms (see for example, and related discussion, Christensen et al. 2010). Fourthly, the Australian market for corporate control is not as strong, active, or effective as in US and UK markets (see for example, Dignam and Galanis, 2004; Pham et al. 2011 and 2012). Fifthly, the Australian market is a market with internal-governance-control characteristics (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012). All of these factors combined contribute to the uniqueness of the Australian market and its system of corporate governance (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012).
As discussed in Section 2.3.8, even though the Australian market is based on the Anglo-US model and is a mature and well-organised market, it does not have an active market for corporate control. Rather it relies more heavily on internal governance controls rather than external controls for the maintenance of good corporate governance and firm performance (see for example, Pham et al. 2011 and 2012). The market for corporate control typically serves as a backup line of defence in the event of failure of internal control mechanisms (see for example, Daily et al. 2003; Walsh and Seward, 1990). Walsh and Seward (1990) argue that both internal and external controls are important governance mechanisms that can work together. However, they suggest that considering the body of evidence over the years, it would indicate that firms in a market that is well organised and functioning efficiently should, in practice, be overall better off to make amendments to internal controls.

Therefore an efficient and well-organised market such as the Australian market, is better in the long-run to foster elements that lead to improvements in internal governance controls rather than go down the path of external corporate control contests and a costly cycle of takeovers (see for example, and related discussion, Walsh and Seward, 1990). This further highlights the importance of factors associated with internal governance controls such as board structure and composition, and also ownership structure in promoting and maintaining good corporate governance in Australian listed firms (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012).

Due to the structure of the Anglo-US form of corporation and the principle agent relationship that is typical of this corporate form, shareholders are at constant risk of expropriation by controlling shareholders and insiders. It is necessary therefore, that both an effective corporate governance system and an enforceable regulatory system are in place and functioning well. Moreover this is important for shareholder protection and for fair and efficient markets (see, La Porta et al. 2000).

Dignam and Galanis (2004) studied the history of corporate governance in the Australian listed market. They argue that corporate regulation in Australia prior to the 1990s was weak, piecemeal, and ineffective. The system was not strong enough to deal with the wide-spread corporate greed and reckless behaviour that ultimately led to a number of major corporate collapses in the 1980s. It became obvious that major regulatory reform was needed (Dignam and Galanis, 2004). This reform process instigated the development of ASIC as a national securities regulator, and the Corporations Act 2001 (Cth) as a single corporate statute whereby ASIC has the power to administer and enforce the requirements of the Act (Dignam and Galanis, 2004).
Corporate regulation in Australia is applied and maintained indirectly through a number of avenues including through various agencies, rules, regulations and recommended principles and practices, or directly through legislative acts, judgements and rulings (Corbett and Bottomley, 2004). The Australian system and approach to corporate governance is supported by Australia’s strong regulatory regime (see, Leeson et al. 2010). Australian companies have high standards of corporate governance with good governance structures and practices in place (see for example, and related discussion, ASX, 2012; Christensen et al. 2010; Kiel and Nicholson, 2003). However, ongoing review is required to maintain these high standards. This is important for investor protection and confidence (ASX, 2012). The ultimate aim of the ASX Corporate Governance Council is to promote and maintain investor confidence (ASX, 2012).

2.3.9.1. Voluntary adoption of Best Practice Corporate Governance and the Promotion of Good Corporate Governance of Australian listed firms

Australia’s best practice principles and recommendations for good corporate governance differ from those in the US, in that Australian corporate governance principles and recommendations are largely guidelines-based whereas in the US the corporate governance regime is largely a mandatory rules-based system (see, Arcot, et al. 2010). The ASX Corporate Governance Council provides recommendations and guidelines for good corporate governance, following an “if not, why not?” approach, similar in concept to the “comply or explain” approach used in the UK (see, Arcot, et al. 2010). According to the “if not, why not?” approach – if a firm does not follow a particular recommendation then they need to provide a good reason why (see, ASIC, 2012; ASX, 2012; Christensen et al. 2010).

ASX recommendations are non-mandatory for most Australian listed firms. The exceptions are that firms in the ASX500 must have an audit committee, while firms in the ASX300 must also adhere to Listing Rule 12.7 of the ASX best practice recommendations for audit committees. However, apart from these requirements all other recommendations are non-mandatory for these firms as well (see, ASX, 2012; Christensen et al. 2010). Christensen et al. (2010) examined whether the adoption of best practice corporate governance recommendations is associated with superior firm performance for Australian firms. They suggest that it is important to gauge the impact of voluntary adoption of best practice recommendations on firm performance. Christensen et al. (2010) found a negative correlation between board independence and firm performance, while, the adoption of board sub-committees was found to be positively correlated with firm performance.
Beekes and Brown (2006) investigated whether the quality of a company’s corporate governance is related to the quality of the company’s information flows. They found that Australian firms that employ better corporate governance principles and practices are, on the whole, better governed. In addition, such firms are typically more open and transparent, and make more informative disclosures (Beekes and Brown, 2006).

The voluntary adoption of corporate governance best practice recommendations flows into other areas of finance and accounting practices. For instance, Ahmed and Henry (2011) examined a connection between the voluntary adoption of corporate governance mechanisms by Australian firms and accounting conservatism. They found that firms that voluntarily adopted best practice corporate governance recommendations and guidelines (such as increasing the number of independent directors on their boards, limiting board size, and forming audit committees) also employed unconditional accounting conservatism as an additional control mechanism.

Good corporate governance plays an important role in creating value for shareholders by reducing real and perceived levels of risk for a firm (see for example, Pham et al. 2011 and 2012). In addition, firms with better governance practices and mechanisms in place are less exposed to agency risk and hence lower agency costs (see for example, Pham et al. 2011 and 2012). Therefore, suppliers of funds will require lower rates of return when a firm is perceived to be less risky. All of these aspects result in a lower cost of capital and improved firm value (see for example, Ashbaugh-Skaife, Collins, and LaFond, 2006 and 2009; Pham et al. 2011 and 2012).

2.3.10. Corporate Governance, Firm Performance and Value

Results are mixed in the literature on the impact of corporate governance on firm value and performance. However, most corporate governance studies find significant relationships between corporate governance variables and firm performance, and/or elements that contribute to firm performance (see for example, Agrawal and Knoeber, 1996; Hermalin and Weisbach, 1991; Li and Naughton, 2007; McConnell, Servaes, and Lins, 2008; Mórck, 1995; Kiel and Nicholson, 2003; Nguyen and Faff, 2006; Pham et al. 2012; Yermack, 1996). A selection of studies on the relationship between corporate governance and firm performance are briefly discussed below.

Agrawal and Knoeber (1996) studied seven mechanisms to control for agency problems, and the impact of these on firm performance (Tobin’s $Q$). The particular control mechanisms that they examined were institutional ownership, insider ownership, and
blockholdings. They also examined outside directors, debt financing, the managerial labour market, and the market for corporate control. Agrawal and Knoeber (1996) found a persistent negative correlation between outside directors and firm performance. They suggest a possible explanation for this result may be that, for political reasons, the scope and composition of a board is extended to include influential personalities such as, politicians, consumer representatives and environmental activists. Agrawal and Knoeber (1996) suggest that it may be these additional outside directors on the board that have a negative impact on firm performance.

McConnell et al. (2008) examined stock price responses to announcements of share purchases by insiders. They found there to be a positive relationship between firm value and change in ownership structure in the form of share purchases by insiders. McConnell et al. (2008) suggest that their results point to the existence of an optimal ownership structure that has a good balance of insider ownership with other ownership types. This is largely due to the need to balance factors associated with insider ownership, such as entrenchment, alignment of goals, and management incentives. Therefore, they concluded that there is an optimal ownership structure for a firm from the standpoint of firm value and performance. Moreover, changes in share ownership by insiders can, and does, impact on firm value (McConnell et al. 2008).

Linck et al. (2008) studied trends and determinants of board structure and compared board structure across small and large firms. They reported that larger firms tended to have larger more independent boards, while smaller firms with higher returns volatility tended to have smaller less independent boards. They also found that firms with high levels of managerial ownership tended to be connected to those firms with the smaller less independent boards. However, firms that had a powerful CEO in place, or where insiders were self-serving, tended to be associated with firms that had larger more independent boards. Linck et al. (2008) conclude that their empirical results indicate that firms choose board structure and composition based on a cost-benefit basis. For instance, the costs of increased monitoring compared to the benefits of reduced agency costs. In addition, they argue that their results show strong correlations between board structure and firm-level characteristics. In particular, they found strong associations between board structure and both firm size and insider ownership.

Pham et al. (2012) examined a number of firm-level corporate governance variables and their impact on firm performance. They used the weighted average cost of capital (WACC) as a measure of firm value/performance, because minimising the cost of capital improves firm value and performance. Pham et al. (2012) reported that institutional blockholdings, insider ownership, and board independence were negatively correlated with
WACC, while board size was found to be positively correlated with WACC. They suggest that this is because institutional blockholdings, a greater percentage of insider ownership, and smaller, more independent boards all help to reduce information asymmetries and perceived levels of risk for firms. Moreover, these factors have the effect of financial stakeholders requiring lower rates of return on capital provided and hence, impacting positively on firm performance. Pham et al. (2012) suggest that these results indicate that corporate governance plays an important role in firm value and performance.

In brief, Hess, Gunasekarage, and Hovey (2010) found that ownership structures conducive to good corporate governance have a positive impact on firm performance. Yermack (1996) found an inverse association between board size and firm value, suggesting that limiting board size improves board effectiveness and that this in turn improves firm performance. Christensen et al. (2010) found that the adoption of board sub-committees is positively correlated with firm performance. Finally, Durnev and Kim (2005) found that firms that are transparent with good corporate governance structures in place achieve relatively higher firm values.
2.4. The Relationship between Idiosyncratic Risk and Corporate Governance – A brief overview of theory, evidence, and a background discussion

This section discusses the relationship between idiosyncratic risk and corporate governance. There is limited research in the literature on the relationship between idiosyncratic risk and corporate governance. The Ferreira and Laux (2007) study is identified as the primary study of relevance to the current study, and is discussed briefly below.

2.4.1. Idiosyncratic Risk and Corporate Governance

Ferreira and Laux (2007) put forward that higher idiosyncratic volatility fosters elements that are indications of good corporate governance, such as better decision making by management, better capital budgeting, and more efficient capital investment. They also put forward that corporate governance can have a direct impact on equity prices and on the efficiency of equity prices. This is because elements such as greater transparency, openness to the discipline of the market, and informed trading by institutions can work together to influence the informational efficiency in stock prices (see also, Gompers et al. 2003). Ferreira and Laux (2007) point out that even though greater transparency makes a firm more exposed to takeover, it also leads to greater information flow and potentially better outcomes for the firm.

Ferreira and Laux (2007) studied the relationship between corporate governance (mostly in terms of governance policy on anti-takeover provisions) and idiosyncratic risk (mostly in terms of the information content of idiosyncratic volatility). They observed the unique path through the trading volume of arbitrage-oriented institutional investors to test a trading link hypothesis. Their study focused on the influence of unique corporate governance factors on firms’ openness to takeover, and how these factors impact on the information flow and the information content in stock prices. Ferreira and Laux (2007) analysed changes in idiosyncratic volatility relative to changes in the Gompers et al. (2003) governance index. Their tests focused directly on changes in levels of idiosyncratic volatility that are most likely attributed to the adoption or removal of takeover restrictions. Finally, Ferreira and Laux (2007) integrated a corporate governance-to-idiosyncratic volatility link into an analysis of the relationship between idiosyncratic risk and the quality of corporate investment decisions. The aim of this was to strengthen the interpretation of idiosyncratic risk as a measure of information flow.
Ferreira and Laux (2007) reported a strong negative relationship between corporate governance policy on antitakeover provisions and idiosyncratic risk. Specifically, they found a strong negative relationship between a firm’s antitakeover provisions (as measured by the Gompers et al. 2003 index) and firm-specific information flow (as measured by idiosyncratic volatility). In addition, Ferreira and Laux (2007) footnoted that following the literature on the relationship between idiosyncratic risk and expected returns (see for example, Goyal and Santa-Clara, 2003), and added to their findings on the relationship between corporate governance and idiosyncratic risk – there may well be a corporate governance-to-idiosyncratic volatility-to-expected returns link.

2.5. Focus of the Study

The literature reveals that idiosyncratic risk is an important factor impacting on markets, firms, stock prices and investment portfolios. For example, the literature finds that idiosyncratic risk is a dynamic element of information flow, market efficiency, asset price formation, firm performance, value and returns, and is therefore priced in the market (see for example, Angelidis, 2010; Ferreira and Laux, 2007; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997; Miller et al. 2002).

However, for markets to develop and maintain optimal efficiency and value there also needs to be an effective corporate governance system in place, and even more so since the GFC (see for example, Christensen and Kent, 2011; Mazumder and Ahmad, 2010; Miele and Sales, 2011; Tomasic, 2011; Tomasic and Akinbami, 2011; Turner, 2009). Hence, an important facet of idiosyncratic risk is the relationship of idiosyncratic risk with corporate governance (see, Ferreira and Laux, 2007). Moreover, idiosyncratic risk is both a potential indicator of good corporate governance and a determining factor for better corporate governance. Yet, at the same, corporate governance impacts on idiosyncratic volatility (see, Ferreira and Laux, 2007). Therefore, the relationship between idiosyncratic risk and corporate governance is the main focus of this study.

A review of the literature reveals a sparseness of studies on the relationship between idiosyncratic risk and corporate governance. In this study, based on the literature, it is argued that this is particularly so for a well-functioning market such as the Australian market that operates in an internal-governance-control system. That is, a corporate governance environment that is largely recommendations based and that relies heavily on
firm-level internal governance controls rather than external controls for the maintenance of good corporate governance and firm performance. Further, whilst there are mergers and takeovers in this market, they are not common phenomena (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012).

Therefore, the Australian market is a market with internal-governance-control characteristics that operates in an internal-governance-control system. For the remainder of this thesis markets that encompass these characteristics will be noted as markets with internal-governance-control characteristics, and a system of corporate governance that relies heavily on internal governance controls rather than external controls will be noted as an internal-governance-control system.

Thus, the current study will examine the relationship between idiosyncratic risk and corporate governance, and also the relationship between firm performance and corporate governance. The focus is on firm-level internal-governance-control measures based on board structure and composition, and on ownership and ownership structure as these are relevant for a market with internal-governance-control characteristics (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012). A market that fits these characterises well, is the Australian market. Thus, this study will apply data drawn from firms listed under the aforementioned internal-governance-control market conditions, recommendations and requirements of the Australian Securities Exchange (ASX).

Research will be conducted on these firms into the relationship between idiosyncratic volatility and corporate governance, as well as the relationship between firm performance and corporate governance. The corporate governance focus will be on aspects such as board structure and composition, including board characteristics such as the average number of other corporate affiliations of the board members, and gender diversity, and the impact of board structure on both idiosyncratic volatility and firm performance. The study will also focus on ownership and ownership structure, looking at various types of ownership, such as the percentage voting power of the single biggest blockholder, and cross-holdings. The impact of ownership structure on both idiosyncratic volatility and firm performance will also be studied.

In addition, a potential link between corporate governance, idiosyncratic volatility and firm performance will endeavour to be observed, motivated by footnoted comments made by Ferreira and Laux (2007), of a likely governance-to-volatility-to-expected returns link. If not directly measurable, it may be inferred following an analysis of regression
results for both idiosyncratic volatility on corporate governance, and firm performance on corporate governance.

Hence, this study will contribute to knowledge and literature on the relationship between idiosyncratic risk and corporate governance, and to the streams of literature on both idiosyncratic risk and corporate governance.

### 2.6. Summary and Concluding Comments

This chapter has reviewed relevant literature on theory, evidence and background discussion pertaining to both idiosyncratic risk and corporate governance, and also pertaining to the relationship between idiosyncratic risk and corporate governance.

Idiosyncratic risk is found to be relevant and important for equity returns, asset price formation, firm valuation and performance, and is a good risk proxy that is priced in the market (see for example, Drew et al. 2004; Drew et al. 2005; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997; Xu and Malkiel, 2003). Angelidis (2010) found that developed, more efficient markets contain higher levels of idiosyncratic volatility relative to less efficient emerging markets. This would indicate that the more efficient markets with greater information flow and information-rich security prices contain higher levels of idiosyncratic volatility. It would follow then that an efficient capital market is one that contains higher levels of idiosyncratic volatility, or alternatively, that higher idiosyncratic volatility creates a more efficient market. Thus, markets with greater information flow and therefore greater levels of idiosyncratic volatility are more efficient.

However, for well-functioning, fair and efficient financial markets, there also needs to be an effective corporate governance system in place. This is important for the financial protection and wellbeing of minority and outside shareholders and other financial stakeholders, and for the economic wellbeing and stability of firms, markets, the economy, and ultimately the wider community. Moreover, the literature reports that firm-level corporate governance impacts on equity prices, firm value and performance, whereby good corporate governance leads to better firm performance while weak corporate governance increases costs and leads to poorer performance (see for example, Albuquerque and Wang, 2008; Claessens, 1997; Cremers and Nair, 2005; Ferreira and Laux, 2007; Giroud and Mueller, 2011; Gompers et al. 2003; Kiel and Nicholson, 2003; Li and Naughton, 2007; Nguyen and Faff, 2006).
The Australian listed market is based on the Anglo-US model of corporate governance, and is a mature, well-organised, efficient market. However, the Australian market does not have an active market for corporate control as in the US and UK (see for example, Pham et al. 2011 and 2012). The Australian corporate governance environment is largely recommendations based, and relies heavily on firm-level internal governance controls rather than external controls for the maintenance of good corporate governance and firm performance. Further, whilst there are mergers and takeovers in this market, they are not common phenomena (see for example, and related discussion Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012). Therefore, the Australian market is a market with internal-governance-control characteristics that operates in an internal-governance-control system.

Based on the literature, the main motivating factor that has contributed to the focus and formation of this study is the relationship between idiosyncratic risk and corporate governance found by Ferreira and Laux, (2007) in a study of listed firms in the US. Thus, idiosyncratic risk is also likely to be related to corporate governance in the Australian market. Therefore, the relationship between idiosyncratic risk and corporate governance is the primary focus of this study. However, the current study does not focus on external governance controls and the information content of idiosyncratic volatility established by Ferreira and Laux (2007). The current study, instead, examines the relationship between idiosyncratic risk and corporate governance in terms of idiosyncratic returns volatility and in the context of a market with internal-governance-control characteristics.

A review of the literature reveals a sparseness of studies on the relationship between idiosyncratic risk and corporate governance, and particularly so for a well-functioning efficient market such as the Australian market with internal-governance-control characteristics. Hence, there is a need for further research and empirical analysis of the relationship between idiosyncratic risk and corporate governance in a market that encompasses these characteristics, and more so since the GFC. To my knowledge there are no studies on the relationship between idiosyncratic risk and corporate governance in the context of a market with internal-governance-control characteristics such as the Australian market.

Other contributing factors to influence the formation and focus of this study and choice of variables are firstly, the footnoted suggestion of Ferreira and Laux (2007), of a potential governance-to-volatility-to-expected returns link, and the inspiration to explore this concept by considering a corporate governance-to-idiosyncratic volatility-to-firm performance link. Secondly, reports in the literature that poor corporate governance and a lack of understanding and management of risk were contributing factors to the onset of the
recent global financial crisis and the downfall of many firms during that period. Thirdly, that firm-level internal governance controls based on both ownership structure and the board of directors are important for the maintenance of good corporate governance and firm performance in a market with internal-governance-control characteristics. Fourthly, that firm-level corporate governance variables based on board structure and composition and also ownership structure are more applicable for studies of a market with internal-governance-control characteristics such as the Australian market. Finally, based on the literature, it is important to test the findings and conclusions of influential US studies with studies of other markets with different characteristics to the US.

The current study differs from previous studies on idiosyncratic risk and also differs from previous corporate governance studies. This study will analyse idiosyncratic volatility in relation to corporate governance and the relationship between these two dynamic elements in a market that relies heavily on internal governance controls rather than external controls for the maintenance of good corporate governance and firm performance. Therefore, the current study will examine the relationship between idiosyncratic risk and corporate governance, and also firm performance and corporate governance in this context. The study will focus on firm-level internal-governance-control measures based on board structure and composition, and also on ownership and ownership structure, as these are more relevant for a market with internal-governance-control characteristics, such as the Australian market. Therefore, the primary focus of the study is on the relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics.

It is expected that this study will provide a valuable contribution to the knowledge, research and sparse literature on the relationship between idiosyncratic risk and corporate governance, and will also contribute to the literature on idiosyncratic risk, and also to the literature on corporate governance.
Chapter 3 RESEARCH METHODOLOGY

3.1. Introduction

Chapter 3 presents the research methodology, including the research questions, data, and variables used in the study. The chapter provides a review of the methods and approaches found in the literature and methods relevant to this study. The chapter discusses the focus of the study, the theoretical motivation, aims of the study, and expected findings. The data selection, and identification, and description of the variables are also contained in this chapter. This is followed by the chapter summary and concluding comments.

The primary focus of the study is on the relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics, and the primary research question is based on this. A secondary focus of the study is on the relationship between firm performance (specifically Tobin’s Q) and corporate governance also in this context, and the secondary research question is based on this. Then, a potential corporate governance-to-idiosyncratic volatility-to-firm performance link is considered. Therefore, the relationship between idiosyncratic risk and corporate governance is the primary focus of this study, and therefore idiosyncratic volatility (IVOL) is the primary dependent variable. Considering the performance of the firms is a secondary aspect of the study. Hence, performance (PFRM) is the secondary dependent variable, of which Tobin’s Q (TBNQ) is the main measure of performance.

This study is motivated by relevant aspects of corporate governance theory, and aspects of theory pertaining to idiosyncratic risk. The study is also motivated by the findings of Ferreira and Laux (2007) of a relationship between idiosyncratic risk and corporate governance in the US listed market. In addition, the study is motivated by the sparseness of research in this important area, and the challenge this poses to test this finding in a market with internal-governance-control characteristics, such as the Australian market.

The methodology applied to the research combines aspects of Christensen et al. 2010; Ferreira and Laux, 2007; Hess et al. 2010; Kiel and Nicholson, 2003; and Pham et al. 2011 and 2012, and a unique set of corporate governance variables. Firm-level, internal-control governance variables based on aspects of board structure and composition, and also
ownership structure are employed to study the relationship between idiosyncratic volatility and corporate governance, and the relationship between firm performance (Tobin’s $Q$) and corporate governance. Variables based on internal governance controls, as opposed to external controls are more appropriate for a market that relies on internal governance controls rather than external control for the maintenance of good corporate governance and firm performance, such as the Australian market (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012).

3.2. Focus of the Study

The literature reveals that idiosyncratic risk is a key factor impacting on firms, markets, and investment portfolios. For instance, the literature finds that idiosyncratic risk is a dynamic element of information flow, market efficiency, asset price formation, and firm performance, value and returns (see for example, Angelidis, 2010; Ferreira and Laux, 2007; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997; Miller et al. 2002).

However, for markets to develop and maintain optimal efficiency and value there also needs to be an effective corporate governance system in place, and even more so since the GFC (see for example, Christensen and Kent, 2011; Mazumder and Ahmad, 2010; Miele and Sales, 2011; Tomasic, 2011; Tomasic and Akinbami, 2011; Turner, 2009). Hence, a facet of idiosyncratic risk identified in the literature, is the relationship of this important element with corporate governance (see, Ferreira and Laux, 2007). Moreover, idiosyncratic risk is both a potential indicator of good corporate governance, and a determining factor in better corporate governance. Yet at the same corporate governance impacts on idiosyncratic volatility (see, Ferreira and Laux, 2007). Therefore the relationship between idiosyncratic risk and corporate governance is the main focus of this study.

A review of the literature reveals a sparseness of studies on the relationship between idiosyncratic risk and corporate governance. In this study, based on the literature, it is argued that this is particularly so for a well-functioning market such as the Australian market that operates in an internal-governance-control system. That is, a corporate governance environment that is largely recommendations based, and that relies heavily on firm-level internal governance controls rather than external controls for the maintenance of good corporate governance and firm performance. Further, whilst there are mergers and takeovers in this market, they are not common phenomena (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012).
As discussed in previous chapters, the Australian market is a market with internal-governance-control characteristics that operates in an internal-governance-control system. In this thesis, markets that encompass these characteristics are described as markets with internal-governance-control characteristics, and a system of corporate governance that relies heavily on internal governance controls rather than external controls, is called as an internal-governance-control system.

Thus this study is based on data drawn from firms listed under the aforementioned internal-governance-control market conditions, recommendations and requirements of the Australian Securities Exchange (ASX). Research is conducted into the relationship between idiosyncratic volatility and corporate governance (in addition to the relationship between firm performance and corporate governance). The corporate governance focus of the study is on board structure and ownership structure, and the impact of these on both idiosyncratic volatility and firm performance. In addition, a potential link between corporate governance, idiosyncratic volatility and firm performance is endeavoured to be observed following an analysis of regression results for both idiosyncratic volatility on corporate governance, and firm performance on corporate governance.

3.3. Research Questions

The research questions presented and discussed in the sections below are comprised of two research questions and a sub-research question. The primary focus of the study is on the relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics, and Research Question 1 is based on this. A secondary focus of the study is on the relationship between firm performance (Tobin’s Q) and corporate governance in a market identified to have internal-governance-control characteristics, and Research Question 2 is based on this. Another focus of the study is on a potential corporate governance-to-idiosyncratic volatility-to-firm performance link, and this is the basis of the Sub-research Question.

To address the research questions, the relationship between idiosyncratic volatility and corporate governance is examined, along with the relationship between Tobin’s Q and corporate governance. Then, a potential corporate governance-to-idiosyncratic volatility-to-firm performance link is considered.
3.3.1. Research Question 1

Is there a relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics?

The findings of Research Question 1 will be concluded following tests and analysis of results for secondary Research Questions 1 (a) and 1 (b).

It is expected that this analysis will find idiosyncratic risk to be positively related to aspects of board structure and composition and also to aspects ownership structure that are conducive to good corporate governance.

This supposition is based on findings of Ferreira and Laux (2007) who studied similar but different aspects of idiosyncratic risk and corporate governance in terms of the information content of idiosyncratic volatility with a focus on the relationship between idiosyncratic risk and corporate governance. The focal point of the corporate governance aspect of the Ferreira and Laux (2007) study was based on external governance control mechanisms, and openness to the discipline of the market. Ferreira and Laux (2007) found that firms with less antitakeover provisions, and therefore greater openness to market control, experienced higher idiosyncratic volatility, which in turn lead to better corporate governance.

The current study proposed here is focused on internal governance controls based on aspects of board structure and composition and also on ownership structure, rather than external controls, as these are more relevant to firms and markets such as the Australian market (see for example, Christensen et al. 2010; Pham et al. 2011 and 2012), which has internal-governance-control characteristics, and which operates in an internal-governance-control system (see Chapter 2, Section 2.3.8). Therefore, this study expects that internal governance controls conducive to good corporate governance will be positively related to idiosyncratic volatility and also to firm performance.

3.3.1.1. Secondary Research Question 1(a)

Is there a relationship between idiosyncratic risk and board structure and composition?

To address this question, idiosyncratic volatility (IVOL) is regressed on a unique set of corporate governance variables based on board structure and composition. These include the percentage of non-executive directors on the board (B_NEDS); percentage of
women on the board (B_GD); average number of other corporate affiliations of the board members (B_AFF); and board size (B_SZE).

3.3.1.2. Secondary Research Question 1(b)

**Is there a relationship between idiosyncratic risk and ownership and ownership structure?**

This question is addressed by regressing idiosyncratic volatility (IVOL) on a unique set of corporate governance variables based on ownership and ownership structure. These include the percentage of cross-held shares (O_XHLD); percentage of institutional held shares (O_INST); percentage of shares held by insiders (O_INSDR); percentage voting rights/voting power of the single biggest blockholder (VP_BH).

3.3.2. Research Question 2

**Is there a relationship between firm performance (Tobin’s Q) and corporate governance in a market with internal-governance-control characteristics?**

The results to this research question will be concluded following tests and analysis of results for secondary Research Questions 2 (a) and 2 (b).

It is expected that this analysis will find firm performance to be positively related to aspects of board structure and composition and also to aspects of ownership structure, conducive to good corporate governance.

Although firm performance and corporate governance has been widely researched, and positive relationships found (see for example, Adams and Mehran, 2012; Albuquerque and Wang, 2008; Bonn, 2004; Hess et al. 2010; Li and Naughton, 2007; McConnell et al. 2008), it is expected that the current study will add a valuable contribution to the literature in a number of ways. Firstly, this study conducts an analysis of the relationship between firm performance and corporate governance from the perspective of a market identified to have internal-governance-control characteristics and which operates largely in an internal-governance-control system that does not rely on frequent intervention or discipline of the market. Secondly, the current study employs a unique set of firm-level, internal-governance-control variables based on board structure and composition and also on ownership structure, as these are more relevant for the Australian market (see for example,
Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012), which is identified as a market with internal-governance-control characteristics. Thirdly, an analysis of the relationship between firm performance and internal-governance-control measures is important to this study for the part that this relationship plays in an investigation into a potential corporate governance-to-idiosyncratic volatility-to-firm performance link.

3.3.2.1. Secondary Research Question 2(a)

Is there a relationship between Tobin’s Q and board structure and composition?

To address this question firm performance, Tobin’s Q (TBNQ) is regressed on firm-level, internal-governance-control variables based on board structure and composition. These include the percentage of non-executive directors on the board (B_NEDS); percentage of women on the board (B_GD); average number of other corporate affiliations of the board members (B_AFF); and board size (B_SZE)

3.3.2.2. Secondary Research Question 2(b)

Is there a relationship between Tobin’s Q and ownership and ownership structure?

This question is addressed by regressing firm performance, Tobin’s Q (TBNQ) on firm-level, internal-governance-control variables based on ownership structure. These include the percentage of cross-held shares (O_XHLD); percentage of institutional held shares (O_INST); percentage of shares held by insiders (O_INSDR); percentage voting rights/voting power of the single biggest blockholder (VP_BH).

3.3.3. Sub-Research Question

Is there a corporate governance-to-idiosyncratic volatility-to-firm performance link?

To address the Sub-research Question an analysis is conducted of the results of regressions conducted in response to all of the previous research questions.
It is expected that the study will find an implied corporate governance-to-idiosyncratic volatility-to-firm performance link following the testing and analyses of Research Questions 1 and 2.

Ferreira and Laux (2007) footnoted the suggestion of a likely governance-to-volatility-to-expected returns link, based on their own findings and the findings of others such as Goyal and Santa-Clara, (2003), who found a positive relationship between idiosyncratic volatility and expected returns. The current study builds on this footnoted suggestion to propose a potential corporate governance-to-idiosyncratic volatility-to-firm performance link.

3.4. Review of Methods Relevant to the Study

As discussed, the methodology applied in the present study is a combination of the methodology of Christensen et al. (2010); Ferreira and Laux, (2007); Hess et al. (2010); Kiel and Nicholson, (2003); Pham et al. (2011 and 2012). The present study examines the relationship between idiosyncratic volatility and corporate governance, and between firm performance and corporate governance, employing Ordinary Least Squares (OLS) regression analysis, and also the Two-stage Least Squares (2SLS) instrumental variables approach to control for any endogenous relationships between the variables. Both pooled and annual data is used. The contribution and focus of the study is on idiosyncratic volatility and a unique list of corporate governance variables based on internal governance controls, and also firm performance, primarily Tobin’s $Q$, for Australian firms listed on the ASX300.

Both OLS and 2SLS regression models are commonly used forms of analyses for empirical studies in the literature (see for example, Agrawal and Knoeber, 1996; Christensen et al. 2010; Claessens, 1997; Claessens and Djankov, 1999; Demsetz and Villalonga, 2001; Ferreira and Laux, 2007; Hermelin and Weisbach, 1988; Hermelin and Wallace, 2001; Hess et al. 2010; Kiel and Nicholson, 2003; McConnell and Servaes, 1990; McConnell et al. 2008; Mörck et al. 1988; Pham et al. 2011 and 2012). Furthermore, the market based measure of Tobin’s $Q$ is the primary performance measure used in the study. This measure is commonly used in the literature (see for example, Brown and Caylor, 2006; Cho, 1998; Christensen et al. 2010; Claessens et al. 1997; Davies, Hillier, and McColgan, 2005; Hess et al. 2010; McConnell and Servaes, 1990, 1995; McConnell et al. 2008; Short and Keasey, 1999).
In response to Research Question 1, the present study builds on aspects of the findings of Ferreira and Laux (2007) who found a positive relationship between idiosyncratic risk and corporate governance.

In response to Research Question 2, the study builds on aspects of studies that have found positive relationships between firm performance and corporate governance (see for example, Adams and Mehran, 2012; Anderson et al. 2004; Belkhir, 2009; Brown and Caylor, 2006; Gompers et al. 2003; Hess et al. 2010; Kiel and Nicholson, 2003; Larcker, Richardson, and Tuna, 2007; Li and Naughton, 2007; Pham et al. 2012).

Ferreira and Laux (2007) is an empirical analysis using both separate and composite governance measures to study the relationship between idiosyncratic risk (mostly in terms of idiosyncratic information), and corporate governance (mostly in terms of antitakeover provisions), plus various measures of firm performance for US firms. Ferreira and Laux (2007) conducted a series of regression analyses, using both pooled and panel data. They employed various methods to address potential endogeneity of the variables. In essence their results imply that higher levels of idiosyncratic volatility are indicative of better corporate investment, management actions and decision making, greater transparency, and therefore better corporate governance. Extending Ferreira and Laux (2007), this study also examines the relationship between idiosyncratic risk and corporate governance, and also firm performance and corporate governance, through a series of regression analyses, that also control for any endogenous relationships between the variables, because corporate governance variables are known to have problems with endogeneity (see for example, Agrawal and Knoeber, 1996; Ferreira and Laux, 2007; Hess et al. 2010; Pham et al. 2011 and 2012).

Christensen et al. (2010); Kiel and Nicholson, (2003); and Pham et al. (2011 and 2012), are Australian corporate governance studies employing various regression models including OLS and 2SLS, to examine the relationship between corporate governance and firm performance, while also controlling for endogeneity among the variables. These studies based their governance variables on internal control measures, and used both market and accounting based measures of firm performance, with Tobin’s Q as one of the main performance measures.

In addition, all of these studies focused on the Australian market, which is a market with internal-governance-control characteristics operating in an internal-governance-control system. Extending on Christensen et al. 2010; Kiel and Nicholson, 2003; and Pham et al. 2011; 2012, the present study is also an analysis of a market with internal-governance-control characteristics and therefore employs corporate governance variables
based on internal governance control measures such as board structure and composition, and also ownership structure. The primary focus of this study is on the relationship between idiosyncratic volatility and corporate governance, while also examining the relationship between firm performance and corporate governance.

In response to the sub-research question, the study will build on aspects of the footnoted notion of Ferreira and Laux (2007) of the likelihood of a governance-to-volatility-to-expected returns link, to consider a slight variation of the hypothesis – a possible corporate governance-to-idiosyncratic volatility-to-firm performance link. This notion will be explored following an analysis of results and findings of regressions conducted in response to Research Questions 1 and 2.

Therefore, in brief, the methodology applied in this study is a unique combination of aspects of Christensen et al. 2010; Ferreira and Laux, 2007; Hess et al. 2010; Kiel and Nicholson, 2003; and Pham et al. 2011; 2012, and a unique set of corporate governance variables based on board structure and ownership structure. This study is an analysis of a market with internal-governance-control characteristics, therefore the corporate governance variables used are based on firm-level internal-governance-control measures. Corporate finance based measures of idiosyncratic volatility and firm performance are used, whereby idiosyncratic volatility (IVOL) it the primary dependent variable, while performance (PFRM) is the secondary dependent variable, of which Tobin’s Q is main performance measure. The study employs both OLS and 2SLS regression analyses to empirically analyse the relationships between idiosyncratic volatility and corporate governance, and also between firm performance and corporate governance. Following the regression analyses conducted in response to Research Questions 1 and 2, the study explores a potential corporate governance-to-idiosyncratic volatility-to-firm performance link.

3.5. Theoretical Motivation

A review of the literature on both idiosyncratic risk and corporate governance has provided the theoretical motivation for this study, as discussed in Chapter 2 and additionally briefly below.

The literature on idiosyncratic risk reveals a number of facets and theoretical underpinnings of idiosyncratic risk, and also reveals the importance of idiosyncratic risk for firms and markets. Idiosyncratic risk is found to be priced in the market and is a relevant and contributing factor for asset price formation, investment returns, firm value
and performance (see for example, Drew et al. 2004; Drew et al. 2005; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997; Xu and Malkiel, 2003). Moreover, it is found that developed, more efficient markets contain higher levels of idiosyncratic volatility relative to less efficient, emerging markets (see for example, Angelidis, 2010; Durnev et al. 2004; Mőrck et al. 2000). This would indicate that efficient markets, which are typically characterised by greater information flow, and information-rich security prices, also contain higher levels of idiosyncratic volatility compared to less developed, less efficient markets.

Ferreira and Laux (2007) studied idiosyncratic volatility as a measure of information flow, and found that the greater the level of idiosyncratic returns volatility, the greater the degree of idiosyncratic information inherent in stock prices. Further, they put forward that this dynamic leads to better corporate governance, in that it fosters elements that are indications of good corporate governance (Ferreira and Laux, 2007). Thus, based on the literature, idiosyncratic risk is an important factor for firms and markets, and is therefore analysed in this study.

A review of corporate governance literature reveals number of facets and theoretical underpinnings of corporate governance, and also reveals the importance of corporate governance for firms and markets. Firm-level corporate governance is found to influence equity values and performance, where good corporate governance leads to better firm performance, while weak corporate governance increases costs and leads to poorer performance (see for example, Albuquerque and Wang, 2008; Cremers and Nair, 2005; Ferreira and Laux, 2007; Giroud and Mueller, 2011; Gompers et al. 2003; Kiel and Nicholson, 2003; Nguyen and Faff, 2006).

The main form of corporate governance in common law countries such as Australia is the market-based Anglo-US model. The model is fundamentally concerned with agency theory and the principle-agent relationship, where the main purpose of a corporate governance system is for the protection of minority and outside shareholders from expropriation by large powerful shareholders and insiders (see, La Porta et al. 2000). Therefore, based on the literature, corporate governance is an important factor for firms and markets that is also analysed in this study.

Agency theory comes under the umbrella of the finance model, which is a theoretical model predominately concerned with shareholder wealth maximisation. Application of the model deals with the protection of shareholders and the alignment of management and shareholder interests through both internal and external controls (see for example, Blair, 1995; Shleifer and Vishny, 1997). Internal governance controls are firm-
level controls that rely on elements such as the board of directors and ownership structure, whereas, external controls are market-based controls that serve as a backup line of defence in the event that internal controls fail (see, Walsh and Seward, 1990). Walsh and Seward (1990) discuss that both internal and external controls are important governance mechanisms that can work together. However, firms in a well-organised capital market, should, in practice, be overall better off to make amendments to internal controls. Furthermore, when there are appropriate internal governance control mechanisms in place and working effectively, there should be no need for external corporate control (see, Walsh and Seward, 1990). Therefore an efficient and well-organised capital market should be better off in the long-run to foster elements that lead to improvements to internal governance controls, rather than go down the path of external corporate control contests, and costly takeover cycles (see for example, and related discussion, Walsh and Seward, 1990).

The Australian market is based on the Anglo-US model of corporate governance, and is a mature, well-organised market. However, it does not have an active market for corporate control, as in the US and UK (see for example, Dignam and Galanis, 2004; Pham et al. 2011 and 2012). Australia is a market with internal-governance-control characteristics that relies more heavily on internal controls rather than external controls for the maintenance of good corporate governance and firm performance (see for example, Pham et al. 2011 and 2012). Therefore, the corporate governance focus of this study is on internal governance controls as these are more relevant for a market with these characteristics.

There is a strong focus in the literature on the role and function of the board of directors as an important internal governance control mechanism for the maintenance of good corporate governance and firm performance (see for example, Adams et al. 2010; Coles et al. 2008; Cotter and Silvester, 2003; Kiel and Nicholson, 2003). Ownership structure is also widely studied in the literature, and is identified as an important factor in internal governance control, and ultimately firm performance (see for example, Anderson et al. 2003; Anderson and Reeb, 2003; Claessens et al. 2002; McConnell et al. 2008; Mórck and Young, 2004). Therefore, internal governance control mechanisms based on board structure and ownership structure, are important factors for a market with internal-governance-control characteristics such as the Australian market, and are therefore analysed in this study.

Ferreira and Laux (2007) has provided theoretical motivation for this study, by reporting a relationship between corporate governance and idiosyncratic risk, and also footnoting the suggestion of a likely governance-to-volatility-to-expected returns link.
Ferreira and Laux (2007) studied the relationship between corporate governance policy (mostly in relation to antitakeover provisions) and idiosyncratic risk (mostly in terms of idiosyncratic information flow) in the US listed market. They argue greater transparency and higher idiosyncratic volatility, fosters better corporate investment decisions and more optimal capital budgeting, and that these are indications of good corporate governance. Ferreira and Laux (2007) argue that even though greater transparency and openness to the market, increases a firm’s exposure and vulnerability to takeover, it leads to better corporate governance and ultimately better outcomes for the firm.

Extending on Ferreira and Laux (2007), the present study examines the relationship between idiosyncratic volatility and corporate governance, and also firm performance and corporate governance, using Tobin’s $Q$ as the primary performance measure. The study will then consider a potential corporate governance-to-idiosyncratic volatility-firm performance link. However, the present study will not attempt to re-establish the information content of idiosyncratic volatility, nor replicate the use of governance policy on antitakeover provisions. The current study, will, instead, focus on idiosyncratic risk in terms idiosyncratic returns volatility, and corporate governance, in terms of internal governance controls based on board structure and ownership structure. Moreover, variables based on internal governance controls are more relevant for a market with internal-governance-control characteristics, such as the Australian market (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012).

In addition, Australian firms function in a corporate governance environment of best practice guidelines and recommendations (see for example, Christensen et al. 2010), as opposed to the mandatory rules-based regime of the US (see, Arcot, et al. 2010). Hence, all of these factors combined, add to the uniqueness of the Australian market and system of corporate governance (see for example, and related discussion, ASX, 2012; Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012). Therefore, the Australian market and system of corporate governance offers distinctive opportunities to study corporate governance in this unique environment (see, Pham et al. 2011 and 2012).

The recent financial crisis has revealed weaknesses and failures in financial markets regulation and corporate governance systems globally, including failures in both internal and external controls (see for example, Claessens et al. 2010; Lynch-Fannon, 2011; Tomasic, 2011; Turner, 2009). As a last line of defence, external controls failed to protect investors and corporations globally during that period, and therefore not the reliable external control mechanism once thought (see, Lynch-Fannon, 2011).
The financial crisis has also exposed a lack of understanding and of management of risk (see for example, Ahrens et al. 2011; Brunnermeier, 2009a and 2009b; Erkens et al. 2012; Kirkpatrick, 2009; Tomasic and Akinbami, 2011). It is suggested that corporate governance and risk management are inherently connected, and hence, it is no surprise that the financial crisis has not only exposed weaknesses in corporate governance systems, but also weaknesses in risk assessment and risk management (see for example, Brunnermeier, 2009a and 2009b; Christensen and Kent, 2011; Kirkpatrick, 2009; Tomasic, 2011).

Based on the literature, there is a need for both a better understanding of risk and improved corporate governance (see for example, Ahrens et al. 2011; Brunnermeier, 2009a and 2009b; Erkens et al. 2012; Kirkpatrick, 2009; Tomasic, 2011; Tomasic and Akinbami, 2011). Therefore, the primary focus of this study is on the relationship between idiosyncratic risk and corporate governance. Moreover, considering the uniqueness and internal-governance-control characteristics of the Australian listed market (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012), the primary focus of this study is on the relationship between idiosyncratic risk and corporate governance in this context.

This study will add a valuable contribution to the sparse literature on the relationship between idiosyncratic risk and corporate governance, while also contributing to the wider body of corporate governance literature, and the wider body of literature on idiosyncratic risk. To my knowledge the relationship between idiosyncratic risk and corporate governance has not been previously studied in the context of a market with internal-governance-control characteristics, such as the Australian market. Hence, the study will add a valuable contribution to the knowledge and literature on the relationship between idiosyncratic risk and corporate governance, and to the study of markets with internal-governance-control characteristics.

3.6. Aims of the Study

To date, very little work has been dedicated the study of a relationship between idiosyncratic risk and corporate governance. To my knowledge the relationship between idiosyncratic risk and corporate governance has not been previously studied in the context of a market with internal-governance-control characteristics, such as the Australian market. Therefore, the primary aim of this study is to examine this relationship in this context.
In this process, the study aims to examine the relationship between idiosyncratic volatility and corporate governance, and also firm performance and corporate governance. Then the study endeavours to explore a potential link between corporate governance, idiosyncratic volatility, and firm performance. Thus, this study aims to contribute to the insight and understanding of the relationship between idiosyncratic risk and corporate governance for future corporate finance research and modelling.

It is proposed that the better governed firms will be the ones that contain higher levels of idiosyncratic volatility, and that these firms will also be the better performing firms, and therefore better investment choice for investors. The study aims to improve capacity for the identification of better governed, better performing firms. Therefore, the present study aims to contribute to the knowledge and research on the relationship between idiosyncratic risk and corporate governance, while also contributing to the wider body of existing corporate governance literature, and to the literature on idiosyncratic risk.

3.7. Expected Findings and Outcomes

Firstly, it is expected that variables based on firm-level corporate governance will have significant relationships with firm-level idiosyncratic volatility, and that idiosyncratic risk is found to be relevant for a firm’s corporate governance as found by Ferreira and Laux (2007). However, in this instance, in a market with internal-governance-control characteristics, employing a unique and different set of corporate governance variables based on board structure and ownership structure, as these are more relevant to a market with these characteristics. Secondly, it is expected that the relationship between firm performance and variables conducive to good corporate governance, will be found to be positive and significant in a market with these characteristics. Thirdly, it is expected that the findings of this study will point to an implied corporate governance-to-idiosyncratic volatility-to-firm performance link, as inspired by the footnoted suggestion of Ferreira and Laux (2007), of a potential governance-to-volatility-to-expected returns link.

Fourthly, it is expected that the use of variables appropriate to a particular market, will provide a clearer picture, and more accurate and robust results, leading to more realistic and relevant conclusions, that are not only applicable to the market under examination, but also relevant for other similar markets. Therefore, it is expected that this study will contribute to the research of a market with internal-governance-control characteristics, such as the Australian market. Finally, it is expected that the findings and
conclusions of this study will contribute to greater insight and understanding into the relationship between idiosyncratic risk and corporate governance for future research and comparative studies, and for future corporate finance research and modelling. In addition, it is expected that this study will add a valuable contribution to the knowledge and research of a relationship between idiosyncratic risk and corporate governance, and will also contribute to the streams of literature on both idiosyncratic risk and corporate governance.

3.8. Identification and Description of the Models

Methods of analysis used in corporate governance studies include Ordinary Least Squares (OLS) regressions, Two-stage Least Squares (2SLS) regressions, fixed-effects regression analyses, piecewise linear regressions, plus, logit and probit models. Event studies and both cross-sectional and time-series studies are employed. Annual and pooled data is used. For instance, Hess et al. (2010) used both pooled and annual data, and Ferreira and Laux (2007) conducted both pooled and panel regressions.

An in-depth review of the literature reveals that, of the variety of statistical methods that are used to analyse corporate governance variables, the most common of these are the Ordinary Least Squares (OLS), and the Two-stage Least Squares (2SLS) regression models (see for example, Agrawal and Knoeber, 1996; Brown and Caylor, 2006; Claessens et al. 2003; Claessens and Laeven, 2005; Demsetz and Villalonga, 2001; Ferreira and Laux, 2007; Hermalin and Wallace, 2001; Hess et al. 2010; Hutchinson and Gul, 2004; Hutchinson and Gul, 2006; McConnell et al. 2008; Pham et al. 2011 and 2012). Further, there is evidence in the literature that researchers concerned with studies of firm-level returns volatility have also used OLS and variations of OLS regression analyses as part of their studies (see for example, Bebchuk, Cohen, and Ferrell, 2009; Bushee et al. 2009; Dechow, Hutton, and Sloan, 2000; Drobeth, Schillhofer, and Zimmermann, 2004; Spiegel and Wang, 2005).

It is important to control for potential endogenous relationships when analysing governance variables (see, Hess et al. 2010; Pham et al. 2011 and 2012). For instance, Hess et al. (2010) employed both OLS and 2SLS regressions models to control for potential endogenous relationships between ownership and firm performance, in particular, between a variable representing concentrated ownership and Tobin’s \( Q \), and also private blockholders and Tobin’s \( Q \).

Therefore the current study employs both OLS and 2SLS regression models to control for potential endogenous relationships. The study also tests for a suspected
endogenous relationship. A description of both the OLS and 2SLS regression models, plus an endogeneity test, is given below:

3.8.1. Ordinary Least Squares (OLS)

The OLS regression model is a standard linear regression model that is a statistical approach to the multiple regression model. The standard linear regression model is depicted as:

\[ y = X \beta + \epsilon \]

Where:
- \( y \) is the stochastic n*1 vector of observations on the dependent variable;
- \( X \) is the deterministic n*k matrix of observations on the independent variables;
- \( \beta \) is the unknown k*1 vector of regression parameters;
- \( \epsilon \) is a n*1 vector of unobserved disturbance;
- \( n \) is the number of observations;
- \( k \) is the number of exogenous variables used in the right hand side of the econometric equation.

The key assumption of the standard linear regression analysis is that the independent variables are statistically independent of the error term. Therefore, given the standard linear regression model shown above, it would follow that the OLS estimator, \( \hat{\beta}_{OLS} = \beta + (XX)^{-1}X'\epsilon \) is a consistent estimator of the true coefficient, when \( E(\epsilon | X) = 0 \). In this case the regressors are said to be exogenous. This means that they are determined outside the model (see, Greene, 2002).

3.8.2. Two-Stage Least Squares (2SLS)

The 2SLS model used in this study is an instrumental variables approach, where, a set of instrumental variables must be determined and used. 2SLS is used in conjunction with, or in place of, an OLS regression analysis when it is suspected that one or more of the explanatory variables has an endogenous relationship with the dependent variable.

The two stages of the 2SLS regression are as follows: Firstly, the model finds those portions of the endogenous and exogenous variables that can be attributed to the instruments. This involves estimating an OLS regression of each variable in the model on the set of instruments. The second stage of the 2SLS is a regression of the original equation with all of the variables replaced by the fitted values determined in the first-stage
regressions. The coefficients of this second stage regression are the 2SLS estimates. Therefore, for the 2SLS regression analysis to be run there needs to be a dependent variable, the independent variables, and a list of instrumental variables. The instrument specification must satisfy the order condition for identification, that is, there must be at least as many instruments as there are coefficients in the model.

Further, an instrumental variable must have two properties. Firstly, it must be uncorrelated with the error term, and secondly, it must explain part of the variability in the endogenous regressor. The best choice for instrumental variables can be any independent variables useful for predicting the dependent regressor. Assume \( Z \) represents the instruments of the variables. Hence, the 2SLS estimator for \( \beta \) is depicted as:

\[
\hat{\beta}_{IV} = \beta + (X'P_ZX)^{-1}X'P_Z\epsilon
\]

Where:

\[
P_Z = Z(Z'Z)^{-1}Z'
\]

\( Z \) is an \( n \times q \) matrix containing the instrumental variables

The 2SLS estimator \( \hat{\beta}_{IV} \) is a consistent estimator of \( \beta \) when the endogenous regressor is replaced by a fitted value that is constructed from a set of instrumental variables, since these instruments should be uncorrelated with the error term, that is, \( E(\epsilon | Z) = 0 \) (see, Pindyck and Rubinfeld, 1991).

When regressors are exogenous and determined outside the model, and therefore not endogenous, the OLS estimator is a consistent estimator of the true coefficient. However if this assumption is not true, that is, if the regressors vary systematically with the error term, then the OLS estimated coefficients are inconsistent and biased. In this instance the regressors might fail to be independent because they are simultaneously determined along with the dependent variable. This occurs when there is a feedback relationship between one or more of the explanatory variables and the dependent variable. However, if there is not an endogeneity problem, both the least squares estimator and the instrumental variables estimator are consistent. However, in this situation, the least squares estimator is the most efficient (see, Greene, 2002).

### 3.8.3. Test for endogeneity

Generalized Method of Moments (GMM) is the method used in this study for testing for suspected endogeneity of the measures (see, Newey, 1985). The criterion for analysing the outcome of the test is as follows:
If there is a statistically insignificant difference between the j-stats of the restricted test equation and the unrestricted test equation, then the null hypothesis cannot be rejected. If the null hypothesis cannot be rejected, then there is no evidence of endogeneity amongst the variables tested. In this instance, both the OLS estimation and the 2SLS, instrumental variables estimation will be consistent and both may be used. However, the OLS estimation will be the most efficient.

However, if there is a statistically significant difference in the j-stats between the restricted test equation and the unrestricted test equation, then the null hypothesis is rejected. Therefore, in that case, the OLS estimation will not be consistent and should not be used. The 2SLS, instrumental variables estimator will be a consistent estimator in this instance, and should be the one used (see, Newey, 1985).

3.9. Regression Models

This section presents the various regression models used in the study. Equations 1 to 4 are constructed for the pooled OLS regressions for both idiosyncratic volatility on corporate governance, and also firm performance on corporate governance. Equation 5 is specified for the pooled 2SLS regression for idiosyncratic volatility and corporate governance, while equation 6 is specified for the pooled 2SLS regression for firm performance and corporate governance. Equations 7 to 10 are constructed for the various annual OLS regression analyses for idiosyncratic volatility on corporate governance, and also firm performance on corporate governance. Each of the models are depicted and described fully in the sections below.

Idiosyncratic volatility (IVOL) is the primary focus of the study and therefore the primary dependent variable that is used in Research Question 1. Considering the performance of the firms is a secondary aspect of the study. Therefore, performance (PFRM) is the secondary dependent variable, of which Tobin’s Q (TBNQ) is the main performance measure, and is used for Research Question 2.

3.9.1. Pooled OLS Regressions

Equation one below is modelled to test for a relationship between idiosyncratic volatility and corporate governance, specifically ownership structure. Equation two is
modelled to test for a relationship between firm performance and ownership structure. Both models are constructed for the purpose of pooled data (2006-2011) analysis. However, note that with all of the pooled regressions, one of the six dichotomous year dummies is dropped in each instance to avoid the dummy variable trap (see, Gujarati, 1995).

As discussed above, the relationship between idiosyncratic risk and corporate governance is the primary focus of this study. Therefore idiosyncratic volatility (IVOL) is the primary dependent variable, and is used for Research Question 1. The relationship between firm performance and corporate governance is a secondary focus of the study. Hence, performance (PFRM) is the secondary dependent variable, of which Tobin’s Q (TBNQ) is the main measure of performance. Therefore, Tobin’s Q (TBNQ) is used for Research Question 2, while both ROA and ROE are run for the purpose of robustness tests.

Equation 1 – Idiosyncratic Volatility and Ownership Structure

\[ IVOL = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O\_XHLD} + \beta_6 \text{O\_INST} + \beta_7 \text{O\_INSDR} + \beta_8 \text{YRD2010} + \beta_9 \text{YRD2009} + \beta_{10} \text{YRD2008} + \beta_{11} \text{YRD2007} + \beta_{12} \text{YRD2006} + \epsilon \]

Equation 2 – Performance and Ownership Structure

\[ PFRM = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O\_XHLD} + \beta_6 \text{O\_INST} + \beta_7 \text{O\_INSDR} + \beta_8 \text{YRD2010} + \beta_9 \text{YRD2009} + \beta_{10} \text{YRD2008} + \beta_{11} \text{YRD2007} + \beta_{12} \text{YRD2006} + \epsilon \]

Where: \( \alpha \) represents the intercept, \( \beta \) the regression coefficients; \( \epsilon \) is an error term. IVOL represents idiosyncratic volatility and is the dependent variable in equation one. PFRM (Tobin’s, \( Q \)) represents firm performance and is the dependent variable in equation two (robustness tests = ROA, ROE). The independent variables in both equations are O\_XHLD, O\_INST, O\_INSDR, representing the total percentage of cross held share holdings, total percentage of institutional and investment company shareholdings, and total percentage of shares held by employees and other insiders, respectively. There are four control variables, GRW, SZE, LEV and IND representing growth, size, leverage and industry respectively, plus five dichotomous variables in the form of five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. (See, Table 3.2 for a description of the variables).

Equations three and four below are also constructed for pooled data analyses (2006-2011). However, both of these include board characteristics along with ownership structure, to test for the relationship between idiosyncratic volatility and corporate
governance (equation 3), and also a relationship between firm performance and corporate governance (equation 4). Both of these models are shown below as equations three and four.

**Equation 3 – Idiosyncratic Volatility, Ownership and Board Characteristics**

\[ \text{IVOL} = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O}_X \text{HLD} + \beta_6 \text{O}_X \text{INST} + \beta_7 \text{O}_X \text{INSDR} + \beta_8 \text{VP}_B \text{H} + \beta_9 \text{B}_N \text{EDS} + \beta_{10} \text{B}_G \text{D} + \beta_{11} \text{B}_A \text{FF} + \beta_{12} \text{B}_S \text{ZE} + \beta_{13} \text{CGSCR} + \beta_{14} \text{YRD2010} + \beta_{15} \text{YRD2009} + \beta_{16} \text{YRD2008} + \beta_{17} \text{YRD2007} + \beta_{18} \text{YRD2006} + \epsilon \]

**Equation 4 – Performance, Ownership and Board Characteristics**

\[ \text{PFRM} = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O}_X \text{HLD} + \beta_6 \text{O}_X \text{INST} + \beta_7 \text{O}_X \text{INSDR} + \beta_8 \text{VP}_B \text{H} + \beta_9 \text{B}_N \text{EDS} + \beta_{10} \text{B}_G \text{D} + \beta_{11} \text{B}_A \text{FF} + \beta_{12} \text{B}_S \text{ZE} + \beta_{13} \text{CGSCR} + \beta_{14} \text{YRD2010} + \beta_{15} \text{YRD2009} + \beta_{16} \text{YRD2008} + \beta_{17} \text{YRD2007} + \beta_{18} \text{YRD2006} + \epsilon \]

Where: \( \alpha \) represents the intercept, \( \beta \) the regression coefficients; \( \epsilon \) is an error term. IVOL represents idiosyncratic volatility and is the dependent variable in equation three. PFRM (Tobin’s, \( Q \)) represents firm performance and is the dependent variable in equation four (robustness tests = ROA, ROE). The independent variables in both equations are \( O_X \text{HLD}, O_X \text{INST}, O_X \text{INSDR}, \) as described above for equations one and two, plus, \( \text{VP}_B \text{H}, \text{B}_N \text{EDS}, \text{B}_G \text{D}, \text{B}_A \text{FF}, \text{B}_S \text{ZE}, \text{CGSCR}, \) representing the percentage voting power of the single biggest blockholder, the percentage of non-executive directors on the board, percentage of women on the board, the average number of other corporate affiliations for board members, board size and a corporate governance score respectively. There are four control variables, GRW, SZE and LEV and IND, as previously described. There are five year dummy dichotomous variables, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. All of these variables are described in Table 3.2.

**3.9.2. Pooled 2SLS Regressions (instrumental variables approach)**

As discussed earlier, corporate governance variables are sometimes endogenous (see, Hess et al. 2010; Pham et al. 2011 and 2012). For instance, Hess et al. (2010) employed both OLS and 2SLS regressions models to control for potential endogenous relationships between ownership and firm performance, in particular, between ownership concentration and Tobin’s \( Q \), and also between private blockholdings and Tobin’s \( Q \).
Therefore, to control for potential endogeneity of the variables, the 2SLS, instrumental variables approach is used, and a test for endogeneity is conducted.

Following Hess et al. (2010), where both ownership concentration and private blockholdings were treated as endogenous – the variable identified in the current study with the greatest potential of an endogenous relationship with the dependent variable, in each case – is the voting rights/voting power of the single biggest blockholder (VP_BH). Due to the one-share one-vote rule of the Australian market, this variable also represents a large blockholding, and therefore concentrated ownership, and potentially large controlling ownership. The data for this study shows that the percentage voting rights/voting power of the single biggest blockholder can be quite substantial at over 65% in some instances. Therefore this variable has the potential to have an endogenous relationship with both idiosyncratic volatility and firm performance. The variable will be tested, and if there is no a problem with endogeneity, then both the OLS and 2SLS estimations will be consistent. However, if this variable is found to be endogenous, then the 2SLS estimate will be the correct and consistent estimate, and not the OLS (see a description of the regression models and the endogeneity test in Section 3.8).

The 2SLS models employed in this study are specified in equations five and six. Equation five models an analysis of the relationship between idiosyncratic volatility and corporate governance, using selected ownership, ownership structure and board structure and composition variables. The model specified in equation six tests for the relationship between firm performance and corporate governance. The equation specifications, including instrument specifications, for the 2SLS regression models are shown below as equations five and six.

As noted earlier, idiosyncratic volatility (IVOL) is the primary dependent variable, and is used for Research Question 1. Performance (PFRM) is the secondary dependent variable, of which Tobin’s Q (TBNQ) is the main measure of performance. Therefore, Tobin’s Q (TBNQ) is used for Research Question 2, while both ROA and ROE are run for the purpose of robustness.

**Equation 5 – Idiosyncratic Volatility, Ownership and Board Characteristics**

\[
IVOL = \alpha + \beta_1 GRW + \beta_2 SZE + \beta_3 LEV + \beta_4 IND + \beta_5 O_INST + \beta_6 O_INSDR + \beta_7 VP_BH \\
+ \beta_8 B_NEDS + \beta_9 B_GD + \beta_{10} B_AFF + \beta_{11} B_SZE + \beta_{12} CGSCR + \beta_{13} YRD2010 + \\
\beta_{14} YRD2009 + \beta_{15} YRD2008 + \beta_{16} YRD2007 + \beta_{17} YRD2006 + \varepsilon
\]
Equation 6 – Performance, Ownership and Board Characteristics

\[ \text{PFRM} = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O_INST} + \beta_6 \text{O_INSDR} + \beta_7 \text{VP_BH} + \beta_8 \text{B_NEDS} + \beta_9 \text{B_GD} + \beta_{10} \text{B_AFF} + \beta_{11} \text{B_SZE} + \beta_{12} \text{CGSCR} + \beta_{13} \text{YRD2010} + \beta_{14} \text{YRD2009} + \beta_{15} \text{YRD2008} + \beta_{16} \text{YRD2007} + \beta_{17} \text{YRD2006} + \epsilon \]

Where: \( \alpha \) represents the intercept, \( \beta \) the regression coefficients; \( \epsilon \) is an error term. IVOL represents idiosyncratic volatility and is the dependent variable in the equation five. PFRM (Tobin’s, \( Q \)) represents firm performance and is the dependent variable in equation six (robustness tests = ROA, ROE). The independent variables in both equations are O_INST, O_INSDR, plus VP_BH, B_NEDS, B_GD, B_AFF, B_SZE, CGSCR, as described previously as for equations three and four. There are four control variables, GRW, SZE, LEV and IND, and five year dummy dichotomous variables, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006 as previously described. Note that one of the year dummies was dropped to avoid the dummy variable trap (see, Gujarati, 1995). All of the variables are described in Table .3.2.

In estimating the 2SLS regression equation – the voting rights/voting power of the single biggest blockholder (VP_BH) is treated as a suspected endogenous variable in both equations five and six. Hence, this variable remains in the regression equation but is not included in the list of instrumental variables. The variables representing cross-held shares (O_XHLD) is dropped from the regression equation but include in the list of instrumental variables. This is done to fulfil the required order specification of the list of instruments for the 2SLS model.

The list of instrumental variables used in both regression models (defined by equations five and six) is as follows:


3.9.3. Annual OLS Regressions

Equations seven, eight, nine and ten represent the annual data regression models. The regression model specified in equation seven tests for a relationship between idiosyncratic volatility and corporate governance, specifically ownership structure, while the model specified in equation eight tests for a relationship between firm performance and ownership structure.

The relationship between idiosyncratic volatility and corporate governance, in particular, ownership structure and board characteristics, is modelled and specified in equation nine. While equation 10 specifies the modelling to test the relationship between
firm performance, Tobin’s $Q$ (TBNQ) and corporate governance variables, in the form of ownership and board characteristics.

**Equation 7 – Idiosyncratic Volatility and Ownership Structure**

\[
\text{IVOL} = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O_XHLD} + \beta_6 \text{O_INST} + \\
\beta_7 \text{O_INSDR} + \varepsilon
\]

**Equation 8 – Performance and Ownership Structure**

\[
\text{PFRM} = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O_XHLD} + \beta_6 \text{O_INST} + \\
\beta_7 \text{O_INSDR} + \varepsilon
\]

Where: $\alpha$ represents the intercept, $\beta$ the regression coefficients; $\varepsilon$ is an error term. IVOL represents idiosyncratic volatility and is the dependent variable in equation seven. PFRM (Tobin’s, $Q$) represents firm performance and is the dependent variable in equation eight (robustness tests = ROA, ROE). The independent variables in equations seven and eight are $\text{O_XHLD}$, $\text{O_INST}$, $\text{O_INSDR}$. There are four control variables, GRW, SZE, LEV and IND. All of these variables are previously described and explained in the description of the variables, Table 3.2.

**Equation 9 – Idiosyncratic Volatility, Ownership and Board Characteristics**

\[
\text{IVOL} = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O_XHLD} + \beta_6 \text{O_INST} + \\
\beta_7 \text{O_INSDR} + \beta_8 \text{VP_BH} + \beta_9 \text{B_NEDS} + \beta_{10} \text{B_GD} + \beta_{11} \text{B_AFF} + \beta_{12} \text{B_SZE} + \\
\beta_{13} \text{CGSCR} + \varepsilon
\]

**Equation 10 – Performance, Ownership and Board Characteristics**

\[
\text{PFRM} = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O_XHLD} + \beta_6 \text{O_INST} + \\
\beta_7 \text{O_INSDR} + \beta_8 \text{VP_BH} + \beta_9 \text{B_NEDS} + \beta_{10} \text{B_GD} + \beta_{11} \text{B_AFF} + \beta_{12} \text{B_SZE} + \\
\beta_{13} \text{CGSCR} + \varepsilon
\]

Where: $\alpha$ represents the intercept, $\beta$ the regression coefficients; $\varepsilon$ is an error term. IVOL represents idiosyncratic volatility and is the dependent variable in equation nine. PFRM (Tobin’s, $Q$) represents firm performance and is the dependent variable in equation ten (robustness tests = ROA, ROE). The independent variables in both equations are $\text{O_XHLD}$, $\text{O_INST}$, $\text{O_INSDR}$, $\text{VP_BH}$, $\text{B_NEDS}$, $\text{B_GD}$, $\text{B_AFF}$, $\text{B_SZE}$, $\text{CGSCR}$. And, four control variables, GRW, SZE and LEV and IND. All of these variables are described previously and also in Table 3.2.
3.10. Data Selection and Description of the Variables

3.10.1. Data Selection

The data used for this study is taken from the ASX300, the top 300 firms listed on the Australian Securities Exchange for the years 2006-2011. However, banks and utility firms are excluded from the dataset due to their unique characteristics (see for example, Kiel and Nicholson, 2003; Pham et al. 2011 and 2012), and regulatory aspects (Nicholson and Kiel, 2007). For instance, Kiel and Nicholson (2003) discuss that they excluded financial institutions from their study because the recorded assets of banks consists of loans that represent the use of depositors’ funds. Nicholson and Kiel (2007) point out that the utilities industry is highly regulated. Therefore, each year the total number of firms in the analysis is around 300, less financial institutions and utilities companies, and less firms with insufficient data.

3.10.1.1. Data Sample

In this section the data sample that is applied in the study is discussed. The representative sample used in the study is based on the ASX300. As discussed in the following paragraphs, the ASX300 index is applied in this study firstly, because disclosure requirements and practices for firms in the ASX300 are more robust, whereby, there is more likely to be overall good disclosure and flow of corporate governance information. Secondly, because the ASX300 contains predominately larger size firms and some of the variables in the study apply more so to relatively larger firms. Thirdly, the data sample is limited to the ASX300 index to avoid any potential issues and biases that could arise from the inclusion of small-cap stocks in the analyses. Fourthly, the use of a representative sample, applying the constituents of an index is a common application in corporate governance literature.

Firms in an index such as the ASX300 form the basis of many investment portfolios and large investment funds, and are therefore closely followed by analysts, fund managers and investors who require timely and complete information for investment decision making. As discussed in Section 2.3.9.1 of the literature review, although the various corporate governance guidelines and recommendations in the Australian market are largely voluntary, firms in the ASX300 are required to have an audit committee, and to also adhere to ASX Listing Rule 12.7 in accordance with the recommendations set out under the ASX Corporate Governance Principles and Recommendations (ASX, 2012; Christensen et al. 2010; Conway, 2012). This requires the disclosure of various aspects in relation to audit committees. Furthermore, compliance with these requirements has a flow-on effect
of improving the flow of corporate governance information in general, and overall
disclosure by firms in the ASX300 (see, Conway, 2012). This provides greater availability
of important information for decision making and research.

In the current study, with its focus on the relationship between idiosyncratic risk
and corporate governance, the uniqueness of the Australian market, and the unique set of
corporate governance variables, it is important to focus the analysis on a representative
group of firms. This provides a basis for better comparability of the variables, analysis and
interpretation of results, and the formation of conclusions (for related discussion, see, Yen,
2005). This is because relatively larger size firms often have different structures and
characteristics to small firms. For example, small firms are less likely to have large
institutional shareholdings as part of their ownership structure, compared to firms in the
ASX300. Therefore, as ownership structure is a key aspect of this study, and institutional
ownership is a key variable, it is important to focus on a more relevant and representative
sample of firms to meaningfully analyse the various corporate governance variables and the
relationship between both idiosyncratic volatility and corporate governance, and firm
performance and corporate governance.

Another example of differences between small firms and relatively larger firms is
that small firms are found to contain relatively high levels of idiosyncratic volatility
compared to larger firms (see, Malkiel and Xu, 1997). Therefore, the inclusion of small-
cap stocks in the analysis may lead to anomalies and bias the results (for related discussion,
see, Dou, Gallagher, and Schneider. 2012; Yen, 2005). Therefore, the data sample for this
study is limited to firms in the ASX300 to avoid any potential problems, anomalies, or
biases that could arise with the inclusion of small-cap stocks in the study (see for example,
and related discussion, Dou et al. 2012; Yen, 2005).

In addition, it is common in corporate governance literature use of a representative
sample, applying the constituents of an index (see for example, Anderson et al. 2004;
Anderson and Reeb, 2003; Beekes and Brown, 2006; Subramaniam, McManus and Zhang,
2009).

3.10.1.2. Sample Years

The sample years 2006 to 2011 are applied to the study as the overall availability
of data in those years provided the required number of observations for the study and for
robust analyses. Even though the initial release of the ASX Corporate Governance
Principles and Recommendations was in 2003, some of the corporate governance data prior
to 2006 was scant, reducing the number of observations below required levels.

As discussed, there has been greater overall disclosure, and flow of corporate
governance information by firms in the ASX300 since the initial release of the ASX
Corporate Governance Principles and Recommendations in 2003 (see, ASX, 2012; Christensen et al. 2010; Conway, 2012). This is largely due to the requirement of these firms to adhere to ASX Listing Rule 12.7 relating to specific information on audit committees, and the flow-on effect that this requirement has had in ultimately improving the flow of corporate governance information in general, and disclosure overall (see, Conway, 2012).

An analysis was conducted on the availability of data for the development of the variables, including the unique corporate governance variables required for the study. There was found to be sufficient data for the complete data set for the years 2006 to 2011. Prior to 2006 there were not enough data points for some of the corporate governance variables. Therefore, the current study is based on firms listed on the ASX300, encompassing the years 2006 to 2011.

Daily price data was firstly collected and used to determine holding period returns for variance, standard deviation, beta and idiosyncratic volatility calculations. Market and accounting based data was collected for the development of various performance measures, control and dichotomous variables. While ownership structure, board composition and all other corporate governance related data was collected for the development of the main explanatory variables. The data for this study is either end of financial year data, or has a cut-off point at the end of the financial year, 30th June, each year for all years. All of the data was downloaded from DataStream.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>270</td>
</tr>
<tr>
<td>2010</td>
<td>260</td>
</tr>
<tr>
<td>2009</td>
<td>253</td>
</tr>
<tr>
<td>2008</td>
<td>250</td>
</tr>
<tr>
<td>2007</td>
<td>245</td>
</tr>
<tr>
<td>2006</td>
<td>229</td>
</tr>
<tr>
<td><strong>Total firm observations</strong></td>
<td><strong>1507</strong></td>
</tr>
</tbody>
</table>

The number of observations for both the pooled and annual regressions is reduced further, depending on each company’s availability of data for each of the various variables specified in the estimation equations. This is discussed further in the presentation and analysis of results in Chapter 4.
3.11. Description of the Variables

3.11.1. Dependent Variables

The relationship between idiosyncratic risk and corporate governance is the primary focus of this study. Idiosyncratic volatility (IVOL) is the primary dependent variable, and is used for Research Question 1. The required measures for the development of this variable were determined on two years prior daily holding period returns. Previous studies have determined idiosyncratic volatility using both daily and monthly data and returns (see for example, Bali et al. 2005), and over a number of years of prior returns, ranging from two to five years (see for example, Drew et al. 2004). The quality of results is reported to be very similar (see for example, Bali et al. 2005; Drew et al. 2004).

The relationship between firm performance and corporate governance is a secondary focus of the study. The secondary dependent variable is performance (PFRM). This variable has one measure, the Chung and Pruitt model of Tobin’s Q (Chung and Pruitt, 1994). Of the measures, Tobin’s Q, is the primary measure of performance, and is used for Research Question 2. In addition, ROA and ROE are used for robustness tests and reported in Appendix 1. End of financial year data for the development of the dependent variables was downloaded from DataStream. The primary dependent variables are described and discussed below, and shown in Table 3.2.

*Idiosyncratic Volatility (IVOL)*

There are a number of ways shown in the literature to estimate idiosyncratic volatility. However, the various measures fall into two main categories, the direct method and indirect method. Both of these methods are described fully in Appendix 2. The indirect method of estimating idiosyncratic volatility is the method employed in this study. This method is depicted in equation 11 and described below.

*The Indirect Method*

This approach uses the market model where idiosyncratic return is determined as the difference between the stock return and market return (see, Drew et al. 2004; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997). Although there are variations to this approach, the fundamental process is the same, whereby, the idiosyncratic risk component for a stock is estimated as the difference between the total risk of the stock, and the systematic risk component of the stock (see, Drew et al. 2004; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997).
The measure of idiosyncratic volatility is computed as the total risk of a stock (i.e., variance of returns for that stock), minus the systematic risk component for that stock. The systematic risk component of the stock is calculated as the variance of the market index multiplied by the stock’s beta. For this approach to be used, the variance of the stock needs to be determined along with the variance of the market index (see, Drew et al. 2004). The process for determining idiosyncratic volatility for a stock, using this method, is as follows:

- Firstly, compute the variance of returns for each individual stock in the sample. The variance of returns for each stock is taken as the total risk of that particular stock;
- Secondly, beta is estimated for each individual stock using the covariance/variance method, where the covariance of a stock’s return and the market return (the market index), is divided by the variance or the market (market index);
- Systematic risk for a stock is then taken as the beta of that stock multiplied by the variance of the market index;
- Finally, idiosyncratic volatility for an individual stock will be defined as the total risk of the stock minus the systematic risk of that stock.

The estimation of idiosyncratic volatility for stock $i$ using the indirect method can be shown as:

\[
V_{ido} = V_{tot} - V_{sys} = \sigma_i^2 - (\beta_i \sigma_m^2)
\]

Where:

- $V_{ido}$ = the measure of idiosyncratic volatility for a particular stock (stock $i$).
- $V_{tot}$ = the total volatility of a stock, which is the variance of returns for a particular stock (stock $i$), also shown here as $\sigma_i^2$.
- $V_{sys}$ = the systematic risk component of a particular stock (stock $i$), which is the variance of the market index, multiplied by the beta of a particular stock (stock $i$), also shown here as $(\beta_i \sigma_m^2)$.

Therefore using the indirect method, idiosyncratic volatility can be determined as the total variance of returns for stock $i$, minus, the beta of stock $i$ multiplied by the variance of the market index, as shown in Equation 11 above. Due to limitations of the Australian dataset, this method of estimating idiosyncratic volatility is an appropriate method for this study (see for example, Dempsey et al. 2001). Therefore the indirect method is employed in this study. In addition, the idiosyncratic volatility measure is standardised for greater functionality and comparability, by taking the square root of the measure.
**Firm Performance (PFRM)**

The other dependent variable in this study is Performance (PFRM). This variable is represented by Tobin’s $Q$, is the primary measure of performance, and is used for Research Question 2. In addition, ROA and ROE are used for robustness tests and reported in Appendix 1. Of the measures, Tobin’s $Q$, is the primary measure of performance, and is used for Research Question 2.

Tobin’s $Q$ is the most favoured and commonly used in the literature (see for example, Black and Kim, 2012; Chen, Cheng, and Hite, 1986; Cho, 1998; Claessens and Djankov, 1999; Claessens et al. 2000; DaDalt, Donaldson, and Garner, 2003; Hermelin and Weisbach, 1988; Hess et al. 2010; Himmelberg, Hubbard, and Palia, 1999; Holderness, Kroszner, and Sheehan, 1999; Loderer and Martin, 1997; Martínez et al. 2007; McConnell and Servaes, 1990; Mórcz et al. 1988; Shepherd, 1986, and others). Therefore Tobin’s $Q$ is the primary measure of performance of this study, and is used for Research 2. Further, of all the measures of Tobin’s $Q$, the Chung and Pruitt model is often considered the most robust, even though it is not as complicated as other Tobin’s $Q$ ratios (for further discussion see, DaDalt et al. 2003). Therefore, the Chung and Pruitt model of Tobin’s $Q$ (Chung and Pruitt, 1994), is employed in this study. The Chung and Pruitt model of Tobin’s $Q$ is shown below:

**Equation 12 – Tobin’s $Q$ - Chung and Pruitt model**

$$
\text{Tobin’s } Q = \frac{(MV + LTL + INVT + TCL – TCA)}{TA}
$$

*Where:*

- $MV$ = the market value of common equity
- $LTL$ = long-term liabilities
- $INVT$ = inventories
- $TCL$ = total current liabilities
- $TCA$ = total current assets
- $TA$ = total assets

Although the denominator of Tobin’s $Q$ is a book value measure, the numerator is made up of current and long-term book value and market value measures – Tobin’s $Q$ is considered a market based measure of performance and value creation, with a forward looking perspective of what the firm is expected to achieve. The higher the Tobin’s $Q$, the better the current and future potential market value and performance of the firm, and potential return from its assets.
Additionally, ROA and ROE are the most commonly used accounting measures of performance in this literature (see for example, Bozec and Laurin, 2007; Chen et al. 2005; Klapper and Love, 2004; Martínez et al. 2007; Maury, 2006; Rutherford, Kuratko, and Holt, 2008; Wang, 2002), and is applied in this study for the purpose of robustness tests. As both ROA and ROE are accounting based measures, as such, they are retrospective in nature. Nevertheless, both ROA and ROE are also considered indicators of current and future performance potential where, the higher the ROA and/or ROE of the firm, the better the current and future potential performance of that firm and, the potentially higher future equity prices (see for example, Claessens and Djankov, 1999). Thus, both ROA and ROE are run as robustness tests, the results are reported in Appendix 1.

3.11.2. Independent Variables

The independent variables comprise of three ownership structure variables; one concentrated voting power/ownership variable; four board structure and composition variables; and a corporate governance score. In addition to these independent variables, the study includes four control variables and five dichotomous dummy variables.

The ownership variables include the total percentage cross-held shares (O_XHLD), total percentage institutional held shares (O_INST), and total percentage of shares held by insiders (O_INSTDR), plus the percentage voting rights/voting power of the single biggest blockholder (VP_BH). The board structure variables are made up of the percentage of non-executive directors (B_NEDS), the percentage of women on the board (B_GD), the average number of other corporate affiliations among the board members (B_AFF), and board size (B_SZE). There is also a DataStream corporate governance score (CGSCR). The four control variables are growth (GRW), firm size (SZE), leverage (LEV), and industry (IND). The five dichotomous variables are five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. Note that there are six dummy variables; however, one of the year dummies is dropped from the pooled regressions to avoid the dummy variable trap (see, Gujarati, 1995). Although some of the regression equations include all of the independent variables discussed above, not all of the variables are used in all of the regressions equations. All of these variables are described in Table 3.2.
Ownership and Ownership Structure

Cross-held Shares ($O_{XHLD}$)

This variable represents the percentage of a firm’s total shares on issue that are held by another company. A cross-holding is an equity holding whereby one company has an equity holding in another company. Cross-holdings can create a stronghold of control, whereby groups of individual companies own interconnected holdings in each other (see, Denis and McConnell, 2003). This intertwining of ownership and control creates a supportive environment where alliances are formed for the purpose of additional voting power and control (Denis and McConnell, 2003).

Therefore, disproportionate control can be achieved through cross-holdings (see for example, Claessens et al. 2000; Denis and McConnell, 2003; Faccio and Lang, 2002; La Porta et al. 1999). Moreover, cross-holdings may provide protection against hostile takeover (Wenger and Kaserer, 1998), most likely provided through interconnected ownership strongholds, supporting and strengthening the company’s position (Denis and McConnell, 2003). As discussed earlier, this situation may be part of the reason why the Australian listed market was described by Dignam and Galanis (2004) as having a weak market for corporate control. Pham et al. (2011 and 2012) argue that the market for corporate control in Australia is still not strong, and is neither as active nor effective as it is in US and UK markets.

The Australian market is a market with internal-governance-control characteristics. Hence, it does not rely heavily on the external market for corporate control. Further, cross-holdings are likely to be large shareholdings, and it is found that concentrated equity ownership, up to an optimal point for a firm, has a positive impact on firm value and performance (see for example, Barclay and Holderness, 2012; Gorton and Schmid, 2000; Mörck et al. 1995; Sarkar and Sarkar, 2003; Thomsen and Pedersen, 2000). Furthermore, it is suggested that it is not only the effects of concentrated ownership, but also the expertise and skills that large shareholders bring to the firm that impacts positively on firm performance (see, Barclay and Holderness, 2012).

It is likely that the internal-governance-control system that the Australian market operates within is able to cope with the presence of large cross-holdings. Hence, rather than creating a problem, the stability, expertise and skills, that large cross-holdings can bring to a firm is more likely to impact positively (see, Barclay and Holderness, 2012). Therefore it is predicted that cross-holdings will be positively correlated with firm performance. It is also predicted that this variable that will be positively correlated with idiosyncratic risk due to the various risks associated with large controlling cross-holdings, and the constant awareness of potential problems with this form of ownership, particularly
in the case of disproportionately large and influential consolidated cross-holdings (see for example, Claessens et al. 2000; Denis and McConnell, 2003; Ramsay and Stapledon, 2001). A description of this variable is contained in Table 3.2.

*Institutional Equity Holdings* (O_INST)

This variable represents the percentage of total shares on issue held as long-term strategic holdings by institutions seeking a long-term return. It is suggested that institutional equity ownership is associated with rising trends in idiosyncratic volatility and better corporate governance (see for example, Campbell *et al.* 2001; Durnev *et al.* 2004; Ferreira and Laux, 2007). In addition, it is suggested that a clientele effect exists with regard to institutional ownership, whereby institutional investors choose to invest in firms according to a firm’s existing governance policies and practices (see for example, Bushee *et al.* 2009; Bushee and Noe, 2000; Hartzell and Starks, 2003). Moreover, when these institutional investors become established as a substantial part of the firm’s overall ownership structure, they tend to take on an active role to further improve governance practices and outcomes for the firm and the other shareholders (see for example, Ackert and Athanassakos, 2001; Bushee *et al.* 2009; Hartzell and Starks, 2003). However, this is not the case in all markets. For instance, in the Australian market, institutional investors are typically not as proactive in corporate governance matters, compared to those in the US (see, Stapledon, 2011).

Results are mixed in the literature with regard to the positive effects of institutional equity ownership on firm-level corporate governance and performance. Some studies find institution holdings impact positively on the firm (see for example, Agrawal and Mandelker, 1990; Ho, 2005; Lehmann and Weigand, 2000), while others find no relationship between institutional equity ownership, corporate governance and firm performance (see for example, Agrawal and Knoeber, 1996; Craswell *et al.* 1997). Results are also mixed on the impact of institutional ownership and levels of idiosyncratic risk. For instance, as discussed above, there is found to be a positive link between institutional ownership and idiosyncratic volatility in US firms (see for example, Campbell *et al.* 2001; Durnev *et al.* 2004; Ferreira and Laux, 2007). However, Pham *et al.* (2012) observed that along with other factors, institutional ownership appeared to have a negative relationship with perceived levels of firm-specific risk. Anderson *et al.* (2003) and Anderson and Reeb (2003) suggest that institutional ownership resembles a well-diversified shareholder, and hence able to reduce levels of risk for the firm. However, the impact of institutional ownership on a firm depends largely on the type of institutional investor (see, Lehmann and Weigand, 2000).
There are quite large institutional investors in Australian listed firms who fit the description of well-diversified shareholders, as described by Anderson et al. (2003) and Anderson and Reeb (2003). In addition, many of the institutional investors in the Australian market represent long-term strategic holdings. This type of institutional ownership may have the effect of reducing real and perceived levels of risk for the firm (see for example, Pham et al. 2011 and 2012). Therefore, it is predicted that institutional ownership is likely to have a negative relationship with idiosyncratic volatility. In addition, it is predicted that institutional ownership will also have a negative relationship with firm performance. This is due to the type of institutional investor represented in this study as described above. Long-term strategic holdings have the potential to be focused on their own needs, goals and requirements hence, this type of ownership is likely to impact negatively on firm value and performance. See Table 3.2, for a description of this variable.

Insider Held Shares (O_INSDR)

This variable represents the percentage of total shares in issue held by insiders. Insiders can be very large, self-serving, and controlling, therefore, the primary purpose of a corporate governance system is to protect minority and outside shareholders from expropriation by self-serving insiders and controlling shareholders (see, La Porta et al. 2000). However, the benefits of better monitoring that comes with insider ownership, particularly large insider ownership, can help to reduce agency problems and to improve firm value and performance (see for example, Agrawal and Knoeber, 1996; Ang et al. 2000; Mórck et al. 1988; Pham et al. 2011 and 2012). The level and impact of increased monitoring depends on the type of firm, the unique characteristics and situation of the firm, and the actual percentage of insider ownership (see for example, McConnell and Servaes, 1990; Mórck et al. 1988; Mórck, 1995; Muller and Warneryd, 2001).

Mórck et al. (1988) found that firm performance typically improves with insider ownership, in particular, management ownership. They suggest that this is due to the alignment of incentives between managers and shareholders. However, when management ownership and control become too great, the positive effects begin to dissipate (Mórck et al. 1988). It is often the case that insiders become entrenched through very large and disproportionate holdings, and this is found to impact negatively on firm performance (see for example, McConnell and Servaes, 1990; McConnell and Servaes, 1995; Mórck et al. 1988). In addition, very large, powerful and disproportionate family ownership can not only impact negatively on the firm, but can also impact negatively on the economy of a country (see, Mórck et al. 2005).

Therefore, based on the literature, there is potential for both positive and negative effects on a firm with greater levels of insider ownership. However, as discussed in the
literature, this depends largely on the size, type, influence and proactiveness of the insiders (see for example, McConnell and Servaes, 1990; Mórck et al. 1988).

In addition, the Australian market is a well-organised market that operates in an internal-governance-control system and therefore ownership structure is an integral aspect of internal-governance-control. Hence, such a market is well equipped to cope with different ownership structures. Therefore, it is predicted that insider ownership will be positively correlated with firm performance, yet negatively correlated with idiosyncratic volatility. This is due to the risk reduction effects of increased monitoring, and alignment of management and shareholder interests that comes with greater insider ownership. Moreover, this leads to a reduction in agency problems and costs (Agrawal and Knoeber, 1996; Ang et al. 2000; Mórck et al. 1988; Pham et al. 2011 and 2012). See Chapter 2, Section 2.3.5 for more discussion on ownership structure. See Table 3.2, for a description of this variable.

Voting Power of the Single Biggest Blockholder (VP_BH)

This variable represents the percentage voting rights (by voting power) of the single biggest shareholder. In addition, due to the one-share one-vote rule of the Australian listed market this variable also represents the percentage size single biggest shareholder relative to a firm’s total equity.

Blockholders have good reason to monitor management actions and decision making, and the power to influence outcomes (see, Denis and McConnell, 2003). However, the influence of blockholders is not always in the best interests of the firm’s minority shareholders. It all depends on whether, or not, the influence of blockholders on management works for the overall good of the firm and all the shareholders (see, Denis and McConnell, 2003). Therefore, although the presence of powerful, controlling blockholders has the potential to impact negatively on the firm, it may well be offset by the positive effects that blockholders can bring to the firm. These benefits include better monitoring, enhanced protection of minority shareholders, and a greater level of expertise and skill. All of these factors can have a positive impact on firm value and performance (see for example, Gorton and Schmid, 2000; Mórck et al. 1988; Sarkar and Sarkar, 2003; Thomsen and Pedersen, 2000). Therefore, impact of concentrated equity ownership on firm-level corporate governance, firm value and performance, depends largely on a number of factors including the type of holding, who the blockholder is, the degree of ownership concentration, and the balanced and considered use of power and control (see, Denis and McConnell, 2003).

There are a substantial number of Australian firms with large controlling blockholders (see for example, Lamba and Stapledon, 2001). It is likely that these large
equity holdings will serve to increase the idiosyncratic riskiness of those firms, due to the constant risk that power and control will be misused. However, at the same time, the Australian market operates in an internal-governance-control system where ownership structure is an important element of corporate governance. In addition, large blockholdings have been a part of Australian firms for many years (see for example, Dignam and Galanis, 2004). Hence, rather than posing a problem, this type of equity ownership is likely to impact positively on firm performance (see for example, Barclay and Holderness, 2012; Lamba and Stapledon, 2001), as benefits of control and power are shared (see, Denis and McConnell, 2003). Therefore, it is predicted that the voting power of the single biggest blockholder will be positively correlated with idiosyncratic volatility, and also positively correlated with firm performance. See a description of this variable in Table 3.2.

Board Structure and Composition Variables

Non-executive Directors (B_NEDS)

This variable represents the percentage of non-executive board members. It is suggested that there needs to be a good balance of executive and non-executive directors on a corporate board that is optimal for a particular firm (Hampel Committee, 1998). Non-executive directors can provide a degree if impartially between executive directors and shareholders, and can also help in the alignment of interests between executives and shareholders (see, Pass, 2004). The Cadbury Committee’s ‘Code of Best Practice’ recommends that, at the very least, corporate boards should contain three non-executive directors, so that their influence has some impact at board meetings (Cadbury, 1992). It is suggested that the ideal scenario is for a majority of independent directors on a corporate board to provide an environment for objective advice and decision making (see, Leeson et al. 2010). Further, including a greater number on non-executive directors on a corporate board is found to lead to better corporate governance (see for example, Pass, 2004; Young, 2000). This is because non-executive directors play a valuable role in making executive directors more accountable for their decisions, actions, policies and practices, and for ensuring independent and unbiased judgements on important issues concerning the company and the shareholders (see, Chen and Jaggi, 2001; Leeson et al. 2010; Pass, 2004).

Evidence is mixed in the literature on the relationship between board independence and firm performance. A number of studies have found no convincing evidence that including a greater number of independent non-executive directors on the board improves firm performance (see for example, Bhagat and Bernard, 2002; Hermalin and Weisbach, 1991). Agrawal and Knoeber (1996) found that outside directors can have a negative effect
on firm performance. However, other studies have found that board independence has a positive impact on firm performance. Moreover, the inclusion of independent directors to a corporate board is central to good corporate governance (see for example, Black and Kim, 2012; Bois et al. 2009; Coles et al. 2008; Fazlzadeh et al. 2011; Uzun et al. 2004).

As discussed above, the presence of non-executive directors on a corporate board can help in the alignment of interests between executives and shareholders, while also providing a degree of objectivity and impartiality to board decision making, actions, and judgments (see for example, Chen and Jaggi, 2001; Leeson et al. 2010; Pass, 2004). All of these aspects should serve to reduce the risks associated with poor decision making and judgments. Therefore, it is predicted that there will be a negative correlation between idiosyncratic volatility and the percentage of non-executive directors on a corporate board. In addition, it would be expected that a greater number of non-executive directors on a corporate board would lead to better firm performance, due to better corporate governance. However, as evidence is mixed in the literature, the predicted sign in this case could be either negative or positive. See Table 3.2, for a description of this variable.

**Gender Diversity (B_GD)**

This variable represents the total percentage of women on the board. Levi, et al. (2013) suggest that male and female directors have a tendency to approach decision making differently, in that female directors will tend be more cautious than their male counterparts. In addition, female directors will often have a different outlook on issues and expected outcomes, which also has a bearing on decision making (see for example, Barber and Odean, 2001; Burke, 2003).

Some of the positive impacts for firms with gender diverse boards include better monitoring, more committed board attendance, and a greater instance of compensation based on firm performance (see, Adams and Ferreira, 2009a). Gender diversity can provide a different outlook on the many issues that a board faces, and has the potential to improve decision making quality (see for example, Adams and Ferreira, 2009a; Erhardt, Werbel, and Shrader, 2003; van der Walt and Ingley, 2003). However, although there are a number of positives for gender diversity, Adams and Ferreira (2009a) found that on average, there was a negative relationship between greater gender diversity on boards and firm performance. In addition, Adams and Ferreira (2009a) found that insisting that firms fill gender quotas on their boards has a negative impact on firm value. This is particularly so when the board is already functioning efficiently and effectively.
It is predicted that the total percentage of women on a board will be negatively correlated with idiosyncratic volatility, because female directors are likely to be more cautious in their decision making and actions compared to their male counterparts (see for example, Barber and Odean, 2001; Burke, 2003; Levi et al. 2013). However, as discussed above, due to the pressure that some companies find themselves in trying to fill gender quotas (Adams and Ferreira, 2009a), it is predicted that gender diversity will be negatively correlated with firm performance. See Table 3.2, for a description of the variable.

**Board Affiliations (B_AFF)**

This variable represents the average number of other corporate affiliations among the board members. The literature indicates that board business can send a negative signal to the market, in that the market perceives that directors with multiple directorships and other corporate affiliations are too busy to fulfil their duties as directors, and this impacts negatively on firm value (see, Haniffa and Hudaib, 2006). Corporate boards that are too busy with a high average number of outside affiliations among the members are faced with a number of potential problems. These problems can include, less effective monitoring of management, weaker corporate governance, higher agency costs, and ultimately poor performance (see for example, Core et al. 1999; Fich and Shivdasani, 2006; Haniffa and Hudaib, 2006). Further, it is suggested that a director who holds three or more directorships is considered to be too busy. Alternatively, if they are a retired director, the number is 6 or more (see, Core et al. 1999).

On the other hand, it is suggested that outside corporate affiliations can have a positive signalling effect for the firm with regard to the level of experience and expertise of the board (see for example, Higgins and Gulati, 2003; Kim and Higgins, 2007). In addition, multiple directorships and affiliations can increase firm visibility, give executives a rapport among piers, and enhance a firm’s ability to develop alliances and win profitable contracts. Outside affiliations can also give a firm greater access to valuable information and resources (see for example, and related discussion, Higgins and Gulati, 2003; Kiel and Nicholson, 2006; Kim and Higgins, 2007).

Therefore, due to greater exposure and increased visibility, plus, greater access to outside resources and information, a higher average number of outside corporate affiliations among the directors, should equate to higher levels of idiosyncratic volatility (see for example, and related discussion, Higgins and Gulati, 2003; Kiel and Nicholson, 2006; Kim and Higgins, 2007). Therefore it is predicted that this variable will be positively correlated with idiosyncratic volatility. In addition, due to the potential for firms with busy boards to develop valuable alliances and to win profitable contracts, it is
predicted that this variable will also be positively correlated with firm performance. This variable is described in Table 3.2.

*Board Size (B_SZE)*

This variable represents the total number of directors on the board. It is suggested that larger boards are more able to monitor the activities of management, yet communication is often poorer with bigger boards (see, Jensen, 1993; Lipton and Lorsch, 1992). Evidence is mixed in the literature on the relationship between board size and firm performance. Some studies have found a negative relationship between board size and firm performance (see for example, Coles *et al.* 2008; Guest, 2009; Hermelin and Weisbach, 1991, 2001; Jegers, 2009; Mak and Kusnadi, 2005; Yermack, 1996), while others report a positive relationship between board size and firm performance (see for example, Adams and Mehran, 2012; Anderson *et al.* 2004; Kiel and Nicholson, 2003; Li and Naughton, 2007). Kiel and Nicholson (2003) found there to be a positive relationship between board size and firm value for Australian firms.

Based on previous findings, relatively larger size firms will be less volatile, in that they will contain lower levels of idiosyncratic volatility compared to smaller firms (see for example, Malkiel and Xu, 1997). Therefore it would be expected that larger firms will have larger boards, hence, board size would also be negatively correlated with idiosyncratic volatility. Further as discussed above, relatively larger size boards may be less communicative (see, Jensen, 1993; Lipton and Lorsch, 1992), and therefore less information flow. Therefore, it is predicted that board size will be negatively correlated with idiosyncratic volatility. Evidence is mixed in the literature on the relationship between board size and firm value and performance. However, considering that Kiel and Nicholson (2003) found a positive relationship between board size and firm value for Australian firms, it predicted that the current study will find a positive relationship between board size and firm performance as measured by Tobin’s $Q$. Therefore it is predicted that board size will be positively correlated with firm performance. This variable is described in Table 3.2.

*CGSCR (Corporate Governance Score)*

This variable represents a DataStream corporate governance score. It is an all encompassing corporate governance score that is largely determined on a transparency score, and is made up of a number of relevant corporate governance indicators. The score measures systems, mechanisms, processes and practices related to the alignment of both board of directors and management interests with the interests of the firm’s shareholders and the goal of shareholder wealth maximisation. Therefore, the score combines
transparency factors with elements related to board structure, board function, compensation policy, shareholder rights, plus, the company’s vision and strategy. The lowest (poorest) score is 0, and the highest (best) score is 100 (DataStream, 2012). A comprehensive description of this variable is contained in Appendix 3.

Ferreira and Laux (2007) employed the Gompers et al. (2003) governance index, which is a corporate governance index constructed from observations on a set of antitakeover-related governance provisions. Ferreira and Laux (2007) found a strong negative relationship between this index and idiosyncratic information flow as measured by idiosyncratic volatility. Linden and Matolcsy (2004) discuss the importance of having good corporate governance policies and practices in place, yet they found no convincing evidence of a relationship between corporate governance scoring and firm performance.

Therefore, since the DataStream corporate governance score is largely determined on a transparency factor, it is predicted that the corporate governance score used in this study will be positively correlated with idiosyncratic volatility. In addition, it would be expected that the corporate governance score should be positively correlated with firm performance. However, since prior research found that corporate governance scoring has little or no impact on firm performance, and that a one-size fits all corporate governance measure may not fully reflect all aspects of corporate governance, the DataStream corporate governance score could be either positively or negatively related to firm performance. See Table 3.2, for a description of this variable.

Control Variables

Control variables are included in a regression model to allow for the established effects that certain variables are likely to have on the dependent variable. Even though including control variables changes the structure of a regression equation, they are necessary to control for the impact of factors such as firm size, industry sector, growth rate and leverage. If important control variables are not included in an analysis, then it could be that results are skewed and possibly driven by obvious and previously established factors not included in the model. Growth, size, leverage and industry are common controls used in empirical studies that involve corporate governance variables and measures of firm performance (see for example, Hutchinson and Gul, 2004).

Growth (GRW)

The growth variable used in this study is determined as year on year growth in net revenue over total assets, and as such, is a measure of a firm’s internal growth rate. The internal growth rate of a firm is a contributing factor to the level of risk unique to a
particular firm. The literature highlights various aspects of a firm’s internal growth rate and factors impacting the growth of a firm, such as the unavoidable uncertainty and risk associated with growth, and particularly rapid growth (see for example, Garnsey, 1998; Penrose, 1995; Spender, 1996).

Typically, high growth is not a long-term sustainable growth, but is instead a temporary phenomenon associated with uncertainty and risk. Firms with high growth and high but uncertain future growth potential are often firms that have a tendency to greater volatility of returns (Wei and Zhang, 2006). These firms are often associated with growth oriented industries and potentially in volatile environments where they may experience distress risk (Fama and French, 1992; Fama and French, 1998, 2007), greater uncertainty about future growth and therefore greater returns volatility (Pástor and Pietro, 2003).

However, the firms in this study are in the top 300 Australian firms as measured by market capitalisation. Therefore the majority of these firms are large size firms that are likely to be inherently less volatile in nature compared to small size firms (see, Malkiel and Xu, 1997). Therefore growth in this context is expected to be negatively correlated with idiosyncratic volatility, and positively correlated with Tobin’s $Q$. A description of this variable is set out in Table 3.2.

**Firm Size (SZE)**

This variable controls for the size of a firm. Firm size is a contributing factor to the level of firm-specific risk unique to a firm. The literature reveals that over the years relatively smaller firms are typically more volatile and typically produce relatively better returns than do larger firms (see for example, Fama and French, 1992 and 1995; Malkiel and Xu, 1997; Roll, 1981). Dempsey (2002) suggests that small firms with high levels of idiosyncratic volatility tend to perform well. However, it is often the firms with the higher levels of idiosyncratic volatility that are the superior performers in terms of market valuation and returns to investors (see also, for example, Dempsey et al. 2001; Malkiel and Xu, 1997). Relatively smaller size firms are also found to be better performers in terms of firm performance as measured by Tobin’s $Q$, in that firm size is found to be negatively correlated with Tobin’s $Q$ (see for example, Hess et al. 2010; Lang and Stulz, 1993). Therefore, it is predicted that size will be negatively correlated with both firm performance and idiosyncratic volatility. A description of the size variable is set out in Table 3.2.

**Leverage (LEV)**

Leverage is considered necessary for the successful operation and running of a firm, and for shareholder wealth maximisation. However, if not managed well, leverage
can dramatically increase the riskiness of the firm and its assets, and can destroy the viability of the firm and shareholder wealth. The degree of leverage that a firm bears is one of the contributing factors to the level of idiosyncratic risk unique to the firm. There is an optimal capital structure, with an optimal mix of debt and equity for a firm. However, beyond that optimal level, leverage has the overall effect of increasing the firm’s cost of financing and risk of financial distress (see for example, Pham et al. 2012). Therefore, even though there is a beneficial level of debt financing for an individual firm, it is predicted that on average for the firms in this study, that relatively higher levels of debt will be positively correlated with idiosyncratic volatility, and negatively correlated with firm performance. The reasoning for this is that higher levels of debt can contribute to real and perceived levels of risk for the average firm (see for example, Pham et al. 2011 and 2012). Further, this has potential to impact negatively on investor sentiment and stakeholder confidence, ultimately generating higher costs, and impacting negatively on firm performance. A description of this variable is set out in Table 3.2.

*Industry (IND)*

This variable controls for the impact of industry sectors (see for example, Core et al. 1999; Core and Larcker, 2002; Hutchinson and Gul, 2004), in that industry sectors may be impacted by economic cycles, competitive factors, risks, and other aspects over time. The variable is comprised of nominal codes representing general industry categories. These include Industrials and Resources, Transportation, Insurance and other financial. As previously discussed, the categories representing Utilities and Banks are excluded from the analyses due to their unique characteristics and regulatory aspects (see for example, Kiel and Nicholson, 2003; Nicholson and Kiel, 2007; Pham et al. 2011 and 2012). The industry variable is described in Table 3.2.

*Dichotomous Variables*

There are six dichotomous variables in the form of six year dummies, YRD2011, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. Dichotomous year dummies for the years 2006 to 2011 are applied to the data, where 1 equals each year represented, and 0 otherwise. For example, in YRD2010, the year 2010 equals 1, otherwise all other years are zero. Note that one dummy variable is dropped from each of the pooled regressions in each instance to avoid the dummy variable trap (see, Gujarati, 1995).

The use of dichotomous variables is an important analytical tool in empirical studies that provides additional insight and comparability. The year dummies developed for the pooled regression analyses for this study provide some insight into the effects of the
GFC (before, after and during that period of time) on the levels of idiosyncratic volatility and the performances of Australian listed firms during that period.

Schwert (1990) reported that stock returns volatility increased dramatically during and immediately following the stock market crash of 1987. However, levels of volatility returned to lower than normal, much quicker than expected relative to past experience. In a study of aggregate idiosyncratic volatility in 23 developed equity markets up to the year 2008, Bekaert (2012) reported that, other than an occasional spike in volatility, there was no evidence of aggregate idiosyncratic volatility trending upwards. Therefore, if the recent global financial crisis has followed a similar pattern in levels of volatility as described above, it is predicted that the year dummies for years 2008, 2009 and 2010 will be positively correlated with idiosyncratic volatility, while the year dummies for 2006 and 2007 will be the most likely years to be positively correlated with firm performance. All of the variables discussed above and described in Table 3.2 below.

Table 3.2 Description of the Variables

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IVOL and PFRM</td>
<td></td>
</tr>
<tr>
<td><strong>Idiosyncratic Volatility</strong></td>
<td></td>
</tr>
<tr>
<td>IVOL</td>
<td>Idiosyncratic Volatility: The square root of ([\text{Total variance of stock } i \text{ minus } (B_i \text{ multiplied by the variance of the market})]) (All of the measures are based on 2 years prior daily holding period returns developed from daily data to end of financial year each year, downloaded from DataStream). See Section 3.11.1, for detail on the method of development of this variable.</td>
</tr>
<tr>
<td><strong>Firm Performance</strong></td>
<td></td>
</tr>
<tr>
<td>All of the data required for the performance variables is based on end of financial year data for the years 2006 to 2011, downloaded from DataStream.</td>
<td></td>
</tr>
<tr>
<td>PFRM: TBNQ</td>
<td>Tobin’s (Q) (Chung and Pruitt): (Market Value of Common Equity + Long-term Liabilities + Inventories + Total Current Liabilities - Total Current Assets) / Total Assets</td>
</tr>
<tr>
<td>ROA</td>
<td>Return on Assets: Net Income / Total Assets (robustness test)</td>
</tr>
<tr>
<td>ROE</td>
<td>Return on Equity: Net Profit/Common Shareholder Equity (robustness test)</td>
</tr>
</tbody>
</table>
**Independent Variables**
The data for the corporate governance variables is derived from DataStream. There are 6 years of data, 2006-2011, taken at the end of each financial year.

<table>
<thead>
<tr>
<th>Ownership/Ownership Structure</th>
<th>Expected Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>O_XHLD</strong> Cross Holdings: The percentage of total shares in issue held by one company in another</td>
<td>+ with IV + with TBNQ</td>
</tr>
<tr>
<td><strong>O_INST</strong> Institutional Held Shares: The percentage of total shares in issue held as long-term strategic holdings by investment banks or institutions seeking a long term return (this variable does not include pension funds)</td>
<td>- with IV - with TBNQ</td>
</tr>
<tr>
<td><strong>O_INSDR</strong> Insider Held Shares: The percentage of total shares on issue held by employees, or by those with a substantial position in a company that provides significant voting power at an annual general meeting (typically family members)</td>
<td>- with IV + with TBNQ</td>
</tr>
<tr>
<td><strong>VP_BH</strong> Single Biggest Blockholder (voting rights/voting power): The percentage voting rights (by voting power) of the single biggest blockholder</td>
<td>+ with IV + with TBNQ</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Board Structure and Composition</th>
<th>Expected Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B_NEDS</strong> Non-executive Board Members: Percentage of non-executive board members</td>
<td>- with IV +/- with TBNQ</td>
</tr>
<tr>
<td><strong>B_GD</strong> Board Gender Diversity: Percentage of women on the Board</td>
<td>- with IV - with TBNQ</td>
</tr>
<tr>
<td><strong>B_AFF</strong> Board Member Affiliations: The average number of other corporate affiliations for board member</td>
<td>+ with IV + with TBNQ</td>
</tr>
<tr>
<td><strong>B_SZE</strong> Board Size: the total number board members at EOFY</td>
<td>- with IV +/- with TBNQ</td>
</tr>
<tr>
<td><strong>CGSCR</strong> Corporate Governance Score: DataStream scores a company's systems and processes to ascertain if its board members and managers act in the best interests of its long-term shareholders</td>
<td>+ with IV +/- with TBNQ</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Variables</th>
<th>Expected Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GRW</strong> Growth: (Net revenue this year – Net revenue last year) / Total Assets</td>
<td>- with IV + with TBNQ</td>
</tr>
<tr>
<td><strong>SZE</strong> Size: Natural Log of Total Assets</td>
<td>- with IV - with TBNQ</td>
</tr>
<tr>
<td><strong>LEV</strong> Leverage: (Long-term debt + Short-term debt) / Total Assets</td>
<td>+ with IV - with PFRM</td>
</tr>
<tr>
<td><strong>IND</strong> Industry: General Industry Classifications which include – <em>Industrials and Resources, Transportation, Insurance, and other financial.</em> Both <em>Utilities and Banks</em> have been omitted by excluding their relevant codes</td>
<td>Nominal codes only</td>
</tr>
</tbody>
</table>
### Dichotomous Variables

Dichotomous year dummies for the years 2006 to 2011 are applied to the data, where 1 equals each year represented and 0 otherwise. For example, in YRD2010, the year 2010 equals 1, otherwise all other years are zero.

Note: one dummy variable is dropped from each of the pooled regressions in each instance to avoid the dummy variable trap (see, Gujarati, 1995).

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
<th>With IV</th>
<th>With TBNQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>YRD2011</td>
<td>Year Dummy for fiscal year 2011</td>
<td>+ with IV</td>
<td>- with TBNQ</td>
</tr>
<tr>
<td>YRD2010</td>
<td>Year Dummy for fiscal year 2010</td>
<td>+ with IV</td>
<td>- with TBNQ</td>
</tr>
<tr>
<td>YRD2009</td>
<td>Year Dummy for fiscal year 2009</td>
<td>+ with IV</td>
<td>- with TBNQ</td>
</tr>
<tr>
<td>YRD2008</td>
<td>Year Dummy for fiscal year 2008</td>
<td>+ with IV</td>
<td>- with TBNQ</td>
</tr>
<tr>
<td>YRD2007</td>
<td>Year Dummy for fiscal year 2007</td>
<td>- with IV</td>
<td>+ with TBNQ</td>
</tr>
<tr>
<td>YRD2006</td>
<td>Year Dummy for fiscal year 2006</td>
<td>- with IV</td>
<td>+ with TBNQ</td>
</tr>
</tbody>
</table>

As noted earlier, the relationship between idiosyncratic risk and corporate governance is the primary focus of this study. Therefore idiosyncratic volatility (IVOL) is the primary dependent variable, and is used for Research Question 1. Considering the performance of the firms is a secondary aspect of the study. Hence, performance (PFRM) is the secondary dependent variable, of which Tobin’s Q (TBNQ) is the main measure of performance. Therefore, Tobin’s Q (TBNQ) is used for Research Question 2, while both ROA and ROE are run for the purpose of robustness tests only.

### 3.12. Summary and Concluding Comments

This chapter has presented the research methodology. The chapter discusses the focus of the study, the aims of the study, the theoretical motivation, and expected findings and outcomes. The research questions are presented and discussed, along with identification and description of the models. The data selection and development and description of the variables are also discussed in this chapter.

The primary focus of the study is on the relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics, and Research Question 1 is based on this. A secondary focus of the study is on the relationship between firm performance (specifically Tobin’s Q) and corporate governance in this
context, and the second research question is based on this. Another focus of the study considers connections between corporate governance, idiosyncratic risk, and firm performance, and a potential corporate governance-to-idiosyncratic volatility-to-firm performance link. The sub-research question is based on this.

This study follows aspects of Christensen et al. 2010; Ferreira and Laux, 2007; Hess et al. 2010; Kiel and Nicholson, 2003; and Pham et al. 2011 and 2012, combined with a unique set of corporate governance variables based on board structure and composition and also ownership and ownership structure. OLS regression analysis is used, and also 2SLS regression analysis to control for potential endogeneity of the governance variables (see for example, Ferreira and Laux, 2007; Hess et al. 2010; Pham et al. 2011 and 2012).

The relationship between idiosyncratic risk and corporate governance is the primary focus of this study. Therefore, idiosyncratic volatility (IVOL) is the dependent variable for the primary analysis. Considering the performance of the firms is a secondary aspect of the study, and performance (PFRM) is the secondary dependent variable, of which Tobin’s $Q$ (TBNQ) is the main measure of performance, hence, for the secondary analysis Tobin’s $Q$ (TBNQ) is the dependent variable. Regressions for both ROA and ROE are run for the purpose of robustness tests only, and reported in Appendix 1.

The independent variables include the total percentage of cross-held shares ($O_{XHLD}$); total percentage of institutional holdings ($O_{INST}$); total percentage of shares held by insiders ($O_{INSDR}$); the percentage voting rights/voting power of the single biggest blockholder ($VP_{BH}$); percentage of non-executive directors on the board ($B_{NEDS}$); percentage of women on the board ($B_{GD}$); the average number of other corporate affiliations among the board members ($B_{AFF}$); board size ($B_{SZE}$); and aDataStream corporate governance score ($CGSCR$). In addition, this study uses four control variables [growth ($GRW$); firm size ($SZE$); leverage ($LEV$); and industry ($IND$)] and six dichotomous variables in the form of six year dummies [$YRD2011$, $YRD2010$, $YRD2009$, $YRD2008$, $YRD2007$ and $YRD2006$]. However, one of the dummy variables is dropped to avoid the dummy variable trap (see, Gujarati, 1995). Table 3.2 contains a description of the variables.

This study is motivated by relevant aspects of corporate governance theory, and theory pertaining to idiosyncratic risk. The study is also motivated by the findings of Ferreira and Laux (2007) of a relationship between idiosyncratic risk and corporate governance in the US listed market, and the challenge this presents to test this finding in a market with internal-governance-control characteristics, such as the Australian market.

The current study differs from previous research in the area, because this study conducts an analysis of the relationship between idiosyncratic risk and corporate governance and also firm performance and corporate governance, in a market identified to
have internal-governance-control characteristics that does not rely on frequent intervention or discipline of the market. Further, the study employs a unique set of firm-level, internal-governance-control variables based on board structure and ownership structure as these are more relevant for a market such as the Australian market with the characteristics described above (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012). In addition, the current study considers a potential corporate governance-to-idiosyncratic volatility-to-firm performance link.

Therefore this study differs from prior research in the area, and to my knowledge the relationship between idiosyncratic risk and corporate governance has not been previously studied in the context of a market with internal-governance-control characteristics, such as the Australian market. Therefore, this study will add a valuable contribution to the knowledge and research on the relationship between idiosyncratic risk and corporate governance, also to the wider body of literature on both corporate governance and idiosyncratic risk.
Chapter 4 RESULTS

4.1. Introduction

This chapter presents the regression results, findings, analyses, and the descriptive statistics. The chapter begins with a re-cap of the focus of the study and the research questions. The descriptive statistics for both the pooled and annual data are presented and discussed. This is followed by a presentation and analysis of the regression results and findings of the various regressions for idiosyncratic volatility on corporate governance, and firm performance on corporate governance. In addition, a discussion and analysis of main findings implying a link between corporate governance, idiosyncratic volatility, and firm performance is given. This is followed by the chapter summary and conclusions.

The primary focus of this study is on the relationship between idiosyncratic risk and corporate governance. Research question one is based on examining and establishing this relationship in a market with internal-governance-control characteristics, such as the Australian market. Another focus of the study is on the relationship between firm performance and corporate governance in this context, employing Tobin's $Q$ as the main performance measure, and research question two is based on this. A final focus of the study considers a link between corporate governance, idiosyncratic volatility and firm performance, and this is the basis of the sub-research question.

However, the primary focus of the study is on the relationship between idiosyncratic risk and corporate governance in the context of internal governance controls, employing variables based on board structure and composition, and also on ownership and ownership structure. Therefore the primary aim of this study is to examine the relationship between idiosyncratic risk and corporate governance in this context. Regressions are run, analyses conducted, main findings identified and conclusions are formed based on the results of the various regression models.

4.2. Focus of the Study

A review of the literature reveals that idiosyncratic risk is an important factor impacting on firms, markets, and investment portfolios. For example, the literature finds that idiosyncratic risk is a dynamic element of information flow, market efficiency, firm
performance, value and returns (see for example, Angelidis, 2010; Ferreira and Laux, 2007; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997; Miller et al. 2002). Idiosyncratic risk is discussed in Chapter 2, Section 2.2.

However, as discussed in the previous chapter, for markets to develop and maintain optimal efficiency and value there also needs to be an effective corporate governance system in place, and even more so since the GFC. The relationship between idiosyncratic risk and corporate governance is important for firms and markets in the advancement of elements that are indicators of good corporate governance (see, Ferreira and Laux, 2007). Moreover, idiosyncratic risk is identified as a key element in corporate governance, and is both a potential indicator of good corporate governance and a determining factor for better corporate governance. Yet at the same time corporate governance impacts on idiosyncratic volatility (see, Ferreira and Laux, 2007). Therefore, the main focus of this study is on the relationship between idiosyncratic risk and corporate governance.

A review of the literature reveals a sparseness of studies on the relationship between idiosyncratic risk and corporate governance. In this study, based on the literature, it is argued that this is particularly so for a well-functioning market such as the Australian market that operates in an internal-governance-control system. That is, a corporate governance environment that is largely recommendations based, and that relies heavily on firm-level internal governance controls rather than external controls for the maintenance of good corporate governance and firm performance. Further, whilst there are mergers and takeovers in this market, they are not common phenomena (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012).

Therefore, the Australian market is a market with internal-governance-control characteristics that operates in an internal-governance-control system. In this thesis, markets that encompass these characteristics are described as markets with internal-governance-control characteristics, and a system of corporate governance that relies heavily on internal governance controls rather than external controls, is called as an internal-governance-control system.

The board of directors plays an important role in the governance of an organisation, and in particular, in markets that operate in an internal-governance-control system. This is due to the importance of firm-level control mechanisms in the governance of such firms and markets. Therefore board structure and composition is a primary corporate governance focus of this study. Ownership structure is another important element of corporate governance in this context, and is a major determinant of the balance of power within a company. Thus, ownership structure is also a primary corporate
governance focus of this study. Board structure and ownership structure are discussed in Chapter 2, Sections 2.3.4 and 2.3.5.

In summary, the current study is focused on the relationship between idiosyncratic risk and corporate governance (in addition to the relationship between firm performance and corporate governance), with a particular focus on firm-level internal-governance-control measures based on board structure and composition, and also based on ownership and ownership structure. This study employs data drawn from firms listed under the aforementioned internal-governance-control market conditions, recommendations and requirements of the Australian Securities Exchange (ASX).

In addition, a potential link between corporate governance, idiosyncratic risk and firm performance is considered following an analysis of regression results for both idiosyncratic volatility on corporate governance, and firm performance on corporate governance.

### 4.3. Research Questions

The research questions presented and discussed in the sections below are comprised of two research questions and a sub-research question. The primary focus of the study is on the relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics, and Research Question 1 is based on this. A secondary focus of the study is on the relationship between firm performance (Tobin’s $Q$) and corporate governance in a market identified to have internal-governance-control characteristics, and Research Question 2 is based on this. Another focus of the study is on a potential corporate governance-to-idiosyncratic volatility-to-firm performance link, and this is the basis of the Sub-research Question.

To address the research questions, the relationship between idiosyncratic volatility and corporate governance is examined, along with the relationship between Tobin’s $Q$ and corporate governance. Then, a potential corporate governance-to-idiosyncratic volatility-to-firm performance link is considered.
4.3.1. Research Question 1

*Is there a relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics?*

The findings of Research Question 1 will be concluded following tests and analysis of results for secondary Research Questions 1 (a) and 1 (b).

It is expected that this analysis will find idiosyncratic risk to be relevant and positively related to aspects of board structure and composition and also aspects ownership structure, that are conducive to good corporate governance.

This supposition is based on findings of Ferreira and Laux (2007) who studied similar but different aspects of idiosyncratic risk and corporate governance in terms of the information content of idiosyncratic volatility with a focus on the relationship between idiosyncratic risk and corporate governance. The focal point of the corporate governance aspect of the Ferreira and Laux (2007) study was based on external governance control mechanisms, and openness to the discipline of the market. Ferreira and Laux (2007) found that firms with less antitakeover provisions, and therefore greater openness to market control, experienced higher idiosyncratic volatility, which in turn lead to better corporate governance.

The current study proposed here is focused on internal governance controls based on aspects of board structure and composition and also on ownership structure, rather than external controls, as these are more relevant to firms and markets such as the Australian market (see for example, Christensen *et al.* 2010; Pham *et al.* 2011 and 2012), which has internal-governance-control characteristics, and which operates in an internal-governance-control system (see Chapter 2, Section 2.3.8). Therefore, this study expects that internal governance controls conducive to good corporate governance will be positively related to idiosyncratic volatility and also to firm performance.

4.3.1.1. Secondary Research Question 1(a)

*Is there a relationship between idiosyncratic risk and board structure and composition?*

To address this question, idiosyncratic volatility (IVOL) is regressed on a unique set of corporate governance variables based on board structure and composition. These include the percentage of non-executive directors on the board (B_NEDS); percentage of women on the board (B_GD); average number of other corporate affiliations of the board members (B_AFF); and board size (B_SZE).
4.3.1.2. Secondary Research Question 1(b)

Is there a relationship between idiosyncratic risk and ownership and ownership structure?

This question is addressed by regressing idiosyncratic volatility (IVOL) on a unique set of corporate governance variables based on ownership and ownership structure. These include the percentage of cross-held shares (O_XHLD); percentage of institutional held shares (O_INST); percentage of shares held by insiders (O_INSDR); percentage voting rights/voting power of the single biggest blockholder (VP_BH).

4.3.2. Research Question 2

Is there a relationship between firm performance (Tobin’s \( Q \)) and corporate governance in a market with internal-governance-control characteristics?

The results to this research question will be concluded following tests and analysis of results for secondary Research Questions 2 (a) and 2 (b).

It is expected that this analysis will find firm performance (Tobin’s \( Q \)) to be positively related to aspects of board structure and composition and also aspects ownership structure, conducive to good corporate governance.

Although firm performance and corporate governance has been widely researched, and positive relationships found (see for example, Adams and Mehran, 2012; Albuquerque and Wang, 2008; Bonn, 2004; Hess et al. 2010; Li and Naughton, 2007; McConnell et al. 2008), it is expected that the current study will add a valuable contribution to the literature in a number of ways. Firstly, this study conducts an analysis of the relationship between firm performance and corporate governance from the perspective of a market identified to have internal-governance-control characteristics and which operates largely in an internal-governance-control system that does not rely on frequent intervention or discipline of the market. Secondly, the current study employs a unique set of firm-level, internal-governance-control variables based on board structure and composition, and also on ownership structure, as these are more relevant for the Australian market (see for example, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012), which is identified as a market with internal-governance-control characteristics. Thirdly, an analysis of the relationship between firm performance and internal-governance-control measures is important to this study for the part that this relationship plays in an investigation into a potential corporate governance-to-idiosyncratic volatility-to-firm performance link.
4.3.2.1. Secondary Research Question 2(a)

Is there a relationship between Tobin’s Q and board structure and composition?

To address this question firm performance, Tobin’s Q (TBNQ) is regressed on firm-level, internal-governance-control variables based on board structure and composition. These include the percentage of non-executive directors on the board (B_NEDS); percentage of women on the board (B_GD); average number of other corporate affiliations of the board members (B_AFF); and board size (B_SZE).

4.3.2.2. Secondary Research Question 2(b)

Is there a relationship between Tobin’s Q and ownership and ownership structure?

This question is addressed by regressing firm performance, Tobin’s Q (TBNQ) on firm-level, internal-governance-control variables based on ownership structure. These include the percentage of cross-held shares (O_XHLD); percentage of institutional held shares (O_INST); percentage of shares held by insiders (O_INSDR); percentage voting rights/voting power of the single biggest blockholder (VP_BH).

4.3.3. Sub-Research Question

Is there a corporate governance-to-idiosyncratic volatility-to-firm performance link?

To address the Sub-research Question an analysis is conducted of the results of regressions conducted in response to all of the previous research questions. It is expected that the study will find an implied corporate governance-to-idiosyncratic volatility-to-firm performance link following the testing and analyses of Research Questions 1 and 2.

Ferreira and Laux (2007) footnoted the suggestion of a likely governance-to-volatility-to-expected returns link, based on their own findings and the findings of others such as Goyal and Santa-Clara, (2003), who found a positive relationship between idiosyncratic volatility and expected returns. The current study builds on this footnoted suggestion to propose a potential corporate governance-to-idiosyncratic volatility-to-firm performance link.
4.4. Descriptive Statistics

The descriptive statistics for the pooled data for both the dependent and independent variables is shown in Table 4.1 below.

Idiosyncratic volatility (IVOL) is the primary dependent variable. It ranges from a minimum of 0.005 to a maximum 0.350. The mean idiosyncratic volatility measure is 0.033, with a standard deviation of 0.025. The other dependent variable is firm performance (PFRM), represented by Tobin’s Q (ROA and ROE are robustness tests, discussed in Appendix 1). Tobin’s Q is the main performance measure used in this study. It ranges from -0.339 to 47.886, with a mean of 2.225 and a standard deviation of 2.744.

4.4.1. Pooled Data

Table 4.1 Descriptive Statistics (EOFY Pooled Data, 2006-2011)

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVOL</td>
<td>1482</td>
<td>0.005</td>
<td>0.350</td>
<td>0.033</td>
<td>0.025</td>
</tr>
<tr>
<td>PFRM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TBNQ</td>
<td>1277</td>
<td>-0.339</td>
<td>47.886</td>
<td>2.225</td>
<td>2.744</td>
</tr>
<tr>
<td>ROA</td>
<td>1489</td>
<td>-7.274</td>
<td>1.516</td>
<td>-0.017</td>
<td>0.334</td>
</tr>
<tr>
<td>ROE</td>
<td>1457</td>
<td>-653.770</td>
<td>236.470</td>
<td>2.790</td>
<td>46.381</td>
</tr>
<tr>
<td>GRWTH</td>
<td>1441</td>
<td>-2.896</td>
<td>3.022</td>
<td>0.087</td>
<td>0.252</td>
</tr>
<tr>
<td>SZE</td>
<td>1499</td>
<td>4.754</td>
<td>18.669</td>
<td>13.136</td>
<td>2.231</td>
</tr>
<tr>
<td>LEV</td>
<td>1488</td>
<td>0.000</td>
<td>1.653</td>
<td>0.184</td>
<td>0.182</td>
</tr>
<tr>
<td>O_XHLD</td>
<td>1458</td>
<td>0.000</td>
<td>88.000</td>
<td>8.925</td>
<td>14.253</td>
</tr>
<tr>
<td>O_INST</td>
<td>1458</td>
<td>0.000</td>
<td>65.000</td>
<td>9.473</td>
<td>11.220</td>
</tr>
<tr>
<td>O_INSDR</td>
<td>1458</td>
<td>0.000</td>
<td>68.000</td>
<td>4.390</td>
<td>10.519</td>
</tr>
<tr>
<td>VP_BH</td>
<td>749</td>
<td>0.050</td>
<td>68.400</td>
<td>20.601</td>
<td>11.208</td>
</tr>
<tr>
<td>B_NEDS</td>
<td>755</td>
<td>25.000</td>
<td>100.000</td>
<td>78.510</td>
<td>12.409</td>
</tr>
<tr>
<td>B_GD</td>
<td>786</td>
<td>0.000</td>
<td>57.140</td>
<td>8.376</td>
<td>9.852</td>
</tr>
<tr>
<td>B_AFF</td>
<td>772</td>
<td>0.000</td>
<td>5.460</td>
<td>1.558</td>
<td>0.884</td>
</tr>
<tr>
<td>B_SZE</td>
<td>786</td>
<td>2.000</td>
<td>20.000</td>
<td>7.258</td>
<td>2.325</td>
</tr>
<tr>
<td>CGSCR</td>
<td>787</td>
<td>4.690</td>
<td>96.680</td>
<td>60.614</td>
<td>23.483</td>
</tr>
</tbody>
</table>


There are a total of 18 independent variables. Not all of these are used in all regressions, and not all variables are shown here as some are nominal codes only. Growth, size, leverage and industry are control variables. Industry is not included in the table above as it is a nominal code. Growth has a mean of 0.087, a standard deviation of 0.252 and ranges from -2.896 to 3.022. Leverage ranges from 0.000 to 1.653, with a mean of 0.184 and a standard deviation of 0.182.
The descriptive statistics for the various corporate governance variables are displayed in Table 4.1 above. All of the ownership structure variables have 1458 observations each. The percentage voting rights/voting power of the single biggest blockholder variable (VP_BH) has 749 observations, which is similar in number of observations to the various board characteristics variables, and the DataStream corporate governance score.

As shown in Table 4.1, the average percentage of institutional ownership for the firms in this study is around 9.47%, which is more than double the average percentage of insider ownership of around 4.39%. However, the average percentage voting power of the single biggest blockholder is around 20.60%, more than double that of institutional ownership, and over five times more than insider ownership. The Australian system of equity ownership is based on voting rights equivalent to shareholdings (that is, one vote per share). Therefore, there is on average, a 20.60% single biggest blockholding in firms listed on the ASX300. Although this is quite substantial, the maximum percentage blockholding is around 68.40%. The average percentage of non-executive directors on a board for the firms in this study is showing as a quite a high average of 78.50%, and this has remained reasonably consistent over the period 2006 to 2011. The average percentage of women on a board is only 8.34% and this has declined by 20% over the period of the study.

### 4.4.2. Annual Data

| Table 4.2 Descriptive Statistics (Annual Data, 2006-2011) |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| IVOL | N | Minimum | Maximum | Mean | Std. Deviation |
| 2011 | 269 | 0.006 | 0.079 | 0.026 | 0.014 |
| 2010 | 260 | 0.005 | 0.177 | 0.040 | 0.021 |
| 2009 | 251 | 0.013 | 0.350 | 0.044 | 0.031 |
| 2008 | 248 | 0.011 | 0.348 | 0.032 | 0.031 |
| 2007 | 237 | 0.009 | 0.334 | 0.028 | 0.026 |
| 2006 | 217 | 0.007 | 0.108 | 0.027 | 0.017 |
| PFRM | TBNQ | N | Minimum | Maximum | Mean | Std. Deviation |
| 2011 | 229 | -0.003 | 16.239 | 1.931 | 2.008 |
| 2010 | 225 | 0.292 | 16.788 | 1.994 | 1.924 |
| 2009 | 217 | -0.339 | 31.845 | 1.910 | 2.986 |
| 2008 | 216 | 0.111 | 13.456 | 1.961 | 1.860 |
| 2007 | 203 | 0.340 | 47.886 | 3.099 | 4.126 |
| 2006 | 187 | 0.437 | 18.777 | 2.581 | 2.846 |
| ROA | N | Minimum | Maximum | Mean | Std. Deviation |
| 2011 | 261 | -1.039 | 0.969 | 0.026 | 0.174 |
| 2010 | 258 | -1.140 | 0.557 | 0.005 | 0.2003 |
| 2009 | 253 | -7.274 | 0.596 | -0.099 | 0.564 |
| 2008 | 250 | -2.303 | 0.832 | -0.035 | 0.317 |
| 2007 | 242 | -2.385 | 1.516 | 0.007 | 0.305 |
| 2006 | 225 | -2.535 | 1.224 | -0.007 | 0.284 |
|----------|--------|--------|--------|--------|--------|--------|
| ROE      | 260    | -129.400 | 125.020 | 6.893  | 25.321 |
|          | 254    | -132.210 | 94.030  | 2.578  | 29.729 |
|          | 250    | -653.770 | 128.670 | -11.101 | 70.985 |
|          | 248    | -313.160 | 165.630 | 4.668  | 43.365 |
|          | 227    | -211.960 | 148.250 | 9.698  | 39.951 |
|          | 218    | -493.050 | 236.470 | 4.745  | 52.468 |
| GRW      | 258    | -0.9109 | 2.393  | 0.094  | 0.240  |
|          | 253    | -1.399  | 0.649  | 0.023  | 0.173  |
|          | 251    | -1.197  | 1.023  | 0.064  | 0.239  |
|          | 242    | -0.932  | 1.042  | 0.107  | 0.227  |
|          | 228    | -1.179  | 1.564  | 0.127  | 0.251  |
|          | 209    | -2.896  | 3.022  | 0.120  | 0.355  |
| SZE      | 262    | 9.609   | 18.561 | 13.667 | 1.776  |
|          | 260    | 8.662   | 18.501 | 13.428 | 1.956  |
|          | 253    | 6.469   | 18.477 | 13.131 | 2.286  |
|          | 250    | 7.186   | 18.669 | 13.052 | 2.336  |
|          | 245    | 5.673   | 18.560 | 12.841 | 2.388  |
|          | 229    | 4.754   | 18.397 | 12.611 | 2.470  |
| LEV      | 260    | 0.000   | 1.054  | 0.169  | 0.157  |
|          | 260    | 0.000   | 0.932  | 0.169  | 0.170  |
|          | 252    | 0.000   | 0.955  | 0.195  | 0.192  |
|          | 248    | 0.000   | 1.653  | 0.201  | 0.208  |
|          | 242    | 0.000   | 0.836  | 0.186  | 0.178  |
|          | 226    | 0.000   | 0.816  | 0.185  | 0.181  |
| O_XHLD   | 270    | 0.000   | 68.000 | 9.048  | 14.223 |
|          | 258    | 0.000   | 69.000 | 9.473  | 14.231 |
|          | 249    | 0.000   | 77.000 | 9.402  | 14.440 |
|          | 240    | 0.000   | 88.000 | 9.250  | 14.312 |
|          | 228    | 0.000   | 88.000 | 8.171  | 14.200 |
|          | 213    | 0.000   | 88.000 | 7.991  | 14.176 |
| O_INST   | 270    | 0.000   | 61.000 | 8.330  | 10.402 |
|          | 258    | 0.000   | 57.000 | 7.380  | 9.431  |
|          | 249    | 0.000   | 50.000 | 7.627  | 9.366  |
|          | 240    | 0.000   | 65.000 | 11.763 | 13.214 |
|          | 228    | 0.000   | 54.000 | 11.465 | 11.894 |
|          | 213    | 0.000   | 55.000 | 10.906 | 12.080 |
| O_INSDR  | 270    | 0.000   | 68.000 | 3.944  | 10.181 |
|          | 258    | 0.000   | 68.000 | 4.736  | 10.859 |
|          | 249    | 0.000   | 63.000 | 0.884  | 4.841  |
|          | 240    | 0.000   | 63.000 | 5.508  | 11.495 |
|          | 228    | 0.000   | 64.000 | 5.645  | 12.018 |
|          | 213    | 0.000   | 54.000 | 6.033  | 11.591 |
| VP_BH    | 179    | 3.950   | 60.370 | 20.205 | 9.702  |
|          | 220    | 3.590   | 68.400 | 21.084 | 11.521 |
|          | 156    | 5.190   | 68.400 | 21.175 | 11.973 |
|          | 78     | 6.200   | 68.400 | 21.445 | 12.255 |
|          | 62     | 4.820   | 54.110 | 19.643 | 10.646 |
|          | 54     | 0.050   | 54.140 | 18.167 | 11.388 |

As shown in Table 4.2 above, average idiosyncratic volatility does not appear to follow a consistent trend over the years of this analysis. This is in line with the findings of Angelidis (2010) who studied levels of volatility in 24 emerging markets, including countries such as China, Russia, India and many others. A trend analysis was conducted on these markets between the years 1994 and 2007. Angelidis (2010) found that although there were fluctuations in volatility, there was no evidence of a trend in idiosyncratic volatility during that period of time. The observations shown in the descriptive statistics in Table 4.2 above are also in line with the findings of Bekaert, et al. (2012) who examined aggregate volatility in 23 developed markets up to 2008. They reported that other than a couple of occasional spikes in aggregate volatility, there was no evidence of a trend showing idiosyncratic volatility to be increasing.
In the current study, average idiosyncratic volatility is showing to be slightly higher in 2006 than it was in 2011. Further, the descriptive statistics show a relatively large spike in volatility between the years 2008 to 2010, during the financial crisis, then returning to a lower level than before the crisis quite quickly. This observation is in line with the findings of Schwert (1990) who reported that aggregate daily returns volatility increased dramatically during and immediately following the stock market crash of 1987, then returned to lower than normal levels much quicker than expected.

Figure 1 below depicts the average idiosyncratic volatility, 2006 to 2011, and average firm performance as measured by Tobin’s Q, 2006 to 2011.

**Figure 1 – Idiosyncratic Volatility and Tobin’s Q, 2006 to 2011**

As shown in Table 4.2, and also figures 2 and 3 below, the average percentage of institutional ownership (O_INST) has declined by around 20% from 2006 to 2011, while the average percentage of insider ownership (O_INSDR) has declined by around 50% over that same period, with a large drop in insider ownership between 2008 and 2009.

**Figure 2 – Institutional Ownership, 2006 to 2011**
However, as shown in Figure 4 below, the average percentage voting rights/voting power of the single blockholder (VP_BH) has increased by around 11% over the same period.

**Figure 4 – Voting Power of the Single Biggest Blockholder, 2006 to 2011**
Looking at the board characteristics variables shown in figures 5 and 6 below, the average percentage of non-executive directors (B_NEDS) on the average board, has remained relatively constant at around 78% to 80%, over the period 2006 to 2011, while the average percentage of women (B_GD) on the average board has decreased by approx 2% over the same period.

Figure 5 – Non-executive Directors, 2006 to 2011

Figure 6 – Women on the Board, 2006 to 2011
4.5. Regression Analyses and Results

The regression results and the analysis of results, for both idiosyncratic volatility (IVOL) and corporate governance, and also firm performance, Tobin’s Q (TBNQ) and corporate governance, are contained in Sections 4.5.1 and 4.5.2 below. This is followed by an overall discussion of the main findings, which is followed by the summary and conclusions.

4.5.1. Idiosyncratic Volatility and Corporate Governance

This section contains the regression results, key findings and analyses of the various regressions for idiosyncratic volatility on corporate governance. The regression models used are based on both the pooled and annual data. The Two-Stage Least Squares (instrumental variables approach), is also employed to control for any endogeneity of the corporate governance variables.

4.5.1.1. Pooled OLS Regression Analysis of Idiosyncratic Volatility and Ownership Structure

Idiosyncratic Volatility and Ownership Structure

Table 4.3 below provides the results for the pooled OLS regression analysis of idiosyncratic volatility and ownership structure for the period 2011-2006. The dependent variable is idiosyncratic volatility (IVOL). The regression equation is depicted as:

Equation 1

\[ IVOL = \alpha + \beta_1 GRW + \beta_2 SZE + \beta_3 LEV + \beta_4 IND + \beta_5 O_{-}XHLD + \beta_6 O_{-}INST + \beta_7 O_{-}INSDR + \beta_8 YRD2010 + \beta_9 YRD2009 + \beta_{10} YRD2008 + \beta_{11} YRD2007 + \beta_{12} YRD2006 + \varepsilon \]

Where: \( \alpha \) represents the intercept, \( \beta \) the regression coefficients; \( \varepsilon \) is an error term. IVOL represents idiosyncratic volatility and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O_XHLD representing total percentage of cross held shares, O_INST representing total percentage of institutional holdings and O_INSDR which represents total percentage of shares held by insiders. There are five dichotomous variables in the form of five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. Note that there were originally six year dummies. However, one of the year dummies was dropped to avoid the dummy variable trap (see, Gujarati, 1995). This process was followed for all of the pooled regressions. All of these variables are described in the description of the variables, Chapter 3, Table 3.2.
### Table 4.3 Pooled OLS Results for Idiosyncratic Volatility and Ownership Structure

<table>
<thead>
<tr>
<th>Dependent Variable – IVOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
</tr>
<tr>
<td>GRW</td>
</tr>
<tr>
<td>SZE</td>
</tr>
<tr>
<td>LEV</td>
</tr>
<tr>
<td>IND</td>
</tr>
</tbody>
</table>

#### Corporate Governance Variables

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>O_XHLD</td>
<td>-0.00003 (-0.876)</td>
</tr>
<tr>
<td>O_INST</td>
<td>-0.00039 *** (-8.248)</td>
</tr>
<tr>
<td>O_INSDR</td>
<td>-0.00018 *** (-3.680)</td>
</tr>
</tbody>
</table>

#### Year Variables

<table>
<thead>
<tr>
<th>Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>YRD2010</td>
<td>0.01202 *** (7.360)</td>
</tr>
<tr>
<td>YRD2009</td>
<td>0.01388 *** (8.373)</td>
</tr>
<tr>
<td>YRD2008</td>
<td>0.00531 *** (3.169)</td>
</tr>
<tr>
<td>YRD2007</td>
<td>-0.00167 (-0.978)</td>
</tr>
<tr>
<td>YRD2006</td>
<td>-0.00245 (-1.406)</td>
</tr>
</tbody>
</table>

#### Regression Statistics

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADJ R²</td>
<td>43.35%</td>
</tr>
<tr>
<td>F-statistic</td>
<td>89.58</td>
</tr>
<tr>
<td>Prob (F-statistic)</td>
<td>0.00</td>
</tr>
<tr>
<td>N</td>
<td>1390</td>
</tr>
</tbody>
</table>


The results of the pooled regression analysis of idiosyncratic volatility and ownership structure depicted in Table 4.3 above, shows that the adjusted R² is a robust 43.35%. The intercept is positive and significant at the 1% level, and the F-statistic is significant (p-value 0.00). The number of firm-level observations with all the necessary data for this analysis is 1390.
Key Findings

The key findings of this model are that both institutional ownership (O_INST) and insider ownership (O_INSDR) are negatively correlated with idiosyncratic volatility (IVOL) as predicted, and both results are highly significant at the 1% level. An analysis of results is discussed in the following paragraphs.

Ownership Structure

Institutional Ownership (O_INST)

The regression coefficient on institutional ownership of -0.00039 is significant at the 1% level (t-statistic -8.25). This establishes a clear relationship between institutional ownership and idiosyncratic volatility: for the average firm, a 1 point increase in institutional ownership has the effect of reducing idiosyncratic volatility by approximately 0.039%. Therefore, on average, the greater the percentage of institutional ownership for the firms in this study, the lower the level of idiosyncratic volatility. Following a review of the literature it appears that this is the first time this has been studied and this result found in relation to a market with internal-governance-control characteristics.

It is suggested that greater institutional ownership helps to make boards more committed and attentive to their duties (see, Ho, 2005; Short and Keasey, 2005), leads to better monitoring of management, and better protection and outcomes for shareholders (see, Agrawal and Mandelker, 1990). Moreover, it is suggested that there may be a clientele effect, in that institutional investors will sometimes purchase holdings in a company according to the company’s existing governance policies. Then, once they are established as part of the ownership structure of that company, they will work to further improve governance practices (see for example, Ackert and Athanassakos, 2001; Bushee et al. 2009; Hartzell and Starks, 2003). Therefore, institutional ownership should help to reduce both real and perceived levels of risk for a firm (see for example, Pham et al. 2011 and 2012). However, as previously discussed, it depends on the type of institutional investor as to the impact on the firm (Lehmann and Weigand, 2000).

Insider Ownership (O_INSDR)

The regression coefficient on insider ownership of -0.00018 is significant at the 1% level (t-statistic -3.68). This establishes a clear relationship between insider ownership and idiosyncratic volatility: for the average firm, a 1 point increase in insider ownership has the effect of reducing idiosyncratic volatility by approximately 0.018%. Therefore, on average, the greater the percentage of insider ownership for the firms in this study, the lower the level of idiosyncratic volatility. A review of the literature reveals that this is the
first time this has been studied and this result found in relation to a market with internal-governance-control characteristics.

Insider ownership, in the form of management ownership, works to align the incentives of management with the goal of shareholder wealth maximisation (see for example, Jensen, 1993; Mörck et al. 1988; Mörck et al. 2005). However, if owner managers become overly large and entrenched they will often try to protect themselves by reducing personal risk exposure. Hence, they may focus on less risky projects and strategies that are not always in the best interests of the other shareholders (see for example, Mörck et al. 1988; Mörck et al. 2005; Tufano, 1996). At the same time it is suggested that the various problems associated with large entrenched insiders is often offset by the incentive alignment benefits of large owner managers (see for example, Hillier and McColgan, 2008; Short and Keasey, 1999). Therefore, insider ownership has the potential to reduce both real and perceived levels of risk for a firm (see for example, Pham et al. 2011 and 2012). However, this depends on how large and controlling the entrenched ownership becomes (see for example, Mörck et al. 1988; Mörck et al. 2005).

**Institutional Ownership (O_INST) and Insider Ownership (O_INSDR)**

Therefore, as discussed above, both institutional ownership and insider ownership can reduce levels of firm-specific risk (see for example, and related discussion, Anderson et al. 2003; Anderson and Reeb, 2003; Pham et al. 2011 and 2012). Furthermore, it is suggested that institutional ownership often resembles a well-diversified blockholder, whereas insider ownership often resembles an undiversified, long-term, committed, and risk adverse blockholder (see, Anderson et al. 2003; Anderson and Reeb, 2003). Therefore both types of equity holders have the potential to reduce levels of risk exposure not only for themselves and also for the firm. However, the institutional ownership variable used in this study represents a long-term strategic holding. Hence, this type of intuitional ownership fits partly with the description of an insider equity holding and partly with the description of an institutional equity holding (see, Anderson et al. 2003; Anderson and Reeb, 2003). However, the end effect is still the same in that this type of holding is likely to reduce real and perceived levels of risk for a firm (see for example, Pham et al. 2011 and 2012). In addition, it is suggested that the monitoring effects of both insider ownership and institutional ownership can reduce instances of agency problems and costs (see for example, Jensen, 1993).

The descriptive statistics based on the pooled data for this study shows the overall average percentage of institutional ownership is around 9.5%, while the overall average percentage of insider ownership is around 4.4%, less than half that of the institutional
ownership. However, there is an average maximum percentage of 65% for institutional ownership and an average maximum of approximately 68% for insider ownership. Therefore, there are some firms with very large holdings of institutional ownership and some firms with equally large insider holdings. As the firms in this study are listed on the ASX300, they are all relatively large firms with institutional ownership, and/or insider ownership as part of their ownership structures, with some firms containing quite large holdings. Hence, the findings and suggestions discussed above, along with the descriptive statistics for the study, offers some possible explanations for the highly significant negative correlations found to exist between institutional ownership and idiosyncratic volatility, and also insider ownership and idiosyncratic volatility. See, Chapter 2, Section 2.3.5 and Chapter 3, Section 3.11.2 for more discussion on both institutional ownership and insider ownership. These variables are described in Chapter 3, Table 3.2.

**Control Variables**

*Growth (GRW)*

According to the results shown in Table 4.3 above, growth is negatively correlated with idiosyncratic volatility as predicted, with a significant result at the 1% level. Hence, for the average firm in this study, the higher the current growth rate, the lower the level of idiosyncratic volatility.

*Firm Size (SZE)*

Size is negatively correlated with idiosyncratic volatility as predicted, and significant at the 1% level. Therefore, on average for the average firm, the larger the size of the firm, the lower the level of idiosyncratic volatility. This is consistent with previous findings that small firms typically contain higher levels of idiosyncratic volatility (see for example, Malkiel and Xu, 1997).

*Dichotomous Year Dummies*

Finally, the regression results in Table 4.3 above show that the year dummies for years 2008, 2009 and 2010 are positively correlated with idiosyncratic volatility and significant at the 1% level, indicating that idiosyncratic volatility was higher for the average firm during that period.
4.5.1.2. Pooled OLS Regression for Idiosyncratic Volatility, Ownership and Board Characteristics

Idiosyncratic Volatility and Ownership and Board Characteristics

Table 4.4 below provides results for the pooled OLS regression analysis of idiosyncratic volatility, ownership and board characteristics for the period 2001-2006. The dependent variable is IVOL. The regression equation is depicted as:

\[ IVOL = \alpha + \beta_1 GRW + \beta_2 SZE + \beta_3 LEV + \beta_4 IND + \beta_5 O_{XHLD} + \beta_6 O_{INST} + \]
\[ \beta_7 O_{INSDR} + \beta_8 VP_{BH} + \beta_9 B_{NEDS} + \beta_{10} B_{GD} + \beta_{11} B_{AFF} + \beta_{12} B_{SZE} + \]
\[ \beta_{13} CGSCR + \beta_{14} YRD2010 + \beta_{15} YRD2009 + \beta_{16} YRD2008 + \beta_{17} YRD2007 + \beta_{18} YRD2006 + \epsilon \]

Where: \( \alpha \) represents the intercept, \( \beta \) the regression coefficients; \( \epsilon \) is an error term. IVOL represents idiosyncratic volatility and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O_{XHLD} representing total percentage of cross held shares, O_{INST} representing total percentage of institutional holdings and O_{INSDR} which represents total percentage of shares held by insiders, and VP_{BH} which represents the percentage ownership/voting power of the single biggest blockholder, plus, B_{NEDS} which is the total percentage of non-executive board members, B_{GD} is the percentage of women on the board, B_{AFF} represents the average number of other corporate affiliations of board members, B_{SZE} represents the size of the board, and CGSCR which is aDataStream corporate governance score. There are five dichotomous variables in the form of five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. All of the variables are described in Chapter 3, Table 3.2.
Table 4.4 Pooled OLS Results for Idiosyncratic Volatility, Ownership and Board Characteristics

<table>
<thead>
<tr>
<th>Dependent Variable – IVOL</th>
<th>Pooled – 2006-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.08385 ***</td>
</tr>
<tr>
<td></td>
<td>(18.027)</td>
</tr>
<tr>
<td>GRW</td>
<td>-0.00573 ***</td>
</tr>
<tr>
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<td>-(3.108)</td>
</tr>
<tr>
<td>SZE</td>
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<tr>
<td></td>
<td>-(9.321)</td>
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<tr>
<td>LEV</td>
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</tr>
<tr>
<td></td>
<td>(0.274)</td>
</tr>
<tr>
<td>IND</td>
<td>0.00030</td>
</tr>
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<td></td>
<td>(1.179)</td>
</tr>
<tr>
<td>Corporate Governance Variables</td>
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</tr>
<tr>
<td>O_XHLD</td>
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</tr>
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<td></td>
<td>(0.754)</td>
</tr>
<tr>
<td>O_INST</td>
<td>-0.00026 ***</td>
</tr>
<tr>
<td></td>
<td>-(6.269)</td>
</tr>
<tr>
<td>O_INSDR</td>
<td>-0.00013 ***</td>
</tr>
<tr>
<td></td>
<td>-(2.651)</td>
</tr>
<tr>
<td>VP_BH</td>
<td>0.00015 ***</td>
</tr>
<tr>
<td></td>
<td>(3.190)</td>
</tr>
<tr>
<td>B_NEDS</td>
<td>-0.00009 **</td>
</tr>
<tr>
<td></td>
<td>-(2.437)</td>
</tr>
<tr>
<td>B_GD</td>
<td>-0.00015 ***</td>
</tr>
<tr>
<td></td>
<td>-(3.257)</td>
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<tr>
<td>B_AFF</td>
<td>0.00169 ***</td>
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<td></td>
<td>(3.316)</td>
</tr>
<tr>
<td>B_SZE</td>
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<td></td>
<td>-(2.938)</td>
</tr>
<tr>
<td>CGSCR</td>
<td>0.00004 *</td>
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<tr>
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<td>(1.673)</td>
</tr>
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<td>Year Variables</td>
<td></td>
</tr>
<tr>
<td>YRD2010</td>
<td>0.01152 ***</td>
</tr>
<tr>
<td></td>
<td>(10.742)</td>
</tr>
<tr>
<td>YRD2009</td>
<td>0.01171 ***</td>
</tr>
<tr>
<td></td>
<td>(9.768)</td>
</tr>
<tr>
<td>YRD2008</td>
<td>0.00207</td>
</tr>
<tr>
<td></td>
<td>(1.278)</td>
</tr>
<tr>
<td>YRD2007</td>
<td>-0.00168</td>
</tr>
<tr>
<td></td>
<td>-(0.954)</td>
</tr>
<tr>
<td>YRD2006</td>
<td>-0.00014</td>
</tr>
<tr>
<td></td>
<td>-(0.067)</td>
</tr>
</tbody>
</table>
Regression Statistics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adj R²</td>
<td>52.76%</td>
</tr>
<tr>
<td>F-stat</td>
<td>42.26</td>
</tr>
<tr>
<td>F-stat Prob</td>
<td>0.000</td>
</tr>
<tr>
<td>Obs (n)</td>
<td>666</td>
</tr>
</tbody>
</table>


The results of the pooled regression analysis of idiosyncratic volatility, ownership and board characteristics depicted in Table 4.4 above shows a robust adjusted R² of 52.76%. The intercept is positive and significant at the 1% level, and the F-statistic is significant (p-value 0.000). The number of firms with all the necessary data for this regression analysis is 666.

**Key Findings**

The key findings of this model are that both institutional ownership (O_INST) and insider ownership (O_INSDDR) are again negatively correlated with idiosyncratic volatility (IVOL) as predicted, and highly significant. The percentage voting rights/voting power of the single biggest blockholder (VP_BH) is positively correlated with idiosyncratic volatility and highly significant. The total percentage of non-executive directors (B_NEDS) is negatively correlated with idiosyncratic volatility. The percentage of women on the board (B_GD) is negatively correlated with idiosyncratic volatility and highly significant. The average number of other corporate affiliations of the board members (B_AFF) is positively correlated and highly significant. Board size (B_SZE) is negatively correlated and highly significant. An analysis and discussion of results is contained in the following paragraphs.

**Ownership and Ownership Structure**

**Institutional Ownership (O_INST) and Insider Ownership (O_INSDDR)**

As discussed above, both institutional ownership and insider ownership are again negatively correlated with idiosyncratic volatility and highly significant. An analysis of the regression results shows that the inclusion of the board characteristics variables has attenuated the robust statistics of the ownership variables only slightly.
Institutional Ownership (O_INST)

The institutional ownership regression coefficient of -0.00026 is significant at the 1% level (t-statistic -6.27). This establishes a clear relationship between institutional ownership and idiosyncratic volatility: for the average firm, a 1 point increase in institutional equity ownership has the effect of reducing idiosyncratic volatility by approximately 0.026%. Accordingly, on average for the firms in this study, the greater the institutional ownership, the lower the level of idiosyncratic volatility. Discussion on the relationship between institutional ownership and idiosyncratic volatility is presented following the regression results for idiosyncratic volatility and ownership structure shown in Table 4.3. Ownership structure is discussed in Chapter 2, Section 2.3.5. Ownership variables are discussed and described in Chapter 3, Section 3.11.2, and Table 3.2.

Insider Ownership (O_INSDR)

The regression coefficient on insider ownership of -0.00013 is significant at the 1% level (t-statistic -2.65). This establishes a clear relationship between insider ownership and idiosyncratic volatility: for the average firm, a 1 point increase in insider ownership has the effect of reducing idiosyncratic volatility by approximately 0.013%. Therefore, on average, for the firms in this study, the greater the percentage of insider ownership, the lower the level of idiosyncratic volatility. Discussion on the relationship between insider ownership and idiosyncratic volatility is presented following the regression results for idiosyncratic volatility and ownership structure shown in Table 4.3. Ownership structure is discussed in Chapter 2, Section 2.3.5. Ownership variables are discussed and described in Chapter 3, Section 3.11.2, and Table 3.2.

Voting Power/Voting Rights of the Single Biggest Blockholder (VP_BH)

The variable representing the percentage voting power of the single biggest blockholder is positively correlated with idiosyncratic volatility as predicted. The regression coefficient of 0.00015 is significant at the 1% level (t-statistic 3.19). This establishes a clear relationship between the voting power of the single biggest blockholder and idiosyncratic volatility: for the average firm, a 1 point increase in the voting power of the single biggest blockholder has the effect of increasing idiosyncratic volatility by approximately 0.015%. Therefore, on average for the average firm, the greater the percentage voting power of the single biggest blockholder, the higher the level of idiosyncratic volatility. To my knowledge this is the first time this has been studied and this result found. Furthermore, as the Australian listed market works on a one share, one vote basis, this result also indicates that on average, the larger the size of the single biggest
blockholder, as a percentage relative to a firm's total equity holdings, the higher the level of idiosyncratic risk for the firms in this study.

As discussed in the literature review, large controlling shareholders have the both the motivation and the power to monitor the actions of management and to influence decisions and outcomes (see, Denis and McConnell, 2003). Therefore, the presence of blockholders can help to reduce agency problems and to improve shareholder protection (see for example, Agrawal and Mandelker, 1990; Demsetz and Ricardo-Campbell, 1983; Shleifer and Vishny, 1986; Shleifer and Vishny, 1997). However, this is not always the case because the impact of blockholders on the firm is reliant on a number of factors including the type of holding, who the blockholder is, the degree of ownership concentration, and the balanced and considered use of power and control (see for example, Barclay and Holderness, 1989; Denis and McConnell, 2003).

As the firms in this study are from the ASX300 and are on average, relatively large firms, they will typically contain blockholdings as a proportion of their total equity holdings. The descriptive statistics for the pooled data shows that these holdings can be quite substantial, with an overall average mean holding of 21%, and an overall average maximum holding of around 68%. As shown by the result of this analysis, for the average firm, the larger the size of the single biggest blockholder, the higher the level of idiosyncratic volatility.

Therefore, based on the literature and the descriptive statistics, a possible explanation for the positive relationship between the voting power of the single biggest blockholder and idiosyncratic volatility is the ever-present risk that controlling shareholders may misuse their power and control to their own advantage, and to the detriment of the firm and the other shareholders. Therefore, the unique risk that an individual firm faces when there is a large controlling blockholder is the risk that a stable and mutually beneficial environment could change, impacting negatively on the firm and the other shareholders. See Chapter 2, Section 2.3.5, for more discussion on ownership structure. See also Chapter 3, Section 3.11.2, and Chapter 3, Table 3.2, for a description of this variable.

**Board Structure and Composition**

*Non-executive Directors (B_NEDS)*

Of the board characteristics variables, the percentage of non-executive directors on Australian corporate boards is shown to be on average, negatively correlated with idiosyncratic volatility as predicted. The regression coefficient on this variable of -0.00009 is significant at the 5% level (t-statistic -2.44). This establishes a clear relationship
between the percentage of non-executive directors on a corporate board and idiosyncratic volatility: for the average firm, a 1 point increase in the percentage of non-executive directors has the effect of reducing idiosyncratic volatility by approximately 0.009%. Therefore, on average, the higher the percentage of non-executive directors on the boards of the firms in this study, the lower the level of idiosyncratic volatility. To my knowledge this is the first time this has been studied and this result found.

As discussed in the literature review, including a greater number on non-executive directors on a corporate board leads to better corporate governance. This is because non-executive directors can play a valuable role in making executive directors more accountable for their decisions and actions, and for ensuring fair and objective judgement on important issues concerning the company (see for example, Chen and Jaggi, 2001; Leeson et al. 2010; Pass, 2004; Young, 2000). The presence of non-executive directors on a corporate board can help with the alignment of management and shareholder interests and with the goal of shareholder wealth maximisation, while also providing a degree of impartially between executive directors and shareholders (see for example, Chen and Jaggi, 2001; Pass, 2004). This is not only in the best interests of shareholders, but can also provide some protection for executives if they have inadvertently diverted from the main focus, made an erroneous judgement, or missed some important issue (for related discussion, see, Chen and Jaggi, 2001; Leeson et al. 2010; Pass, 2004; Young, 2000). The descriptive statistics based on the pooled data, show that on average, firms in the ASX300 contain quite a high percentage of non-executive directors on their corporate boards. The statistics show an overall average mean, over the years 2006-2011 of 78.5%.

Therefore, based on the literature and the descriptive statistics, a possible explanation for the negative correlation found between the percentage of non-executive directors and idiosyncratic volatility could be that a greater the percentage of non-executive directors can provide and impartial safeguard between the board of directors and management allowing for greater insight and objectivity in decision making, and generally keeping executive directors on track and focused on the best interests of the shareholders. All of these aspects should help to reduce risks associated with poor executive decision making and judgements, and therefore serve to reduce levels of idiosyncratic volatility for the firm. See Chapter 2, Section 2.3.4, for more discussion on board structure and composition. Variables based on board structure and composition are discussed and described in Chapter 3, Section 3.11.2 and Table 3.2.

Gender Diversity (B_GD)

The percentage of women on the corporate boards of the firms in this study is showing to be negatively correlated with idiosyncratic volatility as predicted, and highly
significant. The regression coefficient on this variable of \(-0.00015\) is significant at the 1\% level (t-statistic \(-3.26\)). This establishes a clear relationship between the percentage of women on a corporate board and idiosyncratic volatility: for the average firm, a 1 point increase in the percentage of women on a corporate board has the effect of reducing idiosyncratic volatility by approximately 0.015\%. Therefore, on average, the greater the percentage of women on a corporate board for the firms in this study, the lower the level of idiosyncratic volatility. To my knowledge this is the first time this has been studied and this result found. Therefore on average, the greater the percentage of women on the boards of Australian firms listed on the ASX300, the lower the levels of idiosyncratic volatility for those firms.

As discussed in the literature review, gender diversity can offer a fresh outlook to the board, and a different approach to decision making (see for example, Adams and Ferreira, 2009a; Erhardt, Werbel, and Shrader, 2003; van der Walt and Ingley, 2003). It is suggested that male and female directors often exhibit differences in decision making, expectations and predictions. This is because female directors tend to be more conservative in their approach and attitude to risk than their male counterparts (see for example, and related discussion, Barber and Odean, 2001; Burke, 2003; Levi et al. 2013). Adams and Ferreira, (2009a) discuss that although there are a number positive aspects to gender diversity, there are some negative aspects as well. For instance, they argue that expecting firms to include more women on a board that is already performing efficiently and effectively, has a negative impact on firm performance. The descriptive statistics based on the pooled data for this study show that there is an overall average mean of only 8\% of a corporate board that is comprised of female directors.

Thus, based on the literature and the descriptive statistics, an explanation for the negative relationship between the total percentage of women on the board of directors and idiosyncratic volatility could be to do with some of the aspects discussed above, in particular, the suggestion that male and female directors tend to exhibit differences in approach to decision making, expected outcomes, and attitude to risk. Although, one cannot generalise, and many other aspects come into play with regard to leadership style, it is may be plausible that on average, women directors tend to be more conservative and cautious in their strategic approach and decision making, hence the negative correlation between this variable and idiosyncratic volatility. See Chapter 2, Section 2.3.4 for more discussion on board structure and composition, including gender diversity. See also Chapter 3, Section 3.11.2 and Table 3.2 for a description of the variables.
Other Corporate Affiliations of Board Members (B_AFF)

The average number of other corporate affiliations of the board members on the corporate boards of firms in the ASX300 is positively correlated with idiosyncratic volatility as predicted, and highly significant. The regression coefficient on this variable of 0.00169 is significant at the 1% level (t-statistic 3.32). This establishes a clear relationship between the average number of other corporate affiliations of the board members and idiosyncratic volatility: for the average firm, a 1 point increase in the average number of other corporate affiliations of the board members has the effect of increasing idiosyncratic volatility by approximately 0.169%. Therefore, on average for the firms in this study, the larger the average number of other corporate affiliations of the board members, the higher the level of idiosyncratic volatility. To my knowledge this is the first time this has been studied and this result found.

As discussed in the literature review, the market perceives that directors who serve on a number of corporate boards are too busy to carry out their duties efficiently (see, Haniffa and Hudaib, 2006), and in many cases this perception is correct (see, Core et al. 1999). Further, when boards are too busy with outside corporate affiliations and multiple directorships, corporate governance is weaker and agency problems and costs increase (see for example, Cohen et al. 2004; Core et al. 1999; Fich and Shivdasani, 2006). This is because there is not be enough time and resources to adequately monitor management (see for example, Core et al. 1999).

On the other hand, background experience and outside corporate affiliations can provide a positive signalling effect, with regard to experience and expertise on the board (see for example, Higgins and Gulati, 2003; Kim and Higgins, 2007). In addition, multiple directorships and outside corporate affiliations can give top executives a level of rapport and increased visibility. This can enhance a company’s ability to develop beneficial associations, gain access to valuable resources, and win profitable contracts (see for example, and related discussion, Higgins and Gulati, 2003; Kiel and Nicholson, 2006; Kim and Higgins, 2007).

The descriptive statistics of the pooled data show that the overall average mean number of other corporate affiliations of the board members is only 1.6, with a maximum mean of approximately 5.5. Therefore, although, the results of this study show a positive correlation between the average number of outside corporate affiliations of the board members, and levels of idiosyncratic volatility, the corporate boards in this study do not appear to be excessively busy. In addition, these firms are large enough to cope with increased levels of idiosyncratic volatility, in the interests of the positive signalling and increased visibility.
Therefore, based on the literature and the descriptive statistics, one explanation for the positive relationship between idiosyncratic volatility and this variable could be that boards and their firms will experience increased levels of visibility, and hence greater levels of idiosyncratic volatility, with additional outside alliances and associations. See Chapter 2, Section 2.3.4, for more discussion board structure and composition. See also, Chapter 3, Section 3.11.2 and Table 3.2 for a description of the variables.

Board Size (B_SZE)

The size of a corporate board is negatively correlated with idiosyncratic volatility, and highly significant. The regression coefficient on board size of -0.00076 is significant at the 1% level (t-statistic -2.94). This establishes a clear relationship between board size and idiosyncratic volatility: for the average firm, a 1 point increase in board size has the effect of reducing idiosyncratic volatility by approximately 0.076%. Therefore, on average, the larger the size of a corporate board of the firms in this study, the lower the level of idiosyncratic volatility. To my knowledge this is the first time this has been studied and this result found.

As discussed in the literature review, even though larger boards are more able to monitor the activities of management, communication is often poorer (see, Jensen, 1993; Lipton and Lorsch, 1992), and therefore information flow restricted. Further, limiting board size is found to improve the effectiveness of a corporate board (Yermack, 1996).

The descriptive statistics for this study shows that the overall mean number of directors on the average board in this study is merely 7, with an overall maximum mean number of directors of just 20. Hence, Australian firms are already limiting the size of their corporate boards. However, the findings of this analysis indicate that even though the firms in this study are relatively large firms by Australian listed market terms, the more these firms limit the size of their boards, the higher the levels of idiosyncratic volatility in those firms. Therefore, based on the literature and the descriptive statistics, an explanation for the negative relationship between board size and idiosyncratic volatility found in this study, may be that there is less information flow with the relatively larger boards, and hence lower levels of idiosyncratic volatility. See Chapter 2, Section 2.3.4, for more discussion on board structure and composition. Variables based on board structure and composition are discussed and described in Chapter 3, Section 3.11.2 and Table 3.2.

Corporate Governance Score (CGSCR)

The results of this analysis show that the DataStream corporate governance score used in this study is positively correlated with idiosyncratic volatility at the 10% level. The regression coefficient on this variable is 0.00004, with a t-statistic of only 1.673.
Therefore, the relationship between the corporate governance score and idiosyncratic volatility is not strong. However, there is still on average, a positive relationship, and therefore potential for a higher corporate governance score to equate to higher levels of idiosyncratic volatility.

The DataStream corporate governance score used in this study is based on a transparency score, combined with elements including board structure, board functions, compensation policy, shareholder rights, vision and strategy (DataStream, 2012). Therefore, based on the literature, an explanation for the result of this analysis could be that the application of the individual factors contained in the governance score leads to greater openness and transparency, and hence, keeping the channels of information flow open, hence increasing levels of idiosyncratic volatility. However, as a one-size fits all composite measure of corporate governance, the relationship between this variable and idiosyncratic volatility is not strong. See Chapter 2, Section 2.3.6 for more discussion. See also Chapter 3, Section 3.11.2 and Table 3.2 for a description of this variable.

**Control Variables**

*Firm Size (SZE) and Growth (GRW)*

As shown in the previous regression results in Table 4, the results of this regression analysis once again show that both growth and firm size are negatively correlated with idiosyncratic volatility and significant at the 1% level.

*Dichotomous Year Dummies*

Finally, the results of this regression show that idiosyncratic volatility is positively correlated with the year dummies for 2010 and 2009, at the 1% level.

**4.5.1.3. Pooled Two-Stage Least Squares (2SLS) Regression for Idiosyncratic Volatility and Ownership and Board Characteristics**

As discussed in Section 3.4, corporate governance variables are sometimes endogenous (see for example, Hess et al. 2010; Pham et al. 2011 and 2012). Therefore, to control for any potential endogenous relationships the 2SLS (instrumental variables approach) model is used in this study. See Chapter 3, Section 3.8.2, for discussion on the 2SLS, instrumental variables approach.
Idiosyncratic Volatility and Ownership and Board Characteristics

Table 4.5 below provides results for the pooled 2SLS regression analysis of idiosyncratic volatility, ownership and board characteristics for the period 2011-2006. The dependent variable is IVOL. The regression equation is depicted as:

Equation 5

\[ IVOL = \alpha + \beta_1 GRW + \beta_2 SZE + \beta_3 LEV + \beta_4 IND + \beta_5 O\_INST + \beta_6 O\_INSDR + \beta_7 VP\_BH + \beta_8 B\_NEDS + \beta_9 B\_GD + \beta_{10} B\_AFF + \beta_{11} B\_SZE + \beta_{12} CGSCR + \beta_{13} YRD2010 + \beta_{14} YRD2009 + \beta_{15} YRD2008 + \beta_{16} YRD2007 + \beta_{17} YRD2006 + \epsilon \]

Where: \( \alpha \) represents the intercept, \( \beta \) the regression coefficients; \( \epsilon \) is an error term. IVOL represents idiosyncratic volatility and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O_INST representing total percentage of institutional holdings, O_INSDR which represents total percentage of shares held by insiders and VP_BH which represents the percentage ownership/voting power of the single biggest blockholder, plus, B_NEDS which is the total percentage of non-executive board members, B_GD is the percentage of women on the board, B_AFF represents the average number of other corporate affiliations of board members, B_SZE represents the size of the board, and CGSCR which is a corporate governance score. There are five dichotomous variables in the form of five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006.

The list of instrumental variables is comprised of: GRW, SZE, LEV, IND, O_XHLD, O_INST, O_INSDR, B_NEDS, B_GD, B_AFF, B_SZE and CGSCR, plus, five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. See Chapter 3, Section 3.9.2 for a detailed description of this model. All of the variables are described in the description of the variables in Chapter 3, Table 3.2.
Table 4.5 Pooled 2SLS Results for Idiosyncratic Volatility, Ownership and Board Characteristics

<table>
<thead>
<tr>
<th>Dependent Variable – IVOL</th>
<th>Pooled – 2006-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.08388 ***</td>
</tr>
<tr>
<td></td>
<td>(18.026)</td>
</tr>
<tr>
<td>GRW</td>
<td>-0.00568 ***</td>
</tr>
<tr>
<td></td>
<td>(-3.075)</td>
</tr>
<tr>
<td>SZE</td>
<td>-0.00379 ***</td>
</tr>
<tr>
<td></td>
<td>(-9.494)</td>
</tr>
<tr>
<td>LEV</td>
<td>0.00056</td>
</tr>
<tr>
<td></td>
<td>(0.205)</td>
</tr>
<tr>
<td>IND</td>
<td>0.00027</td>
</tr>
<tr>
<td></td>
<td>(1.055)</td>
</tr>
<tr>
<td>Corporate Governance Variables</td>
<td></td>
</tr>
<tr>
<td>O_INST</td>
<td>-0.00027 ***</td>
</tr>
<tr>
<td></td>
<td>(-6.664)</td>
</tr>
<tr>
<td>O_INSDR</td>
<td>-0.00015 ***</td>
</tr>
<tr>
<td></td>
<td>(-3.019)</td>
</tr>
<tr>
<td>VP_BH</td>
<td>0.00021 ***</td>
</tr>
<tr>
<td></td>
<td>(2.876)</td>
</tr>
<tr>
<td>B_NEDS</td>
<td>-0.00009 **</td>
</tr>
<tr>
<td></td>
<td>(-2.458)</td>
</tr>
<tr>
<td>B_GD</td>
<td>-0.00015 ***</td>
</tr>
<tr>
<td></td>
<td>(-3.253)</td>
</tr>
<tr>
<td>B_AFF</td>
<td>0.00166 ***</td>
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<td></td>
<td>(3.271)</td>
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<tr>
<td>B_SZE</td>
<td>-0.00077 ***</td>
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<tr>
<td></td>
<td>(-2.949)</td>
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<tr>
<td>CGSCR</td>
<td>0.00004 *</td>
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<td>(1.666)</td>
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<td>Year Variables</td>
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<tr>
<td>YRD2010</td>
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<td>(1.360)</td>
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<td>YRD2007</td>
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<td>YRD2006</td>
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<td>(0.067)</td>
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Regression Statistics

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>ADJ $R^2$</td>
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</tr>
<tr>
<td>F-statistic</td>
<td>44.07</td>
</tr>
<tr>
<td>Prob (F-statistic)</td>
<td>0.000</td>
</tr>
<tr>
<td>J-statistic</td>
<td>0.000</td>
</tr>
<tr>
<td>Observations</td>
<td>666</td>
</tr>
</tbody>
</table>


As discussed earlier, corporate governance variables have potential for endogeneity of the measures (see, Pham et al. 2011 and 2012; Hess et al. 2010). For instance, Hess et al. (2010) employed both OLS and 2SLS regressions models to control for potential endogenous relationships between ownership and firm performance, in particular, between a variables representing concentrated ownership and Tobin’s $Q$, and also private blockholders and Tobin’s $Q$.

Therefore, following Hess et al. (2010), where both ownership concentration and private blockholdings were treated as endogenous – the variable identified in the current study with potential to have endogenous relationships with the dependent variables, is the percentage voting rights/voting power of the single biggest blockholder (VP_BH). Due to the one-share one-vote rule of the Australian market, this variable also represents large blockholdings, and therefore concentrated ownership and potentially large controlling ownership.

In addition, the data for this study shows that the percentage voting rights/voting power of the single biggest blockholder can be quite substantial at over 65% in some instances. Therefore this variable has the potential to have endogenous relationships with both idiosyncratic volatility and firm performance. Therefore this variable is treated as endogenous in the 2SLS regression equations then tested for endogeneity.

The summary results of the endogeneity test show that the difference in the j-statistics is positive, and the probability for the difference in the j-statistics is 0.4507 and insignificant. The null hypothesis for this test states that the variable being tested is not endogenous. Hence, as the probability sign for the difference in the j-stats for this test is 0.4507, and insignificant, the null cannot be rejected.

Therefore, according to this test, the percentage voting rights/voting power of the single biggest blockholder (VP_BH) is not endogenous. It can be taken then that VP_BH is not endogenous and does not have an endogenous relationship with the dependent
variable, idiosyncratic volatility (IVOL). Hence, the relationship between VP_BH and IVOL is not determined within the model, nor is there a feedback relationship between the two. Therefore, the results of the endogeneity test, and the consequent non-rejection of the null hypothesis, indicates that both the OLS estimation and the 2SLS estimation are efficient. The estimation outputs of both the OLS and 2SLS regressions are analysed and compared.

The results of the pooled 2SLS regression analysis of idiosyncratic volatility, ownership and board characteristics, depicted in Table 4.5 above, show a robust adjusted $R^2$ of 52.68%. The intercept is positive and significant at the 1% level, the F-statistic is significant ($p$-value 0.00), and the J-statistic is zero. The number of observations is 666.

**Key Findings**

The key findings of this model are consistent with the previous pooled regression analysis for idiosyncratic volatility (IVOL), ownership and board characteristics (see Table 4.4). Institutional ownership (O_INST) and insider ownership (O_INSDR) are again negatively correlated with idiosyncratic volatility and highly significant. The percentage voting power/voting rights of the single biggest blockholder (VP_BH) is positively correlated with idiosyncratic volatility and highly significant. The total percentage of non-executive directors (B_NEDS) is negatively correlated and significant. The percentage of women on the board (B_GD) is negatively correlated with idiosyncratic volatility and highly significant. The average number of other corporate affiliations of the board member (B_AFF) is positively correlated and highly significant. Board size (B_SZE) is negatively correlated and highly significant. Overall discussion of the analysis of results for this regression is much the same as for the OLS regression for idiosyncratic volatility, ownership and board characteristics previously conducted. Therefore, only the results and the significance of the results for this 2SLS regression analysis are discussed below.

**Ownership and Ownership Structure**

*Institutional Ownership (O_INST) and Insider Ownership (O_INSDR)*

As previously found, both institutional ownership and insider ownership are negatively correlated with idiosyncratic volatility and highly significant at the 1% level. The regression statistics are robust and similar to the previous OLS idiosyncratic volatility regressions. This confirms clear relationships between both institutional ownership and idiosyncratic volatility, and also between insider ownership and idiosyncratic volatility.
Voting Rights/Voting Power of the Single Biggest Blockholder (VP_BH)

The percentage voting power of the single biggest blockholder is once again positively correlated with idiosyncratic volatility and highly significant at the 1% level. The regression statistics for this variable are robust and similar to the corresponding results from the previous OLS regression for idiosyncratic volatility on ownership structure and board characteristics. Therefore a clear relationship is confirmed between the percentage voting power of the single biggest blockholder and idiosyncratic volatility.

Board Structure and Composition

Non-executive Directors (B_NEDS)

The percentage of non-executive directors on a corporate board is once again negatively correlated with idiosyncratic volatility and significant at the 5% level. The regression coefficient and t-statistic for this variable are very similar to the corresponding results from the previous OLS regression for idiosyncratic volatility on ownership structure and board characteristics, confirming a relationship between the percentage of non-executive directors on a board and idiosyncratic volatility.

Other Corporate Affiliations (B_AFF)

The average number of other corporate affiliations of board members is again positively correlated with idiosyncratic volatility, and highly significant at the 1% level. The regression statistics for this variable are robust and very similar to the corresponding results from the previous OLS regression for idiosyncratic volatility on ownership structure and board characteristics. Therefore a clear relationship is confirmed between the average number of other corporate affiliations of the members and idiosyncratic volatility.

Gender Diversity (B_GD)

As previously found, the percentage of women on a corporate board is negatively correlated with idiosyncratic volatility. This result is highly significant at the 1% level. The regression statistics are robust and similar to the corresponding results from the previous OLS regression for idiosyncratic volatility on ownership structure and board characteristics. This confirms a clear relationship between the percentage of women on the boards of the firms in this study and idiosyncratic volatility.

Board Size (B_SZE)

Board size is again showing to be negatively correlated with idiosyncratic volatility and highly significant at the 1% level. The regression statistics for this variable are robust
and very similar to the corresponding results from the previous OLS regression for idiosyncratic volatility on ownership structure and board characteristics. Therefore a clear relationship is confirmed between board size and idiosyncratic volatility.

**Corporate Governance Score (CGSCR)**

The corporate governance score is again positively correlated with idiosyncratic volatility and significant at the 10% level. The regression coefficient and t-statistic for this variable are also very similar to corresponding values found in the previous OLS regression for idiosyncratic volatility on ownership structure and board characteristics.

**Control Variables**

*Growth (GRW) and Firm Size (SZE)*

As found in the previous OLS regression analyses both growth and firm size are again negatively correlated with idiosyncratic volatility and both highly significant at the 1% level.

*Dichotomous Year Dummies*

Finally, YRD2010 and YRD2009, the year dummies 2010 and 2009 are positively correlated with idiosyncratic volatility and highly significant at the 1% level.

Therefore, both the OLS and 2SLS pooled regression analyses for idiosyncratic volatility, and ownership structure and board characteristics have produced very similar results, including a number of consistent and highly significant results and robust statistics.

**4.5.1.4. Annual OLS Regressions for Idiosyncratic Volatility on Corporate Governance**

The annual OLS regressions for idiosyncratic volatility on corporate governance were run to observe year on year effects on the variables. However, year-by-year regressions can be expected to produce somewhat weaker test results because the number of observations in each regression are much reduced compared to the corresponding pooled regression.

**Annual OLS Regressions for Idiosyncratic Volatility and Ownership Structure**

Table 4.6 below provides the summarised results for the annual OLS regression analyses of Idiosyncratic Volatility and Ownership Structure, yearly for the period 2011-2006. The dependent variable is IVOL. The regression equation is depicted as:
**Equation 7**

\[ IVOL = \alpha + \beta_1GRW + \beta_2SZE + \beta_3LEV + \beta_4IND + \beta_5O_XHLD + \beta_6O_INST + \beta_7O_INSDR + \varepsilon \]

Where: \( \alpha \) represents the intercept, \( \beta \) the regression coefficients; and \( \varepsilon \) is the error term. IVOL represents Idiosyncratic Volatility and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O_XHLD representing total percentage of cross held shares, O_INST representing total percentage of institutional holdings and O_INSDR which represents total percentage of shares held by insiders. All variables are described in the description of the variables in Chapter 3, Table 3.2.

As shown in Table 4.6 below the adjusted R\(^2\)s range from 27.8% to 68.41%. The intercepts for each year are highly significant at the 1% level, as are all the F-statistics (all \( p \)-values equal 0.00). Analysis and discussion of results is contained in the paragraphs below the table.

**Table 4.6 Annual OLS Results for Idiosyncratic Volatility and Ownership Structure**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.1043***</td>
<td>0.1320***</td>
<td>0.1474***</td>
<td>0.1306***</td>
<td>0.0988***</td>
<td>0.0956***</td>
</tr>
<tr>
<td>GRW</td>
<td>-0.0023</td>
<td>-0.0283***</td>
<td>-0.0034</td>
<td>-0.0092</td>
<td>-0.0080***</td>
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<td>SZE</td>
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<td>-0.0078***</td>
<td>-0.0067***</td>
<td>-0.0049***</td>
<td>-0.0048***</td>
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<tr>
<td></td>
<td>(-13.05)</td>
<td>(-11.26)</td>
<td>(-8.782)</td>
<td>(-6.745)</td>
<td>(-12.83)</td>
<td>(-12.206)</td>
</tr>
<tr>
<td>LEV</td>
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<td>0.0068</td>
<td>0.0122</td>
<td>-0.0014</td>
<td>-0.0106**</td>
<td>-0.0156***</td>
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<td></td>
<td>(-0.173)</td>
<td>(0.981)</td>
<td>(1.130)</td>
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<td>IND</td>
<td>-0.0002</td>
<td>0.0013*</td>
<td>0.0014</td>
<td>-0.0006</td>
<td>-0.0007</td>
<td>-0.0005</td>
</tr>
<tr>
<td></td>
<td>(-0.491)</td>
<td>(1.888)</td>
<td>(1.210)</td>
<td>(-0.479)</td>
<td>(-1.537)</td>
<td>(-1.073)</td>
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<tr>
<td>O_XHLD</td>
<td>0.0000</td>
<td>0.0001</td>
<td>-0.0001</td>
<td>-0.0001</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td></td>
<td>(-0.136)</td>
<td>(1.440)</td>
<td>(-0.595)</td>
<td>(-0.825)</td>
<td>(-0.342)</td>
<td>(-0.422)</td>
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<td>O_INST</td>
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<td>-0.0003***</td>
<td>-0.0006***</td>
<td>-0.0005***</td>
<td>-0.0003***</td>
<td>-0.0003***</td>
</tr>
<tr>
<td></td>
<td>(-4.353)</td>
<td>(-2.600)</td>
<td>(-2.988)</td>
<td>(-3.159)</td>
<td>(-5.463)</td>
<td>(-4.504)</td>
</tr>
<tr>
<td>O_INSDR</td>
<td>-0.0002***</td>
<td>-0.0002***</td>
<td>-0.0006*</td>
<td>-0.0002</td>
<td>-0.0001*</td>
<td>-0.0001</td>
</tr>
<tr>
<td></td>
<td>(-2.665)</td>
<td>(-1.590)</td>
<td>(-1.701)</td>
<td>(-1.258)</td>
<td>(-1.948)</td>
<td>(-0.936)</td>
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<td>Adj R(^2)</td>
<td>51.70%</td>
<td>42.29%</td>
<td>29.03%</td>
<td>27.80%</td>
<td>65.83%</td>
<td>68.41%</td>
</tr>
<tr>
<td>F-stat</td>
<td>39.692</td>
<td>27.065</td>
<td>15.084</td>
<td>13.596</td>
<td>60.459</td>
<td>63.788</td>
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<tr>
<td>F-stat Prob</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Obs (n)</td>
<td>254</td>
<td>250</td>
<td>242</td>
<td>230</td>
<td>217</td>
<td>204</td>
</tr>
</tbody>
</table>

T-statistics are given in parenthesis under the regression coefficients. Statistical significance, as measured by p-values, is shown as *, ** and *** indicating statistical significance at the 10%, 5% and 1% levels respectively. Dependent variable: IVOL: idiosyncratic volatility. Independent variables: O_XHLD: cross holdings %; O_INST: institutional holdings %; O_INSDR: insider holdings %. Control variables: GRW, SZE, LEV & IND: growth, size, leverage & industry.
Ownership Structure

Institutional Ownership (O_INST)

Institutional ownership is consistently negatively correlated with idiosyncratic volatility and highly significant for all years studied. This indicates that on average, for the firms in this study, the greater the percentage of institutional ownership, the lower the level of idiosyncratic volatility in all years.

Insider Ownership (O_INSDR)

Insider ownership is negatively correlated with idiosyncratic volatility at the 1% level in 2011 and at the 10% level in both 2009 and 2007, indicating on average, for the average firm, that greater insider ownership had the effect of reducing idiosyncratic volatility in those years.

Control Variables

Growth (GRW)

Growth is showing a negative correlation with idiosyncratic volatility at the 1% level in years 2010 and 2007, indicating that on average, for the firms in this study, the higher the growth rate in those years the lower the levels of idiosyncratic volatility.

Firm Size (SZE)

Firm size is consistently negatively correlated with idiosyncratic volatility and highly significant at the 1% level for all years studied.

Leverage (LEV)

Leverage is negatively correlated and significant at the 5% and 1% levels in 2007 and 2006 respectively.

Annual OLS Regressions for Idiosyncratic Volatility and Ownership and Board Characteristics

Table 4.7 below provides results for the annual OLS regression analyses of idiosyncratic volatility, ownership and board characteristics, yearly for the period 2011-2006. The dependent variable is IVOL. The regression equation is depicted as:
Equation 9

\[ \text{IVOL} = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O\_XHLD} + \beta_6 \text{O\_INST} + \beta_7 \text{O\_INSDR} + \beta_8 \text{VP\_BH} + \beta_9 \text{B\_NEDS} + \beta_{10} \text{B\_GD} + \beta_{11} \text{B\_AFF} + \beta_{12} \text{B\_SZE} + \beta_{13} \text{CGSCR} + \varepsilon \]

Where: \( \alpha \) represents the intercept, \( \beta \) the regression coefficients; and \( \varepsilon \) is the error term. IVOL represents idiosyncratic volatility and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage and industry.

The other independent variables are O\_XHLD representing total percentage of cross held shares, O\_INST representing total percentage of institutional holdings and O\_INSDR which represents total percentage of shares held by insiders, and VP\_BH which represents the percentage ownership/voting power of the single biggest blockholder, plus, B\_NEDS which is the total percentage of non-executive board members, B\_GD is the percentage of women on the board, B\_AFF represents the average number of other corporate affiliations of board members, B\_SZE represents the size of the board, and CGSCR which is a corporate governance score.

All of the variables are described in the description of the variables in Chapter 3, Table 3.2.

As shown in Table 4.7 below, for the annual regression results for idiosyncratic volatility, ownership and board characteristics, the adjusted \( R^2 \) s range from 23.72% to 59.01%. The intercepts for each year are highly significant at the 1\% level, as are all the regression F-statistics (all \( p \)-values equal 0.00). Analysis and discussion of results is contained in the paragraphs below the table.

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.0913 ***</td>
<td>0.1025 ***</td>
<td>0.0848 ***</td>
<td>0.0339 ***</td>
<td>0.0243 **</td>
<td>0.0964 **</td>
</tr>
<tr>
<td></td>
<td>(12.699)</td>
<td>(10.529)</td>
<td>(7.073)</td>
<td>(3.603)</td>
<td>(2.053)</td>
<td>(2.734)</td>
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<tr>
<td>GRW</td>
<td>-0.0136 ***</td>
<td>-0.0054 ***</td>
<td>-0.0069</td>
<td>0.0010</td>
<td>0.0064</td>
<td>-0.0035</td>
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<tr>
<td></td>
<td>(-3.517)</td>
<td>(-0.856)</td>
<td>(-1.610)</td>
<td>(0.376)</td>
<td>(1.342)</td>
<td>(-1.202)</td>
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<tr>
<td>SZE</td>
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<td>-0.0039 ***</td>
<td>-0.0034 ***</td>
<td>-0.0011 ***</td>
<td>-0.0005 ***</td>
<td>-0.0061 ***</td>
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<tr>
<td></td>
<td>(-6.038)</td>
<td>(-4.498)</td>
<td>(-3.137)</td>
<td>(-1.453)</td>
<td>(-0.606)</td>
<td>(-3.573)</td>
</tr>
<tr>
<td>LEV</td>
<td>-0.0060</td>
<td>0.0035</td>
<td>0.0058</td>
<td>0.0037</td>
<td>0.0049</td>
<td>0.0087</td>
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<tr>
<td></td>
<td>(-1.149)</td>
<td>(0.569)</td>
<td>(0.843)</td>
<td>(1.314)</td>
<td>(0.924)</td>
<td>(0.454)</td>
</tr>
<tr>
<td>IND</td>
<td>-0.0007 *</td>
<td>0.0012 *</td>
<td>0.0011 *</td>
<td>-0.0005</td>
<td>-0.0005</td>
<td>0.0002</td>
</tr>
<tr>
<td></td>
<td>(-1.724)</td>
<td>(1.907)</td>
<td>(1.672)</td>
<td>(-1.595)</td>
<td>(-1.432)</td>
<td>(0.196)</td>
</tr>
</tbody>
</table>
Ownership and Ownership Structure

Institutional Ownership (O_INST)

Institutional ownership is once again consistently negatively correlated with idiosyncratic volatility and highly significant at the 1% level in both 2011 and 2008 and at the 5% level in years 2010 and 2009.

Insider Ownership (O_INSDR)

Insider ownership is also negatively correlated with idiosyncratic volatility and significant at the 5% level in 2011 and 2009 and at the 10% level in 2010.
Voting Rights/Voting Power of the Single Biggest Blockholder (VP\_BH)

The percentage voting rights/voting power of the single biggest blockholder is positively correlated with idiosyncratic volatility. The results are significant at the 5% level in 2011 and at the 1% level in 2008. Therefore, on average, idiosyncratic volatility increased with the percentage voting rights/voting power of the single biggest blockholder during those years.

**Board Structure and Composition**

*Non-executive Directors (B\_NEDS)*

The results show that on average, the percentage of non-executive directors on the boards of the firms in this study is negatively correlated with idiosyncratic volatility and significant at the 10% level in 2010.

*Gender Diversity (B\_GD)*

The percentage of women on a corporate board is negatively correlated with idiosyncratic volatility and significant at the 5% level in 2010, indicating that on average, for the firms in this study, the higher the percentage of women on the board, the lower the level of idiosyncratic volatility in that year.

*Other Corporate Affiliations (B\_AFF)*

The average number of other corporate affiliations on a corporate board is positively correlated with idiosyncratic volatility and significant at the 1% level in 2010 and at the 10% level in 2011. This result indicates that on average, for the firms in this study, the higher the average number of other corporate affiliations of the board members, during those years, the higher the idiosyncratic volatility.

*Board Size (B\_SZE)*

The size of a corporate board is again showing to be negatively correlated with idiosyncratic volatility and significant at the 5% level in 2010 and at the 10% level in years 2009 and 2007. Indicating that on average, for the firms in this study, the larger the size of the corporate board the lower the level of idiosyncratic volatility.
Control Variables

Growth (GRW)

Growth is negatively correlated with idiosyncratic volatility and highly significant at the 1% level in 2011.

Firm Size (SZE)

Firm size is consistently negatively correlated with idiosyncratic volatility and highly significant at the 1% level in most years.

4.5.2. Firm Performance and Corporate Governance

This section contains the regression results, key findings and analyses of the various regressions for Tobin’s Q on corporate governance. The regression models used are based on both pooled and annual data. The Two-Stage Least Squares, instrumental variables approach, is also employed here to control for any endogeneity of the variables.

4.5.2.1. Pooled OLS Regression Analysis for Tobin’s Q and Ownership Structure

Tobin’s Q and Ownership Structure

Table 4.8 below provides the results for the pooled OLS regression analysis of Tobin’s Q and Ownership Structure for the period 2011-2006. The dependent variable is PFRM, firm performance, Tobin’s Q. The regression equation is depicted as:

Equation 2

\[ PFRM = \alpha + \beta_1GRW + \beta_2SZE + \beta_3LEV + \beta_4IND + \beta_5O\_XHLD + \beta_6O\_INST + \beta_7O\_INSDR + \beta_8YRD2010 + \beta_9YRD2009 + \beta_{10}YRD2008 + \beta_{11}YRD2007 + \beta_{12}YRD2006 + \varepsilon \]

Where: \( \alpha \) represents the intercept, \( \beta \) the regression coefficients and \( \varepsilon \) is the error term. PFRM represents performance, Tobin’s Q (TBNQ) and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O_XHLD representing total percentage of cross held shares, O_INST representing total percentage of institutional holdings, and O_INSDR which represents total percentage of shares held by insiders. There are five dichotomous variables in the form of five year dummies, YRD2010,
YRD2009, YRD2008, YRD2007 and YRD2006. All variables are described in the description of the variables, Chapter 3, Table 3.2.

Table 4.8 Pooled OLS Results for Tobin’s Q and Ownership Structure

<table>
<thead>
<tr>
<th>Dependent Variable – Tobin’s Q (TBNQ)</th>
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<tbody>
<tr>
<td>Pooled 2006-2011</td>
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<tr>
<td>Intercept</td>
<td>7.02245</td>
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<tr>
<td></td>
<td>(12.024)</td>
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<tr>
<td>GRW</td>
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<td></td>
<td>(1.791)</td>
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<td>SZE</td>
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<tr>
<td>LEV</td>
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<td>-(1.147)</td>
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<tr>
<td>IND</td>
<td>-0.11529</td>
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<td></td>
<td>-(0.526)</td>
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<tr>
<td>Corporate Governance Variables</td>
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<tr>
<td>O_XHLD</td>
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<tr>
<td>O_INST</td>
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<td></td>
<td>-(0.425)</td>
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<td>O_INSDR</td>
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<td></td>
<td>(1.492)</td>
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<tr>
<td>YRD2010</td>
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<td>YRD2009</td>
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<td>YRD2008</td>
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<td>-(0.645)</td>
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<tr>
<td>YRD2007</td>
<td>0.94828</td>
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<td>YRD2006</td>
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<td>(0.952)</td>
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<td>Regression Statistics</td>
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<tr>
<td>ADJ R²</td>
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<tr>
<td>F-stat</td>
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<td>Prob(F-stat)</td>
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The results of the pooled regression analysis for Tobin’s $Q$ and ownership structure depicted in Table 4.8 above show that the adjusted $R^2$ is 12.33%. The intercept is positive and significant at the 1% level, and the F-statistic is significant ($p$-value 0.00). The number of firm-level observations with all the necessary data for this analysis is 1231.

**Firm Size (SZE)**

Firm size is negatively correlated with Tobin’s $Q$, as predicted. The result is highly significant at the 1% level. This is in line with previous research that finds firm size to be negatively correlated with firm performance as measured by Tobin’s $Q$ (see for example, Hess et al. 2010).

**Growth (GRW)**

The results of this regression analysis show that growth is positively correlated with Tobin’s $Q$, and significant at the 10% level.

**Dichotomous Year Dummies**

YRD2007, the year dummy variable for 2007, is positively correlated with Tobin’s $Q$ and significant at the 1% level.

### 4.5.2.2. Pooled OLS Regression for Tobin’s $Q$, Ownership and Board Characteristics

**Tobin’s $Q$ and Ownership and Board Characteristics**

Table 4.9 below provides results for the pooled OLS regression analysis of Tobin’s $Q$, ownership and board characteristics for the period 2011-2006. The dependent variable is PFRM, firm performance, Tobin’s $Q$. The regression equation is depicted as:

**Equation 4**

\[
PFRM = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O}_\text{XHLD} + \beta_6 \text{O}_\text{INST} + \\
\beta_7 \text{O}_\text{INSDR} + \beta_8 \text{VP}_\text{BH} + \beta_9 \text{B}_\text{NEDS} + \beta_{10} \text{B}_\text{GD} + \beta_{11} \text{B}_\text{AFF} + \beta_{12} \text{B}_\text{SZE} + \\
\beta_{13} \text{CGSCR} + \beta_{14} \text{YRD2010} + \beta_{15} \text{YRD2009} + \beta_{16} \text{YRD2008} + \beta_{17} \text{YRD2007} + \beta_{18} \text{YRD2006} + \varepsilon
\]

Where: $\alpha$ represents the intercept, $\beta$ the regression coefficients; and $\varepsilon$ is the error term. PFRM represents performance, Tobin’s $Q$ (TBNQ), and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage, and industry. The other independent variables are O_XHLD...
representing total percentage of cross held shares, O_INST representing total percentage of institutional holdings and O_INSDR which represents total percentage of shares held by insiders, and VP_BH which represents the percentage ownership/voting power of the single biggest blockholder, plus, B_NEDS which is the total percentage of non-executive board members, B_GD is the percentage of women on the board, B_AFF represents the average number of other corporate affiliations of board members, B_SZE represents the size of the board, and CGSCR which is a corporate governance score. There are five dichotomous variables in the form of year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. All of the variables are described in Chapter 3, Table 3.2.

Table 4.9 Pooled OLS Results for Tobin’s Q, Ownership and Board Characteristics

<table>
<thead>
<tr>
<th>Dependent Variable – Tobin’s Q (TBNQ)</th>
<th>Pooled – 2006-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>11.56234 ***</td>
</tr>
<tr>
<td></td>
<td>(14.227)</td>
</tr>
<tr>
<td>GRW</td>
<td>0.10550</td>
</tr>
<tr>
<td></td>
<td>(0.356)</td>
</tr>
<tr>
<td>SZE</td>
<td>-0.74853 ***</td>
</tr>
<tr>
<td></td>
<td>-(10.574)</td>
</tr>
<tr>
<td>LEV</td>
<td>0.03891</td>
</tr>
<tr>
<td></td>
<td>(0.082)</td>
</tr>
<tr>
<td>IND</td>
<td>-0.06502</td>
</tr>
<tr>
<td></td>
<td>-(0.374)</td>
</tr>
<tr>
<td>Corporate Governance Variables</td>
<td></td>
</tr>
<tr>
<td>O_XHLD</td>
<td>-0.00799</td>
</tr>
<tr>
<td></td>
<td>-(1.296)</td>
</tr>
<tr>
<td>O_INST</td>
<td>-0.01955 ***</td>
</tr>
<tr>
<td></td>
<td>-(2.668)</td>
</tr>
<tr>
<td>O_INSDR</td>
<td>0.01214</td>
</tr>
<tr>
<td></td>
<td>(1.464)</td>
</tr>
<tr>
<td>VP_BH</td>
<td>0.01544 *</td>
</tr>
<tr>
<td></td>
<td>(1.907)</td>
</tr>
<tr>
<td>B_NEDS</td>
<td>-0.01119 *</td>
</tr>
<tr>
<td></td>
<td>-(1.781)</td>
</tr>
<tr>
<td>B_GD</td>
<td>0.00757</td>
</tr>
<tr>
<td></td>
<td>(0.957)</td>
</tr>
<tr>
<td>B_AFF</td>
<td>0.17409 **</td>
</tr>
<tr>
<td></td>
<td>(2.000)</td>
</tr>
<tr>
<td>B_SZE</td>
<td>0.17696 ***</td>
</tr>
<tr>
<td></td>
<td>(3.989)</td>
</tr>
<tr>
<td>CGSCR</td>
<td>-0.00074</td>
</tr>
<tr>
<td></td>
<td>-(0.193)</td>
</tr>
<tr>
<td>Year Variables</td>
<td>Coefficient</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>YRD2010</td>
<td>0.00508</td>
</tr>
<tr>
<td>YRD2009</td>
<td>-0.08771</td>
</tr>
<tr>
<td>YRD2008</td>
<td>0.73129 **</td>
</tr>
<tr>
<td>YRD2007</td>
<td>1.06701 ***</td>
</tr>
<tr>
<td>YRD2006</td>
<td>1.05399 ***</td>
</tr>
</tbody>
</table>

Regression Statistics

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adj $R^2$</td>
<td>25.68%</td>
</tr>
<tr>
<td>F-stat</td>
<td>11.94</td>
</tr>
<tr>
<td>F-stat Prob</td>
<td>0.000</td>
</tr>
<tr>
<td>Observations (n)</td>
<td>571</td>
</tr>
</tbody>
</table>


The results of the pooled regression analysis of Tobin’s $Q$, ownership and board characteristics depicted in Table 4.9 above, shows an adjusted $R^2$ of 25.68%. The intercept is positive and significant with a probability of zero. The F-statistic is significant ($p$-value 0.00). The number of firms with all the necessary data for this regression analysis is 571.

**Key Findings**

Key findings of this analysis show that institutional ownership ($O_INST$) is negatively correlated with Tobin’s $Q$ ($TBNQ$) and highly significant. The variable representing the average number of other corporate affiliations ($B_AFF$) is positively correlated with Tobin’s $Q$ and significant, while board size ($B_SZE$) is positively correlated with Tobin’s $Q$ and highly significant. An analysis of results is discussed in the following paragraphs.
Ownership and Ownership Structure

Institutional Ownership (O_INST)

In this regression analysis with the effects of the various firm-level board characteristics and other variables are included, institutional ownership is now showing to have a highly significant negative relationship with Tobin’s Q, as predicted. The regression coefficient on institutional ownership of -0.01955 is significant at the 1% level (t-statistic -2.67). This establishes a clear relationship between institutional ownership and Tobin’s Q: for the average firm, a 1 point increase in institutional ownership has the effect of reducing Tobin’s Q by approximately 1.96%. Therefore, on average, for the firms in this study, the greater the percentage of institutional ownership, the poorer the performance.

Results are mixed in the literature with regard to institutional ownership and firm performance (see for example, Agrawal and Mandelker, 1990; Agrawal and Knoeber, 1996; Craswell et al. 1997; Hartzell and Starks, 2003; Ho, 2005; Short and Keasey, 2005). Lehmann and Weigand (2000) suggest that it depends largely on the type of institutional investor as to whether institutional ownership is likely to have a positive impact firm performance. However, the results of this present study show that, on average, for firms listed on the ASX300, there is a highly significant negative relationship between institutional equity ownership and firm performance.

In the data, this variable represents long-term strategic holdings by institutions (not including pension funds). Therefore, based on the literature, an explanation for the result found in this study may be that this type of institutional investor, in this market, has a negative impact on firm performance, most likely to do the use of power and control influencing the decisions and actions of management that may not be in the best interests of the firm and the other shareholders.

Voting Rights/Voting Power of the Single Biggest Blockholder (VP_BH)

The percentage voting rights/voting power of the single biggest blockholder is positively correlated with Tobin’s Q as predicted. The regression coefficient on the voting power of the single biggest blockholder of 0.01544 is significant at the 10% level (t-statistic 1.91). This establishes a relationship between the voting power of the single biggest blockholder and Tobin’s Q: for the average firm, a 1 point increase in the voting power of the single biggest blockholder has the effect of increasing Tobin’s Q by approximately 1.54%. Therefore, on average, for the firms in this study, the greater the voting power of the single biggest blockholder the better the firm performance.

Results are mixed in the literature with regard to the effect of blockholders on firm performance (see for example, Albuquerque and Wang, 2008; Anderson et al. 2003;
Anderson and Reeb, 2003; Dignam and Galanis, 2004; Gorton and Schmid, 1999 and 2000; Hess et al. 2010). As previously discussed, the impact of large controlling shareholders on firm performance depends largely on who the blockholder is, and the size and type of holding, plus, the use of their power, control and influence over the firm (see, Denis and McConnell, 2003). Therefore, based on the literature, an explanation for the result found in this analysis may be that on average, the blockholders in this market are using their power and control for the overall good of the firm and the other shareholders, and hence impacting positively on firm performance. See Chapter 2, Section 2.3.5 for more discussion on ownership structure and ownership concentration.

**Board Structure and Composition**

*Non-executive Directors (B_NEDS)*

The variable representing the percentage of non-executive directors is negatively correlated with Tobin’s $Q$ as predicted. The regression coefficient on the percentage of non-executive directors of -0.01119 is significant at the 10% level (t-statistic -1.78). This establishes a relationship between the percentage of non-executive directors on a board and Tobin’s $Q$: for the average firm, a 1 point increase in the percentage of non-executive directors has the effect of increasing Tobin’s $Q$ by approximately 1.19%. Therefore on average, for the firms in this study, the greater the percentage of non-executive directors on a corporate board, the poorer the firm performance.

Evidence is mixed in the literature on the relationship between board independence and firm performance. A number of studies have found no convincing evidence that including a greater number of independent non-executive directors on the board improves firm performance (see for example, Bhagat and Bernard, 2002; Hermalin and Weisbach, 1991). Agrawal and Knoeber (1996) found that outside directors can have a negative effect on firm performance. However, others have found that board independence has a positive impact on firm performance, and that the inclusion of independent directors to a corporate board is central to good corporate governance (see for example, Black and Kim, 2012; Bois et al. 2009; Coles et al. 2008; Fazlzadeh et al. 2011; Uzun et al. 2004).

Based on the literature, and previous discussions, a possible explanation for the negative correlation between the percentage of non-executive directors and firm performance found in this analysis may be that non-executive directors have less experience and background knowledge of the firm. In addition, they may not be totally committed to the firm, and therefore less likely to be in favour of risky and potentially more rewarding projects, that could require greater monitoring and commitment on their part. See Chapter 2, Section 2.3.4 for more discussion on board structure.
B_AFF (Other Corporate Affiliations)

The variable representing the average number of other corporate affiliations of the board members on a corporate board is positively correlated with Tobin’s $Q$ as predicted. The regression coefficient on the average number of other corporate affiliations of the board members of 0.1741 is significant at the 5% level (t-statistic 2.00). This establishes a clear relationship between this variable and Tobin’s $Q$: for the average firm, a 1 point increase in the average number of other corporate affiliations has the effect of increasing Tobin’s $Q$ by approximately 17.41%. Therefore, the higher the average number of other corporate affiliations of the board members for the average firm, the better the firm performance.

The literature indicates that having a board with overly-busy directors can lead to a number of problems including less effective monitoring of management, weaker corporate governance, higher agency costs, and ultimately poor performance (see for example, Core et al. 1999; Fich and Shivdasani, 2006; Haniffa and Hudaib, 2006). Further, a director who holds three or more directorships is considered to be too busy. Alternatively, if they are retired, the number is 6 or more directorships (see, Core et al. 1999). However, according to the descriptive statistics based on the pooled data for this study, the average firm, has a mean number of other corporate affiliations of board members is only 1.5.

Therefore, based on the descriptive statistics and comments in the literature, Australian corporate boards are on average, not too busy. Hence, they would still have room to increase in this area, and to benefit from the positive impacts of outside corporate affiliations and associations. This is one way to explain the positive correlation between this variable and firm performance found in this study. See Chapter 2, Section 2.3.4 for more discussion on board composition.

Board Size (B_SZE)

Board size is positively correlated with Tobin’s $Q$ and highly significant. The regression coefficient on board size of 0.17696 is significant at the 1% level (t-statistic 3.99). This establishes a clear relationship between board size and Tobin’s $Q$: for the average firm, a 1 point increase in board size has the effect of increasing Tobin’s $Q$ by approximately 17.70%. Therefore, on average, the larger the size of a corporate board, the better the firm performance.

On the surface, this is a puzzling result because firm size is negatively correlated with firm performance. Hence, it would be expected that larger size firms would naturally have the larger size boards, and therefore it would be expected that board size would also be negatively correlated with firm performance. Yet it is not. However, looking at the
descriptive statistics, even though the firms in this study are in the top 300 largest Australian firms, they still tend to have relatively small boards, with an average mean number of board members of only 7.25, an average minimum of 2, and an average maximum of 20.

The literature regarding board size and firm performance has produced some mixed results, where some have found a negative association between board size and firm performance (see for example, Coles et al. 2008; Guest, 2009; Hermalin and Weisbach, 2001; Jegers, 2009; Yermack, 1996). While others report a positive association between board size and firm value and performance (see for example, Adams and Mehran, 2012; Anderson et al. 2004; Kiel and Nicholson, 2003; Li and Naughton, 2007). It is suggested that maintaining an optimum board size, facilitates better monitoring and control, direction and goal setting, greater protection of shareholder interests, and overall better corporate governance (see for example, and related discussion, Coles et al. 2008; Cotter and Silvester, 2003; Hermalin and Weisbach, 1988; Nguyen and Faff, 2006). Moreover, better monitoring and control helps to minimise agency costs (see for example, Jensen, 1993; Lipton and Lorsch, 1992) and the cost of financing (see for example, Anderson et al. 2004). Therefore, limiting board size improves board effectiveness, and ultimately, firm value and performance (see for example, Yermack, 1996).

According to the descriptive statistics discussed above, Australian firms are already limiting the size of their boards, and may still have room to move to achieve an optimal board size. Therefore, based on the literature and the descriptive statistics, one explanation for the positive correlation between board size and Tobin’s Q found in this study, is that the corporate boards in this study are actually quite small, hence those that are relatively larger compared to the others are most likely closer to an optimal size board for the size of the firm, hence the positive relationship between board size and firm performance found in this study.

**Control Variables**

*Firm Size (SZE)*

Firm size is again negatively correlated with Tobin’s Q as predicted and highly significant at the 1% level.

*Dichotomous Year Dummies*

The year dummies for 2008, 2007 and 2006, are positively correlated with Tobin’s Q. These results are significant at the 5% level, the 1% level, and 1% level respectively.
4.5.2.3. Pooled Two-Stage Least Squares (2SLS) Regression for Tobin’s Q, Ownership and Board Characteristics

As previously discussed, corporate governance variables can sometimes have endogenous relationships with the dependent variable (see for example, Hess et al. 2010; Pham et al. 2011 and 2012). Therefore, to control for any potential endogeneity of the variables, the 2SLS (instrumental variables approach) model is used. Please see Chapter 3, Section 3.9.2 for discussion on the 2SLS, instrumental variables approach.

Tobin’s Q and Ownership and Board Characteristics

Table 4.10 below provides the results for the pooled 2SLS regression analysis for Tobin’s Q, Ownership and Board characteristics for the period 2011-2006. The dependent variable is PFRM, firm performance, Tobin’s Q. The regression equation is depicted as:

Equation 6

\[
PFRM = \alpha + \beta_1 GRW + \beta_2 SZE + \beta_3 LEV + \beta_4 IND + \beta_5 O_{INST} + \beta_6 O_{INSDR} + \beta_7 VP_{BH} + \beta_8 B_{NEDS} + \beta_9 B_{GD} + \beta_{10} B_{AFF} + \beta_{11} B_{SZE} + \beta_{12} CGSCR + \beta_{13} YRD_{2010} + \beta_{14} YRD_{2009} + \beta_{15} YRD_{2008} + \beta_{16} YRD_{2007} + \beta_{17} YRD_{2006} + \varepsilon
\]

Where \( \alpha \) represents the intercept, \( \beta \) the regression coefficients and \( \varepsilon \) is the error term. PFRM represents performance, Tobin’s Q (TBNQ), and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE and LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O_INST representing total percentage of institutional holdings, O_INSDR which represents total percentage of shares held by insiders and VP_BH which represents the percentage ownership/voting power of the single biggest blockholder, plus, B_NEDS which is the total percentage of non-executive board members, B_GD is the percentage of women on the board, B_AFF represents the average number of other corporate affiliations of board members, B_SZE represents the size of the board, and CGSCR which is a corporate governance score. There are five year dummy dichotomous variables, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006.

The list of instrumental variables is comprised of: GRW, SZE, LEV, IND, O_XHLD, O_INST, O_INSDR, B_NEDS, B_GD, B_AFF, B_SZE and CGSCR, plus, five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. See Chapter 3, Section 3.9.2 for a detailed description of this model. All variables are fully described in the description of the variables, Chapter 3, Table 3.2.
<table>
<thead>
<tr>
<th>Dependent Variable – Tobin’s $Q$ (TBNQ)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intercept</strong></td>
<td>11.48541</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>(14.086)</td>
<td></td>
</tr>
<tr>
<td><strong>GRW</strong></td>
<td>0.09554</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.320)</td>
<td></td>
</tr>
<tr>
<td><strong>SZE</strong></td>
<td>-0.73178</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>(-10.325)</td>
<td></td>
</tr>
<tr>
<td><strong>LEV</strong></td>
<td>0.09232</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.193)</td>
<td></td>
</tr>
<tr>
<td><strong>IND</strong></td>
<td>-0.03792</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.217)</td>
<td></td>
</tr>
<tr>
<td><strong>Corporate Governance Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>O_INST</strong></td>
<td>-0.01814</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>(-2.530)</td>
<td></td>
</tr>
<tr>
<td><strong>O_INSDR</strong></td>
<td>0.01747</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>(2.063)</td>
<td></td>
</tr>
<tr>
<td><strong>VP_BH</strong></td>
<td>-0.00463</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.349)</td>
<td></td>
</tr>
<tr>
<td><strong>B_NEDS</strong></td>
<td>-0.01012</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.561)</td>
<td></td>
</tr>
<tr>
<td><strong>B_GD</strong></td>
<td>0.00737</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.926)</td>
<td></td>
</tr>
<tr>
<td><strong>B_AFF</strong></td>
<td>0.17809</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>(2.043)</td>
<td></td>
</tr>
<tr>
<td><strong>B_SZE</strong></td>
<td>0.18222</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>(4.019)</td>
<td></td>
</tr>
<tr>
<td><strong>CGSCR</strong></td>
<td>-0.00090</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.231)</td>
<td></td>
</tr>
<tr>
<td><strong>Year Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>YRD2010</strong></td>
<td>-0.00401</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.022)</td>
<td></td>
</tr>
<tr>
<td><strong>YRD2009</strong></td>
<td>-0.07392</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.354)</td>
<td></td>
</tr>
<tr>
<td><strong>YRD2008</strong></td>
<td>0.69669</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>(2.419)</td>
<td></td>
</tr>
<tr>
<td><strong>YRD2007</strong></td>
<td>1.00670</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>(3.229)</td>
<td></td>
</tr>
<tr>
<td><strong>YRD2006</strong></td>
<td>0.97447</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>(2.727)</td>
<td></td>
</tr>
</tbody>
</table>
Recall that corporate governance variables have potential for endogeneity of the measures (see Pham et al. 2011 and 2012; Hess et al. 2010). For instance, Hess et al. (2010) employed both OLS and 2SLS regressions models to control for potential endogenous relationships between ownership and firm performance, in particular, between a variable representing concentrated ownership and Tobin’s Q, and also a variables representing private blockholders and Tobin’s Q.

Therefore, as previously discussed, following Hess et al. (2010), in which both ownership concentration and private blockholdings were treated as endogenous – the variable identified in the current study with the greatest potential of an endogenous relationship with the dependent variable is the percentage voting rights/voting power of thesingle biggest blockholder (VP_BH). Due to the one-share one-vote rule of the Australian market, this variable also represents large blockholdings, and therefore concentrated ownership and potentially large controlling ownership.

In addition, as discussed earlier, the data for this study shows that the percentage voting rights/voting power of the single biggest blockholder can be quite substantial at over 65% in some instances. This variable has the potential to have endogenous relationships with both idiosyncratic volatility and firm performance. Therefore this variable was treated as endogenous in both 2SLS regression equations then tested for endogeneity.

The summary results of the endogeneity test following the 2SLS regression analysis for Tobin’s Q, and ownership and board characteristics, shows that the difference in the j-statistics is positive, and the probability for the difference in the j-statistics is 0.1954, and insignificant. The null hypothesis for this test states that the variable being tested is not endogenous. Hence, as the probability sign for the difference in the j-stats for this test is 0.1954, and insignificant, the null cannot be rejected.

Therefore, according to the results of this test, VP_BH is not endogenous, and it can be taken then that VP_BH does not have an endogenous relationship with the
dependent variable, Tobin’s Q. Hence, the relationship between VP_BH and Tobin’s Q is not determined within the model, nor is there a feedback relationship between the two. Therefore, the results of the endogeneity test, and the consequent non-rejection of the null hypothesis, indicates that both the OLS estimation and the 2SLS estimation are efficient. The estimation outputs for both the OLS and 2SLS regressions are analysed and compared.

The results of the pooled 2SLS regression analysis for Tobin’s Q and ownership and board characteristics depicted in Table 4.10 above, shows an adjusted R² of 24.99%. The intercept is highly significant (t-statistic 14.09). The F-statistic is significant (p-value 0.00), and the J-statistic is zero. The number firms with all of the available data necessary for this analysis are 571.

**Key Findings**

The key findings of this model are that Institutional ownership (O_INST) is negatively correlated with Tobin’s Q (TBNQ) and is significant. Insider ownership (O_INSDR) is positively correlated with Tobin’s Q. The variable representing outside corporate affiliations of the board members (B_AFF) is positively correlated with Tobin’s Q and significant. Board size (B_SZE) is positively correlated with Tobin’s Q and highly significant. An analysis of results is discussed in the following paragraphs. The main difference in the key findings of this 2SLS regression analysis compared to the findings of the previous OLS regression analysis (see, Table 4.9), are that insider ownership (O_INSDR) is now showing to be positively correlated with Tobin’s Q. A discussion of results is given below.

**Ownership and Ownership Structure**

**Institutional Ownership (O_INST)**

Institutional ownership is negatively correlated with Tobin’s Q, as predicted. The regression coefficient on institutional ownership of -0.01814 is significant at the 5% level (t-statistic -2.53). This establishes a clear relationship between institutional ownership and Tobin’s Q: for the average firm, a 1 point increase in institutional ownership has the effect of reducing Tobin’s Q by approximately 1.81%. Therefore, on average for the firms in this study, the greater the proportion of institutional ownership, the poorer the performance.

As discussed following the previous regression analysis on Tobin’s Q, the impact of institutional ownership on firm performance depends largely on the type of institutional holding (see for example, Lehmann and Weigand, 2000). As discussed earlier, the institutional ownership variable used in this study represents a long-term strategic holding.
Therefore, based on the literature, and other aspects discussed above, one explanation for the negative correlation between institutional ownership and Tobin’s $Q$ may be that this type of institutional investor has a negative impact on firm performance in this market. This is most likely due to the use of power and control, influencing management decisions that may not be in the best interests of the firm and the other shareholders.

**Insider Ownership (O_INSDR)**

Now, with the application of the 2SLS model, combined with the changed dynamics of the regression equation with the instrumental variables approach, insider ownership is now showing to be positively correlated with Tobin’s $Q$ and significant. The regression coefficient on insider ownership of 0.01747 is significant at the 5% level (t-statistic 2.06). This establishes a clear relationship between insider ownership and Tobin’s $Q$: for the average firm, a 1 point increase in insider ownership has the effect of increasing Tobin’s $Q$ by approximately 1.75%. Therefore, for the average firm in this study, the greater the percentage of insider ownership, the better the firm performance.

Corporate governance literature indicates that greater insider ownership typically improves firm performance (see for example, Agrawal and Knoeber, 1996; Ang et al. 2000; Ho, 2005). However, it is suggested that it depends largely on the type of firm, the unique characteristics and situation of the firm, who the equity holder is, the type of holding, and the actual percentage of insider ownership (see for example, McConnell and Servaes, 1990; Mórcz et al. 1988; Mórcz, 1995; Muller and Warneryd, 2001). For instance, management often become entrenched through very large and controlling ownership stakes, and this has the potential to increase agency problems and costs, and to impact negatively on firm performance (see for example, McConnell and Servaes, 1990; McConnell et al. 2008; Mórcz et al. 1988). However, it is suggested that the agency problems and costs associated with large entrenched insiders are often offset by the benefits associated with the alignment of management and shareholders’ interests that comes with this type of ownership (see, Hillier and McColgan, 2008; Short and Keasey, 1999).

According to the data for this study, firms listed on the ASX300, have on average, only a 4.4% component of total shares on issue held by insiders. Therefore, insider ownership is no longer the major issue it once was for Australian listed firms (see for example, Clifford and Evans, 1997; Fleming, 2003).

Therefore, based on the literature and other aspects discussed above, one explanation for the positive correlation between insider ownership and firm performance found in this study, may be that the positive effects of incentive alignment that is often a
feature of large insider holdings, outweighs any negative effects of this type of ownership for firms, in this market.

**Board Structure and Composition**

*Other Corporate Affiliations (B_AFF)*

The average number of other corporate affiliations of the board members is found to be positively correlated with Tobin’s $Q$ and significant. The regression coefficient on the average number of other corporate affiliations of 0.1781 is significant at the 5% level (t-statistic 2.04). This establishes a clear relationship between the average number of other corporate affiliations and Tobin’s $Q$: for the average firm, a 1 point increase in the average number of other corporate affiliations of the board members has the effect of increasing Tobin’s $Q$ by approximately 17.81%. Therefore, the greater the average number of other corporate affiliations among the board members of the average firm, the better the firm performance.

As discussed following the previous regression analysis, an explanation for this result is that most of the members on the corporate boards in this study are not too busy. This is because the descriptive statistics from the pooled data shows that for the average firm, the mean number of other corporate affiliations of board members is only 1.5. Therefore, on average, board members on Australian corporate boards are not too busy. However, the limited average number of outside corporate affiliations and associations that the board members are involved in appears to be beneficial for the firms in this study. See Chapter 2, Section 2.3.4 for more discussion.

*Board Size (B_SZE)*

Board size is again showing to be positively correlated with Tobin’s $Q$ and highly significant. The regression coefficient on board size of 0.1822 is significant at the 1% level (t-statistic 4.02). This establishes a clear relationship between board size and Tobin’s $Q$: for the average firm, a 1 point increase in board size has the effect of increasing Tobin’s $Q$ by approximately 18.22%. Therefore, on average, the larger the corporate board of the firms in this study, the better the firm performance.

As discussed following the previous regression analysis, Australian firms listed on the ASX300 have the potential to perform even better with relatively larger, more optimal size boards than they presently have. This is because the descriptive statistics for this study show that the overall mean number of directors on the average corporate board in this study is only 7, with an overall maximum mean number of directors of only 20. Hence the average board is relatively small. However, on average, those firms that have the larger
size boards compared to the other firms in the study are the better performers. This result is discussed in more detail following the OLS regression analysis on Tobin’s $Q$ and ownership and board characteristics shown in the previous section.

**Control Variables**

*Firm Size (SZE)*

As previously found, firm size is negatively correlated with Tobin’s $Q$ and highly significant at the 1% level.

*Dichotomous Year Dummies*

YRD2008, YRD2007, and YRD2006, year dummies for 2008, 2007 and 2006, are again positively correlated with Tobin’s $Q$, at the 5%, 1% and 1% levels respectively.

Therefore, both the OLS and 2SLS pooled regressions for Tobin’s $Q$ and ownership and board characteristics have produced similar significant results.

### 4.5.2.4. Annual OLS Regressions Tobin’s $Q$, and Ownership Structure

**Tobin’s $Q$ and Ownership Structure**

Table 4.11 below provides results for the annual OLS regression analyses of Tobin’s $Q$ and Ownership Structure, yearly for the period 2006 to 2011 inclusive. The dependent variable is PFRM, firm performance, Tobin’s $Q$. The regression equation is depicted as:

**Equation 8**

\[
PFRM = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O}_\text{XHLD} + \beta_6 \text{O}_\text{INST} + \beta_7 \text{O}_\text{INSDR} + \epsilon
\]

Where: $\alpha$ represents the intercept, $\beta$ the regression coefficients and $\epsilon$ is the error term. PFRM represents performance, Tobin’s $Q$ (TBNQ), and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O_XHLD, O_INST, O_INSDR, representing the total percentage cross held share holdings, total percentage institutional held shares, and total percentage of shares held by insiders respectively. A full description of the variables is contained in Chapter 3, Table 3.2.
As shown in Table 4.11 above, the annual adjusted $R^2$ measures range from 5.04% in 2008 to 21.63% in 2011. The intercepts are all positive and significant at the 1% level. All of the regression F-statistics are significant ($p$-values equal 0.00). A discussion of results is given below.

### Ownership Structure

#### Insider Ownership ($O_{INSDR}$)

Insider ownership is showing to be positively correlated with Tobin’s $Q$ in 2008 and significant at the 10% level.
Control Variables

Firm Size (SZE)

Firm size is negatively correlated with Tobin’s $Q$ and highly significant at the 1% level each year except for 2008, where it is significant at the 5% level.

Growth (GRW)

Growth is positively correlated with Tobin’s $Q$ at the 1% level in 2007.

4.5.2.5. Annual OLS Regressions for Tobin’s $Q$ and Ownership and Board Characteristics

Tobin’s $Q$ and Ownership and Board Characteristics

Table 4.12 below provides results for the annual OLS regression analysis of Tobin’s $Q$, Ownership and Board Characteristics, yearly for the period 2006 to 2011 inclusive. The dependent variable is PFRM, firm performance, Tobin’s $Q$. The regression equation is depicted as:

Equation 10

$$PFRM = \alpha + \beta_1 GRW + \beta_2 SZE + \beta_3 LEV + \beta_4 IND + \beta_5 O\_XHLD + \beta_6 O\_INST + \beta_7 O\_INSDR + \beta_8 VP\_BH + \beta_9 B\_NEDS + \beta_{10} B\_GD + \beta_{11} B\_AFF + \beta_{12} B\_SZE + \beta_{13} CGSCR + \varepsilon$$

Where: $\alpha$ represents the intercept, $\beta$ the regression coefficients; $\varepsilon$ is an error term. PFRM represents firm performance, Tobin’s $Q$, (TBNQ), and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE and LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are $O\_XHLD$ representing total percentage of cross held shares, $O\_INST$ representing total percentage of institutional holdings and $O\_INSDR$ which represents total percentage of shares held by insiders, and $VP\_BH$ which represents the percentage voting power of the single biggest blockholder, plus, $B\_NEDS$ which is the total percentage of non-executive board members, $B\_GD$ is the percentage of women on the board, $B\_AFF$ represents the average number of other corporate affiliations of board members, $B\_SZE$ represents the size of the board, and CGSCR which is a corporate governance score. All variables are fully described in the description of the variables, in Chapter 3, Table 3.2.
As shown in Table 4.12 above the adjusted coefficient of variation, adjusted $R^2$ for each year ranges from 12.24% in 2009 to 29.07% in 2010. The intercept coefficients are all significant at the 1% level. The F-statistics are all significant ($p$-values 0.00).
Key Findings

B_SZE (board size) is positively correlated with Tobin’s $Q$ in 2010 and highly significant, and also positively correlated in 2009 and 2006. Institutional ownership (O_INST) is negatively correlated with Tobin’s $Q$ in 2008. Voting rights/voting power of the single biggest blockholder (VP_BH) is positively correlated with Tobin’s $Q$ in 2008. The percentage of Cross-held shares (O_XHLD) is negatively correlated with Tobin’s $Q$ in 2006. A discussion of results is given below.

Ownership and Ownership Structure

Institutional Ownership (O_INST)

Institutional ownership is again negatively correlated with Tobin’s $Q$ and significant at the 5% level in 2008. This indicates on average for the firms in this study, that those firms with greater levels of institutional ownership did not perform as well as the others during that period.

Cross-holdings (O_XHLD)

The percentage of cross-held shares is negatively correlated with Tobin’s $Q$ and significant at the 5% level in 2006. This would indicate on average for the firms in this study that those firms with a higher percentage of cross-holdings did not perform as well as the others during that period.

Voting Rights/Voting Power of the Single Biggest Blockholder (VP_BH)

The percentage ownership/voting power of the single biggest blockholder is positively correlated and significant at the 5% level in 2008. Therefore on average for the firms in this study, the greater the percentage voting rights/voting power of the single biggest blockholder, the better the firm performance in that year.

Board Structure and Composition

Board Size (B_SZE)

Board size is positively correlated with Tobin’s $Q$ and significant at the 1% level in 2010 and at the 10% level in 2009 and 2006, indicating on average, that the firms in this study with the relatively larger size boards were the better performers during those years.
Control Variables

Growth (GRW)

Growth is positively correlated and significant at the 10% level in 2009 indicating that on average, the higher the current growth rate of the firms in this study, the better the performance during that period.

Firm Size (SZE)

As previously found and discussed, firm size is consistently negatively correlated with Tobin’s Q and highly significant in most years at the 1% level.

Leverage (LEV)

Leverage is positively correlated with Tobin’s Q in 2008, and this result is significant at the 1% level.

Robustness Tests: ROA and ROE and Corporate Governance

In the analyses ROA and ROE were regressed as robustness tests against ownership structure and board characteristics. These regressions were conducted as they were often included in the literature with Tobin’s Q. In this study most of the ROA and ROE regressions produced similar results. The only exception was for the variable representing the percentage of cross-held shares, which was positively correlated with ROA and highly significant, but had no significant relationship with ROE. The variable representing the percentage of women on the board was positively correlated with ROE and highly significant, but no significant relationship with ROA. In addition, the year dummies for years 2007 and 2006 were found to be positively correlated with ROE, but not with ROA. The adjusted R²’s for the ROA and ROE models range from between 11% and 18%. Further discussion and a presentation of the results are contained in Appendix 1.

4.5.3. Overall Discussion of Key Findings for Idiosyncratic Volatility and Corporate Governance

Institutional Ownership (O_INST) and Insider Ownership (INSDR)

As shown in the results of the various regressions for idiosyncratic volatility and ownership and board structure, both institutional ownership and insider ownership are found to be negatively correlated with idiosyncratic volatility and both highly significant.
Moreover, due to significant results and robust t-statistics, clear relationships have been established between both institutional equity ownership and idiosyncratic volatility, and also between insider ownership and idiosyncratic volatility. Therefore, for the average firm in this study, the greater the level of institutional ownership, the lower the level of idiosyncratic volatility. Further, and equally as important, for the average firm in this study, the greater the level of insider ownership, the lower the level of idiosyncratic volatility. Following a review of the literature, it appears that this is the first time that these elements of ownership structure been studied and these results found in relation to a market with internal-governance-control characteristics.

As reported in the descriptive statistics of the pooled data, the firms in this study have an average mean institutional shareholding of around 9.5% of total equity ownership, while the average percentage of insider ownership is around 4.4%. Although institutional ownership and insider ownership are different elements of ownership structure, made up of different types of equity holders, both forms of ownership in this market are long-term holdings that have incentives to monitor the firm, reduce agency problems and costs, and avoid unnecessary risk (see for example, and related discussion, Anderson et al. 2003; Anderson and Reeb, 2003; Pham et al, 2012). Therefore, based on the literature, both types of equity ownership potentially have the same end effect of reducing levels of risk for the firm. Hence, the consistent and highly significant negative relationships found between institutional ownership and idiosyncratic volatility, and also between insider ownership and idiosyncratic volatility.

**Voting Rights/Voting Power of the Single Biggest Blockholder (VP_BH)**

The percentage voting rights/voting power of the single biggest blockholder is found to be positively correlated with idiosyncratic volatility and highly significant. Therefore, for the average firm, the higher the percentage voting rights/voting power of the single biggest blockholder, the higher the level of idiosyncratic volatility. To my knowledge this is the first time this has been studied and this result found. The descriptive statistics for both the pooled and annual data show that the average percentage voting power of the single biggest blockholder is around 21%, which is quite high. Further, this has increased by approximately 11% over the years 2006-2011. As previously discussed, due to the one share, one vote rule in the Australian listed market, this variable also equates to the size of the single biggest blockholder relative to a firm’s total equity holdings.

The firms in this study are relatively large by Australian standards and therefore large enough to restrain a large controlling blockholder, while at the same time benefit from positive effects. However, there is always the risk that a controlling blockholder will
begin to exercise their power and control to the detriment of the firm and the other shareholders (see for example, Denis and McConnell, 2003; Mörck et al. 1988) and potentially leading to an increase in real and perceived levels of risk for the firm (see for example, Pham et al. 2011 and 2012). Hence, the positive correlation found between the percentage voting power of the single biggest blockholder and idiosyncratic volatility.

**Percentage of Non-Executive Directors on the Board (B_NEDS)**

The percentage of non-executive directors on a board is negatively correlated with idiosyncratic volatility and highly significant. Therefore, on average for the average firm, the greater the percentage of non-executive directors on the board, the lower the level of idiosyncratic volatility. To my knowledge this is the first time this has been studied and this result found. According to the descriptive statistics for both the annual and pooled data, there is an average mean of 78% non-executive directors on the boards of the firms in this study. This relatively high average percentage of non-executive directors has remained relatively constant of the period 2006-2011. A corporate board with a high percentage of non-executive directors can provide a degree of impartiality between directors and management. This contributes to better monitoring, and fair and objective decision making and judgements (see for example, and related discussion, Chen and Jaggi, 2001; Pass, 2004). All of these factors serve to reduce conflicts of interest and other agency problems and costs. Hence, the negative correlation found between the total percentage of non-executive directors on a corporate board and idiosyncratic volatility.

**Percentage of Women on the Board (B_GD)**

The total percentage of women on a corporate board is found to be negatively correlated with idiosyncratic volatility and highly significant. Therefore, on average for the firms in this study, the higher the percentage of women on the board, the lower the level of idiosyncratic volatility for those firms. To my knowledge this is the first time this has been studied and this result found. The descriptive statistics for the pooled data show an average mean of only 8.4% of women on a board, with the lowest of zero and the highest of around 57%. A gender balanced board is potentially better able to utilise the combined strengths and differences among the directors, leading to fresh viewpoints and new approaches. Further, this dynamic can impact on decision making, risk taking and investment choices, potentially leading to more conservative and considered decisions and actions (see for example, and related discussion, Adams and Ferreira, 2009a; Barber and Odean, 2001; Levi et al. 2013; van der Walt and Ingley, 2003). Hence, the negative correlation found between the percentage of women on a corporate board and idiosyncratic volatility.
**Average Number of Other Corporate Affiliations of the Board Members (B_AFF)**

The average number of other corporate affiliations of the board members is positively correlated with idiosyncratic volatility and highly significant. Therefore on average for the firms in this study, the higher the average number of other corporate affiliations among the board members, the higher the level of idiosyncratic volatility. To my knowledge this is the first time this has been studied and this result found. The descriptive statistics based on both the pooled and annual data show a maximum average number of other corporate affiliations of only 5.5, with a minimum of 0, and a mean average of only 1.6. The data shows that the maximum average number of other corporate affiliations has increased slightly between the years 2006 to 2011, yet the mean average has decreased slightly during that period. Thus, on average, the boards in this study contain a relatively low average number of outside corporate affiliations among their directors.

Outside corporate affiliations can provide a level of knowledge and expertise to a board, and can also help forge valuable associations that could lead to profitable contracts, and access to additional resources and information. Further, other benefits may include a greater rapport with colleagues, and greater visibility for themselves and the firm (see for example, and related discussion, Higgins and Gulati, 2003; Kiel and Nicholson, 2006). Hence, the positive correlation found between the average number of other corporate affiliations of board members, and idiosyncratic volatility.

**Board Size (B_SZE)**

Board size is found to be negatively correlated with idiosyncratic volatility and highly significant. Therefore, for the average firm in this study, the larger the size of the board the lower the level of idiosyncratic volatility. To my knowledge this is the first time this has been studied and this result found. The descriptive statistics for the pooled data show that on average, the mean board size is only 7.3 board members, with an average maximum of only 20. The statistics for the annual data show that board size has actually decreased over the years 2006 to 2011, from an average mean of 8.6 in 2006 to an average mean of 6.5 in 2011.

Larger boards are typically less communicative (see for example, Jensen, 1993; Lipton and Lorsch, 1992). Therefore, based on the literature, the relatively larger size boards in this study compared to the others will be relatively less open and communicative. Further, this would tend to restrict information flow, and hence levels of idiosyncratic volatility for the firm. This is one explanation for the negative correlation found between board size and idiosyncratic volatility.
In addition, the adjusted $R^2$s for all of the pooled regressions on idiosyncratic volatility are large, ranging between 43% and 53%. Similarly, the F-statistics for these regressions are all highly significant. In short, clear relationships have been established in this study between idiosyncratic volatility and variables based on internal corporate governance controls. These relationships are supported by highly significant regression coefficients.

4.5.4. Overall Discussion of Key Findings for Tobin’s Q and Corporate Governance

_Institutional Ownership (O_INST)_

Institutional ownership is found to be negatively correlated with Tobin’s Q, and highly significant, indicating that on average, the higher the level of institutional ownership for firms in this study, the poorer the performance of those firms. Moreover, due to significant results and robust t-statistics a clear relationship has been established between institutional equity ownership and Tobin’s Q.

As previously discussed, the impact of institutional ownership on firm performance largely depends on the type of institutional investor (see for example, Lehmann and Weigand, 2000), in that some large equity holdings can be very powerful, self-serving and controlling (see for example, Denis and McConnell, 2003).

Further, as shown in the description of the variables in Table 3.2, the institutional ownership variable used in this study represents long-term strategic holdings by institutions. Therefore, based on the literature and the description of this variable, one explanation for the negative correlation between institutional ownership and Tobin’s Q found in this study may be that this type of institutional investor has a negative impact on firm performance in this market. This is most likely due to the self-serving motives of these types of strategic holdings that may not be in the best interests of the other shareholders. Such a circumstance is consistent with the observed negative relationship between institutional ownership and Tobin’s Q.

Recall also that institutional ownership is also consistently negatively correlated with idiosyncratic volatility and highly significant. Therefore, on average for the firms in this study, the higher the level of institutional ownership, the lower the level of idiosyncratic volatility, and the poorer the firm performance.
Insider Ownership (O_INSDR)

Insider ownership is positively correlated with Tobin’s $Q$, and significant at the 5% level, indicating that the greater the percentage of insider ownership for the firms in this study, the better the performance of those firms. The literature suggests that insider ownership impacts positively on firm performance up to an optimal point for a particular firm, then beyond that point there may be problems with issues of control and entrenchment (see for example, McConnell et al. 2008; Mörck et al. 1988). In addition, the impact of insider ownership depends on a number of factors such as the type of firm, the unique characteristics and situation of the firm, the type and identity of the equity holder and the actual percentage of insider ownership (see for example, Denis and McConnell, 2003; McConnell and Servaes, 1990; Mörck et al. 1988). According to the descriptive statistics, for the average firm in this study, the average percentage of insider ownership is approximately 4.4% of total shares on issue. Therefore, based on the literature and the descriptive statistics, it is likely that the identity, size, and type of insider ownership that makes up that component of ownership structure, is beneficial for these firms. Moreover, it is also likely that the benefits of insider ownership outweigh any potential negative impacts of control and entrenchment for these firms. This is one explanation for the positive correlation found between insider ownership and Tobin’s $Q$ in this study.

Percentage voting rights/voting power of the single biggest blockholder (VP_BH)

The percentage voting rights/voting power of the single biggest blockholder is positively correlated with firm performance, indicating on average for the firms in this study, the greater the percentage voting rights/voting power of the single biggest blockholder the better the firm performance. Further, due to the one-share one-vote rule of the Australian listed market, this variable also equates to the size of the single biggest blockholder relative to a firm’s total equity holdings. The literature reports that concentrated equity ownership impacts positively on firm value and performance (see for example, Barclay and Holderness, 2012; Claessens and Djankov, 1999; Gorton and Schmid, 2000; Mörck et al. 1988; Sarkar and Sarkar, 2003). However as with all forms of ownership concentration, the impact on firm performance depends largely on who the blockholder is, the type of holding, the percentage ownership, and the intended use of power and control (see for example, Denis and McConnell, 2003; McConnell and Servaes, 1990; Mörck et al. 1988). Therefore, based on the literature and aspects discussed above, it is likely that the average firm in this study is large enough to benefit from the positive impacts of large controlling blockholders, while
managing any negative impacts. Hence the positive relationship between the voting power of the single biggest blockholder and Tobin’s $Q$.

As previously discussed, this variable is also positively correlated with idiosyncratic volatility and highly significant. Therefore the greater the voting rights/voting power of the single biggest blockholder the higher the level of idiosyncratic volatility, and the better the firm performance of the average firm.

*Percentage of Non-executive Directors on the Board (B_NEDS)*

The total percentage of non-executive directors on a corporate board is negatively correlated with Tobin’s $Q$, indicating on average, the higher the percentage of non-executive directors on a corporate board the poorer the firm performance. The descriptive statistics for the firms in this study show that the average mean percentage of non-executive directors on a board is quite high, and has remained reasonably steady over the years 2006 to 2011 at around 80%. It is suggested in the literature, that non-executive directors may have limited involvement in the firm, less time to commit to the firm and its projects, and not as much say in decision making as executive directors (see for example, Adams *et al.* 2005).

Based on the literature, and aspects discussed above, non-executive directors may not have as much background knowledge of the firm. Therefore, non-executive directors may not be as willing to support decisions to invest in risky and potentially rewarding projects that would require greater time, commitment and monitoring on their part. Hence, the negative correlation found between the percentage of non-executive directors and Tobin’s $Q$.

Recall also that this variable is also negatively correlated with idiosyncratic volatility. Therefore, on average for the firms in this study, the greater the percentage of non-executive directors, the lower the level of idiosyncratic volatility and the poorer the firm performance.

*Average Number of Other Corporate Affiliations among the Board Members (B_AFF)*

The average number of other corporate affiliations of the board members on a corporate board is positively correlated with Tobin’s $Q$. Therefore, on average for the firms in this study, the larger the average number of other corporate affiliation among the board members, the better the firm performance.

The descriptive statistics for the pooled data shows that on average for the firms in this study, the average number of other corporate affiliations of the board members is only a relatively low value of 1.56. It is suggested that a higher average number of other
corporate affiliations among the board members adds to the level of knowledge and expertise of the board. Moreover, outside corporate affiliations can enable directors to form valuable associations, gain access to additional resources and information, and win profitable contracts (see for example, Higgins and Gulati, 2003; Kiel and Nicholson, 2006). Based on the literature and the descriptive statistics discussed above, Australian corporate board members tend not to be too busy and so, their firms can benefit from the positive impacts of outside corporate affiliations. Hence, the positive correlation found between the average number of outside corporate affiliations among the board members and Tobin’s $Q$.

As discussed previously, this variable is also positively correlated with idiosyncratic volatility. Therefore, the greater the average number of other corporate affiliations among the board members, the higher the level of idiosyncratic volatility and the better the firm performance for the average firm.

**Board Size (B_SZE)**

Board size is positively correlated with Tobin’s $Q$ and highly significant. This would indicate on average for firms in this study, the larger the size of the board, the better the performance. As discussed, the descriptive statistics for the pooled data show that on average, the mean board size is only 7.3 board members, with a maximum of only 20. The statistics for the annual data show that board size has actually decreased over the years 2006 to 2011, from an average mean of 8.6 in 2006 to an average mean of 6.5 in 2011.

Even though communication may be poorer with larger size boards, bigger boards can offer increased monitoring which may reduce agency problems and costs (see for example, Jensen, 1993; Lipton and Lorsch, 1992). In addition, according to the descriptive statistics discussed above, Australian firms are already limiting the size of their boards, and therefore not faced with some of the problems and negative impacts of large boards. It is likely that the firms in this study are benefiting from the positive aspects of a relatively larger size board compared to the others, while at the same time, still limiting their boards to a close to optimal size with room for expansion. Hence, the positive correlation found between board size and Tobin’s $Q$ in this study.

In addition, the adjusted $R^2$’s for the pooled data regressions on Tobin’s $Q$ range from 12% to 25%. The relationships established in this study between Tobin’s $Q$ and variables based on internal governance controls are supported by significant regression coefficients and robust statistics.
4.5.5. Key Findings that Imply a Link between Corporate Governance, Idiosyncratic Volatility and Firm Performance

The regression results for idiosyncratic volatility on corporate governance, and also Tobin’s $Q$ on corporate governance, reveal some significant and comparable findings that point to a potential link between corporate governance, idiosyncratic volatility and firm performance.

There are four main factors contributing to a link between corporate governance, idiosyncratic volatility and firm performance. The first contributing factor is the consistent and highly significant negative correlation found to exist between institutional equity ownership, and both idiosyncratic volatility and Tobin’s $Q$. Therefore, due to highly significant regression coefficients and robust statistics, these results indicate that on average, for the firms in this study, the higher the percentage of institutional ownership, the lower the level of idiosyncratic volatility and the poorer the firm performance. This finding implies a connection between institutional equity ownership, idiosyncratic volatility, and firm performance.

Secondly, this study has found that the average number of other corporate affiliations of the board members is positively correlated with both idiosyncratic volatility and Tobin’s $Q$. Hence, due to significant regression coefficients, these results indicate that, the greater the average number of other corporate affiliations of the board members, the higher the level of idiosyncratic volatility and the better the firm performance. This finding implies a connection between the average number of other corporate affiliations of the board members, idiosyncratic volatility, and firm performance.

Thirdly, the total percentage of non-executive directors on a corporate board is found to be negatively correlated with both idiosyncratic volatility and Tobin’s $Q$. Due to significant regression coefficients, these results indicate that the higher the percentage of non-executive directors on the board, the lower the level of idiosyncratic volatility and the poorer the firm performance. This finding suggests an association between the total percentage of non-executive directors, idiosyncratic volatility, and firm performance.

Fourthly, the percentage voting rights/voting power of the single biggest blockholder is found to be positively correlated with both idiosyncratic volatility and Tobin’s $Q$. As a result of significant regression coefficients, the regression evidence indicates that the greater the voting rights/voting power of the single biggest blockholder, the higher the level of idiosyncratic volatility and the better the firm performance. This finding suggests a connection between the percentage voting rights/voting power of the single biggest blockholder, idiosyncratic volatility, and firm performance.

Conclusions based on the main findings and preliminary conclusions discussed in this section are expanded further in Chapter 5. A depiction of significant findings that
imply a link between corporate governance, idiosyncratic volatility, and firm performance is contained in Table 4.13 below.

**Table 4.13 Summary of Significant Findings Implying a Link between Corporate Governance and Idiosyncratic Volatility and Firm Performance**

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<td>B_GD</td>
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<td>.***</td>
<td>.***</td>
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<td>YRD2010</td>
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</tr>
<tr>
<td>N</td>
<td>1390</td>
<td>666</td>
<td>666</td>
</tr>
<tr>
<td>ADJ R²</td>
<td>43.35%</td>
<td>52.76%</td>
<td>52.68%</td>
</tr>
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</table>

Statistical significance is shown as *, **, and *** indicating statistical significance at the 10%, 5% and 1% levels respectively. Dependent variables: IVOL: idiosyncratic volatility; TBNQ: Tobin’s Q. Independent variables: O_XHLD: cross holdings %; O_INST: institutional holdings %; O_INSDDR: insider holdings %; VP_BH: voting blockholder %; B_NEDS: non-executive directors %; B_GD: women directors %; B_AFF: corporate affiliations Avg; B_SZE: board size; CGSCR: CG score. Control variables: GRW, SZE, LEV: IND: growth, size, leverage, industry.

**4.6. Summary and Conclusions**

Chapter 4 has presented, analysed and discussed results and findings of the various regression analyses on the relationship between idiosyncratic risk and corporate governance, and also firm performance and corporate governance. In addition, the chapter has identified and discussed key findings and established relationships in support of a corporate governance-to-idiosyncratic volatility-to-firm performance link. Conclusions
based on the key findings are expanded further in Chapter 5. The main findings and conclusions of this chapter are summarised below.

**Idiosyncratic Volatility and Corporate Governance**

This study has produced a number of key findings. The most important and significant of these findings include consistent and highly significant negative correlations found between idiosyncratic volatility and institutional equity ownership, and also between idiosyncratic volatility and insider ownership. Both of these results are highly significant at the 1% level. Both board size and the percentage of women on a corporate board are negatively correlated with idiosyncratic volatility and both are highly significant at the 1% level. The variable representing the voting rights/voting power of the single biggest blockholder is positively correlated with idiosyncratic volatility and highly significant at the 1% level. The average number of outside corporate affiliations of the board members is also positively correlated with idiosyncratic volatility and highly significant at the 1% level. Finally, the variable representing the percentage of non-executive directors on a corporate board is negatively correlated with idiosyncratic volatility and significant at the 5% level.

Thus, a number of clear and strong relationships have been established between idiosyncratic volatility and variables based on internal governance controls. Therefore, it is concluded that there is a clear and strong relationship between idiosyncratic volatility and corporate governance in terms of internal governance controls based on board structure and composition and also ownership and ownership structure in the context of a market with internal-governance-control characteristics. This is the primary focus of the study and the basis of Research Question 1.

**Firm Performance (Tobin’s Q) and Corporate Governance**

The Tobin’s Q regressions have also produced a number of key findings, these include, a consistently significant negative correlation found between Tobin’s Q and institutional equity ownership. There is a significant positive relationship between Tobin’s Q and insider ownership. There are consistently significant positive relationships between Tobin’s Q and board size, and also Tobin’s Q and the variable representing the average number of other corporate affiliations among the board members. The percentage voting power/voting rights of the single biggest blockholder is positively correlated with Tobin’s Q and significant, while the percentage of non-executive directors on a corporate board is negatively correlated with Tobin’s Q and significant.
Thus, a number of clear relationships have been established between Tobin’s $Q$ and internal governance controls based variables. Thus, it is concluded that there is a clear relationship between Tobin’s $Q$ and corporate governance in terms of internal governance controls based on board structure and composition, and also ownership and ownership structure, in the context of a market with internal-governance-control characteristics. This is the secondary focus of the study and the basis of Research Question 2.

**Relationships implying a link between Corporate Governance, Idiosyncratic Volatility and Firm Performance**

There are a number of key findings and established relationships that form the basis of four main connections implying a link between corporate governance and idiosyncratic volatility and firm performance. Firstly, there is a consistent and highly significant negative correlation found to exist between both institutional equity ownership and idiosyncratic volatility, and also institutional equity ownership and Tobin’s $Q$. This finding indicates a connection between institutional equity ownership, idiosyncratic volatility, and firm performance.

Secondly, the average number of other corporate affiliations of the board members is positively correlated with both idiosyncratic volatility, and Tobin’s $Q$. This finding indicates a connection between the average number of other corporate affiliations of the board members, idiosyncratic volatility, and firm performance.

Thirdly, the total percentage of non-executive directors on a corporate board is negatively correlated with both idiosyncratic volatility and Tobin’s $Q$. This finding indicates a connection between the total percentage of non-executive directors, idiosyncratic volatility, and firm performance.

Fourthly, the percentage voting rights/voting power of the single biggest blockholder is found to be positively correlated with both idiosyncratic volatility and Tobin’s $Q$. This finding indicates a connection between the percentage voting rights/voting power of the single biggest blockholder, idiosyncratic volatility, and firm performance.

The connections outlined above imply a link between corporate governance in terms of internal governance controls (based on board structure and ownership structure), and idiosyncratic volatility and firm performance, in the context of a market with internal-governance-control characteristics. This is an additional focus of the study and is the basis of the Sub-research Question.
**Other findings of the study**

Firm size (SZE) is persistently negatively correlated with idiosyncratic volatility and highly significant. This is consistent with previous findings of a negative relationship between idiosyncratic volatility and the size of a firm (see for example, Malkiel and Xu, 1997). Firm size (SZE) is also persistently negatively correlated with Tobin’s $Q$ and highly significant. This is consistent with previous research that finds firm size to be negatively correlated with firm performance as measured by Tobin’s $Q$ (see for example, Hess et al. 2010). Therefore, the larger the size of the firm, the lower its level of idiosyncratic volatility and the poorer its performance tends to be.

Notwithstanding, the firms in this study are listed on the ASX300, and therefore, all relatively large firms by Australian standards. However, on average, those firms that are relatively larger compared to the others, will contain relatively lower levels of idiosyncratic volatility, and will not perform as well as the others. This finding indicates a connection between firm size, idiosyncratic volatility, and firm performance as measured by Tobin’s $Q$.

In addition, growth (GRW) is consistently negatively correlated with idiosyncratic volatility and highly significant. Finally, the year dummies for 2009 and 2010 are consistently positively correlated with idiosyncratic volatility and highly significant, while the year dummies for 2006, 2007 and 2008, are consistently positively correlated with Tobin’s $Q$ and significant at the 5% level, the 1% level, and 1% level respectively.
Chapter 5  SUMMARY OF FINDINGS

5.1. Introduction

This chapter presents the conclusions of the study. Section 5.2 discusses the primary focus and aims of the study. Section 5.3 presents and discusses the main conclusions. Finally, Section 5.4 presents the final conclusions.

Based on the literature, to my knowledge the relationship between idiosyncratic risk and corporate governance has not been previously studied in the context of a market with internal governance-control-characteristics such as the Australian market. Therefore, the relationship between idiosyncratic risk and corporate governance in this context is the primary focus of this study. A secondary focus of the study is on the relationship between corporate governance and Tobin’s $Q$, in this context.

An additional focus of the study considers an implied link between corporate governance, idiosyncratic volatility and firm performance. This conjecture is supported by established relationships between particular internal-governance-control variables based on board structure and ownership structure, and idiosyncratic volatility, and comparable established relationships between these same variables and Tobin’s $Q$. Hence, this infers a link between internal governance controls, idiosyncratic volatility, and firm performance. Furthermore, as internal governance controls are fundamental to the governance of firms and markets with internal-governance-control characteristics, it is concluded that these relationships also imply a link between corporate governance, idiosyncratic risk, and firm performance.

However, the primary focus and conclusion of this study is that there is a clear and strong relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics, such as the Australian market. Moreover, the Australian market is a well-organised, well-functioning, fair and efficient market. Thus, idiosyncratic risk is relevant in such a market and is integral to good corporate governance and firm performance.

The findings and conclusions of this study are relevant for both academics and practitioners, and will contribute to the knowledge and literature on the relationship between idiosyncratic risk and corporate governance, and also to studies of both idiosyncratic risk, and corporate governance.
5.2. Primary Focus and Aims of the Study

Research is conducted into the relationship between idiosyncratic volatility and corporate governance, as well between firm performance and corporate governance. The corporate governance focus of the study is on aspects of board structure and composition, and on aspects of ownership and ownership structure. In addition, a potential link between corporate governance, idiosyncratic volatility and firm performance is observed following an analysis of regression results for both idiosyncratic volatility on corporate governance, and firm performance on corporate governance.

However, the primary focus of this study is on the relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics, therefore the main aim of the study is to examine this relationship in this context, and Research Question 1 is based on this.

A review of the literature reveals a sparseness of studies on the relationship between idiosyncratic risk and corporate governance. In this study, based on the literature, it is argued that this is particularly so for a well-functioning and efficient market that operates in an internal-governance-control system. That is, a corporate governance environment that is largely recommendations based, and that relies heavily on firm-level internal governance controls, rather than external controls for the maintenance of good corporate governance and firm performance. Further, whilst there are mergers and takeovers in this environment they are typically not common phenomena (see for example, and related discussion, Christensen et al. 2010; Kiel and Nicholson, 2003; Pham et al. 2011 and 2012).

As discussed in previous chapters, the Australian market is a market with internal-governance-control characteristics that operates in an internal-governance-control system. Thus this study has applied data drawn from firms listed under the aforementioned internal-governance-control market conditions, recommendations and requirements of the Australian Securities Exchange.

This study contributes to the knowledge and literature on the relationship between idiosyncratic risk and corporate governance, and also to studies of both idiosyncratic risk, and corporate governance.
5.3. Main Conclusions

5.3.1. Idiosyncratic Volatility and Ownership Structure

Following a review of the main findings relating to idiosyncratic volatility and ownership, a key finding of this study is that of a consistent and highly significant negative correlation between institutional equity ownership and idiosyncratic volatility. A clear negative relationship has been established between institutional equity ownership and idiosyncratic volatility. Ceteris paribus, the greater the level of institutional equity ownership, the lower the level of idiosyncratic volatility. Increased institutional ownership consequently impacts negatively on firm-level idiosyncratic volatility.

Another key finding of the study is a consistent and highly significant negative correlation between insider ownership and idiosyncratic volatility. In addition, due to highly significant and robust statistics, a clear negative relationship has been established between insider ownership and idiosyncratic volatility. All else being equal, the greater the proportion of insider ownership of a firm’s total equity holdings, the lower the level of idiosyncratic volatility for the average firm. Therefore, greater insider ownership has negative impact on idiosyncratic volatility.

The variable representing the percentage voting rights/voting power of the single biggest blockholder is consistently positively correlated with idiosyncratic volatility and highly significant. A clear positive relationship has been established between the percentage voting rights/voting power of the single biggest blockholder and idiosyncratic volatility. Ceteris paribus, for the average firm, the greater the percentage voting rights/voting power of the single biggest blockholder, the higher the idiosyncratic volatility. Hence, greater concentration of voting rights/voting power (i.e. large powerful blockholdings) impacts positively on a firm’s level idiosyncratic volatility.

In Conclusion

The corporate governance variables discussed above have clear established relationships with idiosyncratic volatility due to significant regression coefficients and robust statistics in each case. Therefore, it is concluded that corporate governance in the form of ownership and ownership structure plays an important role in firm-level idiosyncratic volatility in a market with internal-governance-control characteristics, such as the Australian market. Hence, there is a clear relationship between idiosyncratic volatility and corporate governance in a market with these characteristics.
5.3.2. **Idiosyncratic Volatility and Board Composition**

The primary findings relating to idiosyncratic volatility, and board structure and composition reveal a number of key findings such as the consistently significant negative correlation found between the variable representing the total percentage of non-executive directors on a board and idiosyncratic volatility. There is a clear established negative relationship between this variable and idiosyncratic volatility. All else being equal, the greater the total percentage of non-executive directors on a corporate board, the lower the level idiosyncratic volatility for the average firm. Therefore, a greater proportion of non-executive directors on the board, impacts negatively on firm-level idiosyncratic volatility.

The percentage of women on a corporate board is found to be consistently negatively correlated with idiosyncratic volatility and highly significant. This variable also has a clear established negative relationship with idiosyncratic volatility as evidenced by the reported regression results. Ceteris paribus, on average for the average firm, the higher the total percentage of women on a board, the lower the level of idiosyncratic volatility. Hence, a greater percentage of women on a corporate board impacts negatively on firm-level idiosyncratic volatility.

Another notable finding is the consistent and highly significant positive relationship found between the average number of other corporate affiliations of the board members, and idiosyncratic volatility. Ceteris paribus, the greater the average number of other corporate affiliations of the board members, the higher the level of idiosyncratic volatility for the average firm. Therefore, a greater number of other corporate affiliations amongst the board members impacts positively on firm-level idiosyncratic volatility.

In addition, board size is found to be consistently negatively correlated with idiosyncratic volatility, and highly significant. The regression evidence shows a clear negative relationship has been established between the total number of directors on a corporate board and idiosyncratic volatility. All else being equal, the larger the size of a corporate board, the lower the level of idiosyncratic volatility for the average firm. Therefore, increasing board size impacts negatively on firm-level idiosyncratic volatility.

*In Conclusion*

The corporate governance variables discussed above have clear established relationships with idiosyncratic volatility due to significant regression coefficients and robust statistics in each case. It is concluded therefore, that corporate governance in the form of board structure and composition plays a key role in firm-level idiosyncratic volatility in a market with internal-governance-control characteristics, such as the Australian market. Hence, there is a clear relationship between idiosyncratic volatility and corporate governance in a market with these characteristics.
Thus, it is concluded that this study has established a clear and strong relationship between idiosyncratic risk and corporate governance in the context of a market with internal-governance-control characteristics, such as the Australian market. Moreover, the Australian market is a well-organised, well-functioning, fair and efficient market. Thus, idiosyncratic risk is relevant in such a market and is integral good corporate governance.

5.3.3. Tobin’s Q and Ownership Structure

The primary findings relating to Tobin’s Q, and ownership, reveal that institutional equity ownership is negatively correlated with Tobin’s Q, and significant. Ceteris paribus, on average, the greater the proportion of institutional equity ownership, of a firm’s total equity holdings, the poorer the firm performance. Therefore, increased institutional ownership has a negative effect on firm performance.

On the other hand, insider ownership is found to be positively correlated with Tobin’s Q. Ceteris paribus, on average, the greater the proportion of insider ownership, of a firm’s total equity holdings, the better the firm performance. Hence, increased insider ownership has a positive effect on firm performance.

The variable representing the percentage voting rights/voting power of the single biggest blockholder is positively correlated with Tobin’s Q, and significant. Ceteris paribus, the higher the percentage voting rights/voting power of the single biggest blockholder, the better the performance of the average firm. Therefore, greater concentrated voting rights/voting power (ie. powerful blockholders) impacts positively on firm performance.

In Conclusion

Due to significant regression coefficients and robust statistics, the corporate governance variables discussed above have clearly established relationships with Tobin’s Q. It is concluded therefore, that corporate governance in the form of ownership and ownership structure, plays an important role in firm performance, particularly in a market such as the Australian market which is a market identified to have internal-governance-control characteristics.

5.3.4. Tobin’s Q and Board Composition

A review of the main findings relating to board structure and composition and Tobin’s Q, shows that the total percentage of non-executive directors on a corporate board
is negatively correlated with Tobin’s $Q$. All else being equal, for the typical firm, the higher the percentage of non-executive directors on the board, the poorer the performance of the firm. Therefore, a greater percentage of non-executive directors on a board impacts negatively on firm performance.

The variable representing the average number of other corporate affiliations among the members of a corporate board is consistently and significantly positively correlated with Tobin’s $Q$. Ceteris paribus, for the average firm, the higher the average number of other corporate affiliations among the board members, the better the firm performance. Therefore, a greater number of other corporate affiliations among the directors impacts positively on firm performance.

Board size is consistently positively correlated with Tobin’s $Q$ and highly significant. All things the same, for the average firm in this study, the larger the size of a board the better the firm performance. Hence, increased board size impacts positively on firm performance.

**In Conclusion**

Due to significant regression coefficients and robust statistics, all of the corporate governance variables discussed above have clearly established relationships with Tobin’s $Q$. Therefore, it is concluded that corporate governance in the form of board structure and composition, plays an important role in firm performance, particularly in a market such as the Australian market which is identified to have internal-governance-control characteristics.

**5.3.5. Link between Corporate Governance, Idiosyncratic Volatility and Firm Performance**

*Institutional Ownership (O_INST)*

Clear negative relationships have been established between institutional ownership and idiosyncratic volatility, and also between institutional ownership and Tobin’s $Q$. Therefore, greater institutional ownership has the effect of reducing levels of idiosyncratic volatility while at the same time, impacting negatively on firm performance. This implies a connection between institutional ownership, idiosyncratic volatility, and firm performance. Further, ownership structure is an important element of internal governance control, and therefore an important element of corporate governance for firms and markets with internal-governance-control characteristics, such as the Australian market. Therefore, this also implies a link between corporate governance and idiosyncratic risk and firm performance.
Voting Rights/Voting Power of the Single Biggest Blockholder (VP_BH)

Clear positive relationships have been established between the percentage voting power of the single biggest blockholder and idiosyncratic volatility, and also between the percentage voting power of the single biggest blockholder and Tobin’s Q. Therefore, a greater concentration of voting power has the effect of increasing levels of idiosyncratic volatility while at the same time, impacting positively on firm performance. This implies a connection between the voting power of the single biggest blockholder, and idiosyncratic volatility, and firm performance. Further, ownership structure is an important element of internal governance control, and therefore an important element of corporate governance for firms and markets with internal-governance-control characteristics, such as the Australian market. Therefore, this also implies a link between corporate governance, idiosyncratic risk, and firm performance.

Non-executive Directors (B_NEDS)

Clear negative relationships have been established between the total percentage of non-executive directors and idiosyncratic volatility, and also between the total percentage of non-executive directors and Tobin’s Q. Therefore, a greater proportion of non-executive directors has the effect of reducing levels of idiosyncratic volatility while at the same time, impacting negatively on firm performance. This implies a connection between the percentage of non-executive directors, and idiosyncratic volatility, and firm performance. Further, board structure is an important element of internal governance control, and therefore an important element of corporate governance for firms and markets with internal-governance-control characteristics, such as the Australian market. Therefore, this also implies a link between corporate governance, and idiosyncratic risk, and firm performance.

Other Corporate Affiliations of the Board Members (B_AFF)

Clear positive relationships have been established between the average number of other corporate affiliations among the board members and idiosyncratic volatility, and also between the average number of other corporate affiliations and Tobin’s Q. Therefore, a greater average number of other corporate affiliations among the board members has the effect of increasing levels of idiosyncratic volatility while at the same time impacting positively on firm performance. This implies a connection between the average number of other corporate affiliations, idiosyncratic volatility, and firm performance. Further, board structure is an important element of internal governance control, and therefore an important element of corporate governance for firms and markets with internal-governance-control
characteristics, such as the Australian market. Therefore, this also implies a link between corporate governance, and idiosyncratic risk, and firm performance.

In Conclusion

The main findings and conclusions of this study have established clear relationships that lead to connections between particular internal-governance-control variables (based on board structure and ownership structure) and idiosyncratic volatility and firm performance. Therefore, as internal-governance-controls based on board structure and ownership structure are important elements of corporate governance for firms and markets with internal-governance-control characteristics, it is therefore concluded that this also implies a link between corporate governance, idiosyncratic risk, and firm performance.

5.4. Final Conclusions

The primary conclusion of this study is that there is a clear relationship between idiosyncratic risk and corporate governance in a market with internal-governance-control characteristics. This conclusion addresses Research Question 1. The secondary conclusion of the study is that there is a relationship between Tobin’s Q and corporate governance, also in this context. This conclusion addresses Research Question 2. Thus, based on these conclusions, a link between corporate governance, idiosyncratic volatility, and firm performance is implied, which addresses the Sub-research Question.

The primary conclusion of a relationship between idiosyncratic risk and corporate governance is based on clear and strong relationships established in this study between idiosyncratic volatility and a number of internal-governance-control variables based on board structure and composition, and ownership and ownership structure. The primary conclusion of this study is supported by highly significant regression coefficients and robust statistics. A relationship between idiosyncratic risk and corporate governance has implications for fund managers and investors alike, for the identification well governed, superior performing firms, for a given level of idiosyncratic risk. Moreover, firm-level idiosyncratic risk may be identified by examining firm-specific, internal-governance control-structures and characteristics. Thus, adding a new dimension to the predictive abilities of idiosyncratic volatility for investment returns, firm value and performance.

The secondary conclusion of a relationship between firm performance and corporate governance is based on relationships established in this study between Tobin’s Q and particular internal-governance-control variables based on board structure and composition, and ownership and ownership structure. The secondary conclusion of this
A relationship between Tobin’s $Q$ and corporate governance also has implications for fund managers and investors for the identification of superior performing firms, in that, better performing firms may also be identified by examining firm-specific, internal governance control structures and characteristics.

In addition, the main conclusions of this study also imply a link between corporate governance, idiosyncratic risk, and firm performance. This implied link is based on relationships established in the study, between particular internal-governance-control variables based on both board structure and ownership structure, and idiosyncratic volatility, and comparable relationships also determined between these same variables and Tobin’s $Q$. The implication of a link between corporate governance, idiosyncratic risk, and firm performance, presents a new challenge. Hence, development of this link is an area for ongoing future research.

Most notably however, this study concludes that there is a clear and strong relationship between idiosyncratic risk and corporate governance in the context of internal governance controls based on board structure and composition, and on ownership and ownership structure. Thus, there is a clear and strong relationship between idiosyncratic risk and corporate governance in the context of a well-organised, efficient market such as the Australian market, which operates in an internal-governance-control system. Therefore, this study adds a valuable contribution to the knowledge and literature on the relationship between idiosyncratic risk and corporate governance, while also contributing to the literature on idiosyncratic risk and to the literature on corporate governance.
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Appendices

Appendix 1 – Regression Results for ROA and ROE

1. Performance (ROA and ROE) and Corporate Governance

The following regression analyses are conducted as robustness tests and to compare the results of the accounting based performance measures of ROA and ROE, to the market based performance measure of Tobin’s $Q$.

The results of the regression analyses using Performance (ROA) as the dependent variable, and ownership and board characteristics as the independent variables, is shown and discussed below. This is followed by the depiction and discussion of results of regressions run on Performance (ROE) as the dependent variable and the ownership and board characteristics independent variables.

2. Pooled OLS Regressions for Performance (ROA) and Ownership Structure

ROA and Ownership Structure

The pooled regression analysis described below for ROA and ownership structure is conducted for robustness testing and for comparison of results with performance measured by Tobin’s $Q$, and ownership structure. Table 6.1 below provides results for the pooled OLS regression analysis of ROA and Ownership Structure for the period 2011-2006. The dependent variable is firm performance, PFRM (ROA). The regression equation is depicted as:

\[ PFRM = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O}_\text{XHLD} + \beta_6 \text{O}_\text{INST} + \beta_7 \text{O}_\text{INSDR} + \beta_8 \text{YRD}2010 + \beta_9 \text{YRD}2009 + \beta_{10} \text{YRD}2008 + \beta_{11} \text{YRD}2007 + \beta_{12} \text{YRD}2006 + \varepsilon \]

Where: $\alpha$ represents the intercept, $\beta$ the regression coefficients and $\varepsilon$ is the error term. PFRM represents performance (ROA), and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O_XHLD representing total percentage of cross held shares, O_INST representing total percentage of institutional holdings, and O_INSDR which represents total percentage of shares held by
insiders. There are five dichotomous variables in the form of five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. All of the variables are described in the description of the variables, Chapter 3, Table 3.2.

Table A.1 Pooled OLS Results for ROA and Ownership Structure

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<tr>
<td>Intercept</td>
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<tr>
<td></td>
<td>-(14.521)</td>
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<td>GRW</td>
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<td>(6.236)</td>
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<td>SZE</td>
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<td></td>
<td>(14.097)</td>
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<tr>
<td>LEV</td>
<td>-0.18640 ***</td>
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<tr>
<td></td>
<td>-(3.548)</td>
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<tr>
<td>IND</td>
<td>-0.00694</td>
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<td>-(1.314)</td>
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<td>Corporate Governance Variables</td>
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<tr>
<td>O_INST</td>
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<td>(3.389)</td>
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<tr>
<td>O_INSDR</td>
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<td></td>
<td>(0.279)</td>
</tr>
<tr>
<td>Regression Statistics</td>
<td></td>
</tr>
<tr>
<td>ADJ R²</td>
<td>18.16%</td>
</tr>
<tr>
<td>F-stat</td>
<td>26.91</td>
</tr>
<tr>
<td>Prob(F-stat)</td>
<td>0.000</td>
</tr>
<tr>
<td>Observations</td>
<td>1402</td>
</tr>
</tbody>
</table>

T-statistics are given in parenthesis. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.
As shown in Table A.1 above for the pooled OLS regression of ROA and ownership the adjusted $R^2$ is 18.16%. The intercept coefficient is negative with a $p$-value of 0.00. The F-statistic is significant, with a $p$-value of 0.00. The number of firms with the necessary available data for the regression analysis is 1402. The findings of this model and comparisons with the Tobin’s $Q$ regression results are discussed in the paragraphs below.

**Ownership Structure**

*Crossholdings, institutional ownership, and insider ownership*

Crossholdings, institutional ownership and insider ownership are all positively correlated with ROA and all highly significant at the 1% level. These results indicate that on average, for the Australian listed firms in this study, the greater the percentage of cross-held shares, and/or institutional holdings, and/or shares held by insiders, the better the ROA for those firms. In contrast, crossholdings, institutional ownership, and insider ownership do not show any significant relationships with Tobin’s $Q$, in the regression analysis for Tobin’s $Q$ and Ownership Structure.

**Control Variables**

*Growth and Size*

Growth and size are positively correlated with ROA and both highly significant at the 1% level.

*Leverage*

Leverage is negatively correlated with ROA and also highly significant at the 1% level.

*Dichotomous Year Dummies*

The analysis shows a negative correlation between return on assets and the year dummy for 2009. The result is highly significant at the 1% level.
3. Pooled OLS Regressions for Performance (ROA), Ownership and Board Characteristics

**ROA, Ownership and Board Characteristics**

The pooled regression analysis described below for ROA, ownership structure and board characteristics, is conducted as a robustness test and for comparison of results with performance as measured by Tobin’s $Q$, ownership structure, and board characteristics. Table A.2 below provides results for the pooled OLS regression analysis of ROA, Ownership and Board characteristics for the period 2011-2006. The dependent variable is PFRM (ROA). The regression equation is depicted as:

**Equation 4**

\[
PFRM = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O_XHLD} + \beta_6 \text{O_INST} + \\
\beta_7 \text{O_INSDDR} + \beta_8 \text{VP_BH} + \beta_9 \text{B_NEDS} + \beta_{10} \text{B_GD} + \beta_{11} \text{B_AFF} + \beta_{12} \text{B_SZE} + \\
\beta_{13} \text{CGSCR} + \beta_{14} \text{YRD2010} + \beta_{15} \text{YRD2009} + \beta_{16} \text{YRD2008} + \beta_{17} \text{YRD2007} + \beta_{18} \text{YRD2006} + \epsilon
\]

*Where: $\alpha$ represents the intercept, $\beta$ the regression coefficients; and $\epsilon$ is the error term. PFRM represents performance (ROA) and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage, and industry. The other independent variables are O_XHLD representing total percentage of cross held shares, O_INST representing total percentage of institutional holdings and O_INSDDR which represents total percentage of shares held by insiders, and VP_BH which represents the percentage ownership/voting power of the single biggest blockholder, plus B_NEDS which is the total percentage of non-executive board members, B_GD is the percentage of women on the board, B_AFF represents the average number of other corporate affiliations of board members, B_SZE represents the size of the board, and CGSCR which is a corporate governance score. There are five dichotomous variables in the form of five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. All of the variables are fully described in the description of the variables, Table 3.2.*
Table A.2 Pooled OLS Results for ROA, Ownership and Board Characteristics

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.24418 ***</td>
</tr>
<tr>
<td></td>
<td>-(3.918)</td>
</tr>
<tr>
<td>GRW</td>
<td>0.14377 ***</td>
</tr>
<tr>
<td></td>
<td>(5.824)</td>
</tr>
<tr>
<td>SZE</td>
<td>0.01810 ***</td>
</tr>
<tr>
<td></td>
<td>(3.355)</td>
</tr>
<tr>
<td>LEV</td>
<td>-0.15820 ***</td>
</tr>
<tr>
<td></td>
<td>-(4.322)</td>
</tr>
<tr>
<td>IND</td>
<td>-0.00734 **</td>
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<td></td>
<td>-(2.122)</td>
</tr>
<tr>
<td>Corporate Governance Variables</td>
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</tr>
<tr>
<td>O_XHLD</td>
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<td></td>
<td>(0.088)</td>
</tr>
<tr>
<td>O_INST</td>
<td>0.00115 **</td>
</tr>
<tr>
<td></td>
<td>(2.039)</td>
</tr>
<tr>
<td>O_INSDR</td>
<td>0.00194 ***</td>
</tr>
<tr>
<td></td>
<td>(3.011)</td>
</tr>
<tr>
<td>VP_BH</td>
<td>0.00102 *</td>
</tr>
<tr>
<td></td>
<td>(1.651)</td>
</tr>
<tr>
<td>B_NEDS</td>
<td>0.00085 *</td>
</tr>
<tr>
<td></td>
<td>(1.735)</td>
</tr>
<tr>
<td>B_GD</td>
<td>0.00067</td>
</tr>
<tr>
<td></td>
<td>(1.099)</td>
</tr>
<tr>
<td>B_AFF</td>
<td>-0.00826</td>
</tr>
<tr>
<td></td>
<td>-(1.208)</td>
</tr>
<tr>
<td>B_SZE</td>
<td>-0.00131</td>
</tr>
<tr>
<td></td>
<td>-(0.381)</td>
</tr>
<tr>
<td>CGSCR</td>
<td>-0.00039</td>
</tr>
<tr>
<td></td>
<td>-(1.366)</td>
</tr>
<tr>
<td>Year Variables</td>
<td></td>
</tr>
<tr>
<td>YRD2010</td>
<td>-0.00601</td>
</tr>
<tr>
<td></td>
<td>-(0.418)</td>
</tr>
<tr>
<td>YRD2009</td>
<td>-0.01428</td>
</tr>
<tr>
<td></td>
<td>-(0.890)</td>
</tr>
<tr>
<td>YRD2008</td>
<td>-0.01025</td>
</tr>
<tr>
<td></td>
<td>-(0.473)</td>
</tr>
<tr>
<td>YRD2007</td>
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</tr>
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<td></td>
<td>(1.481)</td>
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<tr>
<td>YRD2006</td>
<td>0.00633</td>
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<td></td>
<td>(0.233)</td>
</tr>
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</table>
Regressions Statistics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adj R²</td>
<td>10.96%</td>
</tr>
<tr>
<td>F-stat</td>
<td>5.59</td>
</tr>
<tr>
<td>F-stat Prob</td>
<td>0.000</td>
</tr>
<tr>
<td>Obs (n)</td>
<td>672</td>
</tr>
</tbody>
</table>

T-statistics are given in parenthesis. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

As shown in Table A.2 above for the pooled OLS regression of ROA, ownership and board characteristics, the adjusted R² is 10.96%. The intercept coefficient is negative with a p-value of 0.00. The F-statistic is significant, with a p-value of 0.00. The number of firms with the necessary available data for the regression analysis is 672. The findings of this model and comparisons with the Tobin’s Q regression results are discussed in the paragraphs below.

Ownership and Ownership Structure

Institutional Ownership and Insider Ownership

As previously found and discussed, institutional ownership and insider ownership are positively correlated with ROA. These results are significant at the 5% level and the 1% level respectively. In comparison, institutional ownership is negatively correlated with Tobin’s Q and highly significant, while insider ownership is not showing any relationship with Tobin’s Q.

Voting Power of the Single Biggest Blockholder

The percentage ownership/voting rights of the single biggest blockholder is positively correlated with ROA, but only significant at the 10% level. This would indicate that on average, the greater the percentage ownership/voting power of the single biggest blockholder the greater the ROA for the Australian listed firms in this study. This is the same result for Tobin’s Q and the variable representing the percentage ownership/voting rights of the single biggest blockholder.

Board Structure and Composition

Non-executive Directors

The percentage of non-executive directors on an Australian corporate board is positively correlated with ROA and significant at the 10% level, indicating that on average, a relatively higher percentage of non-executive directors on the board of the firms in this
study, improves ROA for these firms. In contrast, the variable representing the total percentage of non-executive directors on a corporate board is negatively correlated with Tobin’s $Q$, although not highly significant at the 10% level.

**Control Variables**

**Growth and Size**

As found in the previous regression analysis, growth and size are once again positively correlated with ROA and both highly significant at the 1% level.

**Leverage**

Leverage is again negatively correlated with ROA at the 1% level.

4. Pooled Two-Stage Least Squares (2SLS) Regression for Performance (ROA), Ownership and Board Characteristics

**ROA, Ownership and Board Characteristics**

The pooled 2SLS regression analysis described below for ROA, ownership structure and board characteristics is conducted as a robustness test and for comparison of results with performance as measured by Tobin’s $Q$, ownership structure, and board characteristics. Table A.3 below provides results for the pooled 2SLS regression analysis of ROA, Ownership and Board characteristics for the period 2011-2006. The dependent variable is PFRM (ROA). The regression equation is depicted as:

**Equation 6**

$$
PFRM = \alpha + \beta_1GRW + \beta_2SZE + \beta_3LEV + \beta_4IND + \beta_5O_INST + \beta_6O_INSDR + \beta_7VP_BH + \beta_8B_NEDS + \beta_9B_GD + \beta_{10}B_AFF + \beta_{11}B_SZE + \beta_{12}CGSCR + \beta_{13}YRD2010 + \beta_{14}YRD2009 + \beta_{15}YRD2008 + \beta_{16}YRD2007 + \beta_{17}YRD2006 + \varepsilon
$$

Where $\alpha$ represents the intercept, $\beta$ the regression coefficients and $\varepsilon$ is the error term. PFRM represents performance (ROA) which is the dependent variable. The independent variables are represented by four control variables, GRW, SZE and LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O_INST representing total percentage of institutional holdings, O_INSDR which represents total percentage of shares held by insiders and VP_BH which represents the percentage voting power of the single biggest blockholder, plus B_NEDS which is the total percentage of
non-executive board members, B_GD is the percentage of women on the board, B_AFF represents the average number of other corporate affiliations of board members, B_SZE represents the size of the board, and CGSCR which is a corporate governance score. There are five year dummy dichotomous variables, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006.

The list of instrumental variables is comprised of: GRW, SZE, LEV, IND, O_XHLD, O_INST, O_INSDDR, B_NEDS, B_GD, B_AFF, B_SZE and CGSCR, plus five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. All variables are fully described in the description of the variables, Chapter 3, Table 3.2.

Table A.3 Pooled 2SLS Results for ROA, Ownership and Board Characteristics

<table>
<thead>
<tr>
<th>Dependent Variable – PFRM (ROA)</th>
<th>Intercept</th>
<th>GRW</th>
<th>SZE</th>
<th>LEV</th>
<th>IND</th>
<th>Corporate Governance Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0.24415</td>
<td>0.14386</td>
<td>0.01803</td>
<td>-0.15849</td>
<td>-0.00739</td>
<td>O_INST</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>**</td>
<td>(2.856)</td>
</tr>
<tr>
<td></td>
<td>(-3.922)</td>
<td>(5.826)</td>
<td>(3.372)</td>
<td>(-4.313)</td>
<td>(-2.129)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>O_INSDDR</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VP_BH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B_NEDS</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>B_GD</td>
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<td></td>
<td></td>
<td>B_AFF</td>
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<td>B_SZE</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>CGSCR</td>
</tr>
<tr>
<td>Year Variables</td>
<td>( \hat{Y} )</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>---------------</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YRD2010</td>
<td>-0.00594 (-0.414)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>YRD2009</td>
<td>-0.01435 (-0.894)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>YRD2008</td>
<td>-0.01003 (-0.465)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YRD2007</td>
<td>0.03494 (1.494)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YRD2006</td>
<td>0.00677 (0.246)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Regression Statistics**

- \( \text{ADJ } R^2 \): 11.10%
- \( F \)-statistic: 5.77
- Prob (\( F \)-statistic): 0.000
- \( J \)-statistic: 0.000
- Observations: 672

T-statistics are given in parenthesis. * * * indicate statistical significance at the 10%, 5% and 1% levels respectively.

The results of the pooled 2SLS regression analysis for ROA, ownership and board characteristics depicted in Table A.3 above, shows an adjusted \( R^2 \) of 11.10%. The intercept coefficient is negative with a \( p \)-value of 0.00. The \( F \)-statistic is significant, with a \( p \)-value of 0.00, and the \( J \)-statistic is zero. The number firms with all of the available data necessary for this analysis are 672.

All of the results from the 2SLS regression analysis are similar to the previous pooled OLS estimate except that the variable representing the percentage ownership/voting power of the single biggest blockholder. This variable is not showing to be significant in this regression analysis.

### 5. Pooled OLS Regressions for Performance (ROE) and Ownership Structure

**ROE and Ownership Structure**

The pooled regression analysis described below for ROE and ownership structure is conducted as a robustness test and for comparison of results with performance as measured by Tobin’s \( Q \), and ownership structure. Table A.4 below provides results for the pooled OLS regression analysis of ROE and Ownership Structure for the period 2011-2006. The dependent variable is PFRM (ROE). The regression equation is depicted as:
Equation 2

\[ PFRM = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O\_XHLD} + \beta_6 \text{O\_INST} + \beta_7 \text{O\_INSDR} + \beta_8 \text{YRD2010} + \beta_9 \text{YRD2009} + \beta_{10} \text{YRD2008} + \beta_{11} \text{YRD2007} + \beta_{12} \text{YRD2006} + \epsilon \]

Where: \( \alpha \) represents the intercept, \( \beta \) the regression coefficients and \( \epsilon \) is the error term. PFRM represents performance (ROE) and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O\_XHLD representing total percentage of cross held shares, O\_INST representing total percentage of institutional holdings, and O\_INSDR which represents total percentage of shares held by insiders. There are five dichotomous variables in the form of five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. All variables are described in the description of the variables, Chapter 3, Table 3.2.

Table A.4 Pooled OLS Results for ROE and Ownership Structure

<table>
<thead>
<tr>
<th>Dependent Variable –ROE</th>
<th>Pooled –2006-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-105.01620 ***</td>
</tr>
<tr>
<td></td>
<td>(12.944)</td>
</tr>
<tr>
<td>GRW</td>
<td>29.35595 ***</td>
</tr>
<tr>
<td></td>
<td>(6.840)</td>
</tr>
<tr>
<td>SZE</td>
<td>8.16892 ***</td>
</tr>
<tr>
<td></td>
<td>(13.298)</td>
</tr>
<tr>
<td>LEV</td>
<td>-18.61797 **</td>
</tr>
<tr>
<td></td>
<td>-(2.477)</td>
</tr>
<tr>
<td>IND</td>
<td>-1.75989 **</td>
</tr>
<tr>
<td></td>
<td>-(2.438)</td>
</tr>
<tr>
<td>Corporate Governance Variables</td>
<td></td>
</tr>
<tr>
<td>O_XHLD</td>
<td>0.08454</td>
</tr>
<tr>
<td></td>
<td>(1.118)</td>
</tr>
<tr>
<td>O_INST</td>
<td>0.13518</td>
</tr>
<tr>
<td></td>
<td>(1.316)</td>
</tr>
<tr>
<td>O_INSDR</td>
<td>0.39488 ***</td>
</tr>
<tr>
<td></td>
<td>(3.709)</td>
</tr>
</tbody>
</table>
As shown in Table A.4 above, for the pooled OLS regression of ROE and ownership, the adjusted $R^2$ is 17.01%. The intercept coefficient is negative with a $p$-value of 0.00. The $F$-statistic is significant, with a $p$-value of 0.00. The number of firms with the necessary available data for the regression analysis is 1389. The findings of this model and comparisons with the Tobin’s $Q$ regression results are discussed in the paragraphs below.

**Ownership Structure**

**Insider Ownership**

The results also show that insider ownership is positively correlated with ROE and highly significant at the 1% level, indicating that on average for the firms in this study, the greater the percentage of shares held by insiders, the better the ROE for the firm.

**Control Variables**

**Growth and Size**

Of the control variables, growth and size are positively correlated with ROE for the Australian listed firms in this study. Both results are highly significant at the 1% level. Therefore on average, the higher the current growth measure, the greater the ROE for the firm. The results also indicate that, on average, the relatively larger the size of the firm, the higher the ROE for the firm.
Leverage

Leverage is negatively correlated with ROE and significant at the 5% level. This result indicates that on average, the higher the degree of leverage, the lower the ROE for the average firm.

Dichotomous Year Dummies

This analysis also shows a negative correlation between ROE and the year dummy for 2009. The result is significant at the 1% level.

6. Pooled OLS Regressions for Performance (ROE), Ownership and Board Characteristics

ROE, Ownership and Board Characteristics

The pooled regression analysis described below for ROE, ownership structure and board characteristics, is conducted as a robustness test and for comparison of results with performance as measured by Tobin’s $Q$, ownership structure, and board characteristics. Table A.5 below provides results for the pooled OLS regression analysis of ROE, Ownership and Board characteristics for the period 2011-2006. The dependent variable is PFRM (ROE). The regression equation is depicted as:

\[ PFRM = \alpha + \beta_1 \text{GRW} + \beta_2 \text{SZE} + \beta_3 \text{LEV} + \beta_4 \text{IND} + \beta_5 \text{O_XHLD} + \beta_6 \text{O_INST} + \beta_7 \text{O_INSDR} + \beta_8 \text{VP_BH} + \beta_9 \text{B_NEDS} + \beta_{10} \text{B_GD} + \beta_{11} \text{B_AFF} + \beta_{12} \text{B_SZE} + \beta_{13} \text{CGSCR} + \beta_{14} \text{YRD2010} + \beta_{15} \text{YRD2009} + \beta_{16} \text{YRD2008} + \beta_{17} \text{YRD2007} + \beta_{18} \text{YRD2006} + \epsilon \]

Where: $\alpha$ represents the intercept, $\beta$ the regression coefficients; and $\epsilon$ is the error term. PFRM represents performance, (ROE) and is the dependent variable. The independent variables are represented by four control variables, GRW, SZE, LEV and IND, controlling for growth, size, leverage, and industry. The other independent variables are $\text{O_XHLD}$ representing total percentage of cross held shares, $\text{O_INST}$ representing total percentage of institutional holdings and $\text{O_INSDR}$ which represents total percentage of shares held by insiders, and $\text{VP_BH}$ which represents the percentage ownership/voting power of the single biggest blockholder, plus $\text{B_NEDS}$ which is the total percentage of non-executive board members, $\text{B_GD}$ is the percentage of women on the board, $\text{B_AFF}$ represents the average number of other corporate affiliations of board members, $\text{B_SZE}$ represents the size of the
board, and CGSCR which is a corporate governance score. There are five year dummy dichotomous variables, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. All of the variables are fully described in the description of the variables, Chapter 3, Table 3.2.

Table A.5 Pooled OLS Results for ROE, Ownership and Board Characteristics

<table>
<thead>
<tr>
<th>Dependent Variable – ROE</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-38.24269***</td>
<td>-3.258</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRW</td>
<td>23.68807***</td>
<td>5.107</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SZE</td>
<td>2.80623***</td>
<td>2.754</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEV</td>
<td>-0.89845</td>
<td>0.120</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IND</td>
<td>-1.89783***</td>
<td>2.923</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Corporate Governance Variables</td>
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<td></td>
</tr>
<tr>
<td>O_XHLD</td>
<td>0.07853</td>
<td>0.851</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O_INST</td>
<td>0.14327</td>
<td>1.324</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O_INSDR</td>
<td>0.38962***</td>
<td>3.195</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP_BH</td>
<td>-0.03496</td>
<td>0.301</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B_NEDS</td>
<td>0.12250</td>
<td>1.329</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B_GD</td>
<td>0.31258***</td>
<td>2.712</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B_AFF</td>
<td>-1.54995</td>
<td>1.205</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B_SZE</td>
<td>0.14975</td>
<td>0.230</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CGSCR</td>
<td>-0.06687</td>
<td>1.227</td>
</tr>
</tbody>
</table>
As shown in Table A.5 above, for the pooled OLS regression of ROE, ownership and board characteristics, the adjusted $R^2$ is 12.83%. The intercept coefficient is negative with a $p$-value of 0.00. The F-statistic is significant, with a $p$-value of 0.00. The number of firms with the necessary available data for the regression analysis is 668. The findings of this model and comparisons with the Tobin’s $Q$ regression results are discussed in the paragraphs below.

**Ownership and Ownership Structure**

**Insider Ownership**

As previously found and discussed, insider ownership is positively correlated with ROE and significant at the 1% level. In comparison, institutional ownership is negatively correlated with Tobin’s $Q$ and highly significant also.

**Voting Power of the Single Biggest Blockholder**

The percentage ownership/voting power of the single biggest blockholder is found to be positively correlated with ROE, but not highly significant at the 10% level. This would indicate that on average, the higher the percentage ownership/voting power of the single biggest blockholder, the higher the ROE for the Australian listed firms in this study.
Board Characteristics

Percentage of Women on the Board

The percentage of women on an Australian corporate board is positively correlated with ROE and significant at the 1% level, indicating that on average, for the firms in this study, a higher the percentage of women on the board, the higher the ROE for those firms.

Control Variables

Growth and Size

As found in the previous regression analysis, growth and size are once again positively correlated with ROE and both results highly significant at the 1% level.

Dichotomous Year Dummies

Finally, the year dummy for 2007 is positively correlated with ROE.

7. Pooled Two-Stage Least Squares (2SLS) Regression for Performance (ROE), Ownership and Board Characteristics

ROE, Ownership and Board Characteristics

The pooled regression analysis described below for ROE, ownership structure and board characteristics, is conducted as a robustness test and for comparison of results with performance as measured by Tobin’s $Q$, ownership structure, and board characteristics. Table A.5 below provides results for the pooled 2SLS regression analysis of ROE, Ownership and Board characteristics for the period 2011-2006. The dependent variable is PFRM (ROE). The regression equation is depicted as:

Equation 6

\[
PFRM = \alpha + \beta_1 GRW + \beta_2 SZE + \beta_3 LEV + \beta_4 IND + \beta_5 O\_INST + \beta_6 O\_INSDR + \beta_7 VP\_BH + \beta_8 B\_NEDS + \beta_9 B\_GD + \beta_{10} B\_AFF + \beta_{11} B\_SZE + \beta_{12} CGSCR + \beta_{13} YRD2010 + \beta_{14} YRD2009 + \beta_{15} YRD2008 + \beta_{16} YRD2007 + \beta_{17} YRD2006 + \varepsilon
\]

Where $\alpha$ represents the intercept, $\beta$ the regression coefficients and $\varepsilon$ is the error term. PFRM represents performance (ROE) which is the dependent variable. The independent variables
are represented by four control variables, GRW, SZE and LEV and IND, controlling for growth, size, leverage and industry. The other independent variables are O_INST representing total percentage of institutional holdings, O_INSHDR which represents total percentage of shares held by insiders and VP_BH which represents the percentage voting power of the single biggest blockholder, plus, B_NEDS which is the total percentage of non-executive board members, B_GD is the percentage of women on the board, B_AFF represents the average number of other corporate affiliations of board members, B_SZE represents the size of the board, and CGSCR which is a corporate governance score. There are five year dummy dichotomous variables, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006.

*The list of instrumental variables is comprised of:* GRW, SZE, LEV, IND, O_XHLD, O_INST, O_INSHDR, B_NEDS, B_GD, B_AFF, B_SZE and CGSCR, plus five year dummies, YRD2010, YRD2009, YRD2008, YRD2007 and YRD2006. All of the variables are described in the description of the variables, Table 3.2.

Table A.6 Pooled 2SLS Results for ROE, Ownership and Board Characteristics

<table>
<thead>
<tr>
<th>Dependent Variable – PFRM (ROE)</th>
<th>Intercept</th>
<th>GRW</th>
<th>SZE</th>
<th>LEV</th>
<th>IND</th>
<th>Corporate Governance Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pooled – 2006-2011</td>
<td>-38.17958</td>
<td><strong>23.84439</strong></td>
<td><strong>2.68310</strong></td>
<td>-1.44862</td>
<td>-1.98716</td>
<td>O_INST 0.12303 (1.176)</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>(-0.192)</td>
<td>***</td>
<td>O_INSHDR 0.32443 (2.570)</td>
</tr>
<tr>
<td></td>
<td>(-3.250)</td>
<td>5.130</td>
<td>(2.652)</td>
<td></td>
<td>-3.04251</td>
<td>VP_BH 0.15182 (0.814)</td>
</tr>
</tbody>
</table>
The results of the 2SLS regression analysis for ROE, ownership and board characteristics depicted in Table A.6 above, shows an adjusted $R^2$ of 12.62%. The intercept coefficient is negative with a $p$-value of 0.00. The F-statistic is significant, with a $p$-value of 0.00, and the J-statistic is zero. The number firms with all of the available data necessary for this analysis are 668. All of the results from the 2SLS regression analysis are similar to the previous pooled OLS regression, except that the year dummy 2006 is now also showing a positive correlation with ROE along with the year dummy for 2007.
Appendix 2 – Methods for Estimating Idiosyncratic Volatility

There are two main methods for estimating idiosyncratic volatility. These are the direct method and the indirect method as described below.

The Direct Method

Idiosyncratic volatility is defined as the variance of stock returns not explained by the CAPM (Lintner, 1965; Sharpe, 1964), or alternatively not explained by the size and book-to-market equity factors of the Fama and French (1993) three-factor model. Therefore, idiosyncratic volatility for an individual stock can be calculated as the variance (or standard deviation) of the residuals from estimating each security’s CAPM regression model (see for example, Malkiel and Xu, 1997; Malkiel and Xu, 2004). Alternatively, the variance (or standard deviation) of the residuals from estimating the Fama and French (1993) three-factor regression model can also be used. Determining idiosyncratic volatility from the residuals of these models is known as the direct method (see for example, Bali et al. 2005; Guo and Savickas, 2006; Malkiel and Xu, 2004).

The Capital Asset Pricing Model

The CAPM is a model of expected returns. Estimates of the CAPM beta are based on a regression model known as the market model. In the market model, a security’s return is broken down into a systematic and an unsystematic component. The systematic component is related to the behaviour of the return on the market, while the unsystematic component is due to the error term. The variance of the regression residuals from the market model is one estimate of idiosyncratic risk. The market model can be written as:

\[ R_{it} = a_i + \beta_i (R_{mt} - R_{ft}) + \epsilon_{it} \]

Where:

- \( R_{it} \) = is the expected return on a particular stock (stock i) at time t
- \( R_{ft} \) = is the risk-free rate of interest at time t
- \( ai \) = the regression coefficient, the intercept
- \( \beta_i \) = is the beta coefficient of stock i
- \( R_{mt} \) = is the average return on the market portfolio of risky assets at time t
- \( \epsilon_{it} \) = the error term at time t

The Three-factor Model

According to the three-factor model, a security’s return is broken down into a systematic part and an unsystematic component. The systematic part is that part that is
related to the behaviour of the return on the market and the return of two hedging portfolios. One portfolio is based on book-to-market equity and the other is based on firm size. The unsystematic component is due to the error term. The model shown below is the regression model used to estimate the three-factor model, and the variance of this regression’s residuals is another estimate of idiosyncratic risk.

\[
R_{it} = a_i + b_i(R_{mt} - R_{ft}) + s_iSMB_t + h_iHML_t + \varepsilon_{it}
\]

Where:

- \(R_{it}\) = the expected return on a particular stock (stock \(i\)) at time \(t\)
- \(R_{ft}\) = the risk-free rate of interest at time \(t\)
- \(ai\) = the regression coefficient, the intercept
- \(R_{mt}\) = the return on the market portfolio of risky assets at time \(t\)
- \(SMB_t\) = the difference each month, between the average of the returns of the three small stock portfolios (S/L, S/M, and S/H) and the average of the returns of the three big stock portfolios (B/L, B/M, and B/H) at time \(t\)
- \(HML_t\) = the difference each month, between the average of the returns on the two high BE/ME (S/H and B/H) portfolios and the average of the returns of the two low BE/ME (S/L and B/L) portfolios at time \(t\)
- \(\varepsilon_{it}\) = is the error term at time \(t\)
- \(bi, si\) and \(hi\) are the factor sensitivities which are the slopes of the regression

Therefore using the direct method idiosyncratic volatility can be calculated as the variance (or standard deviation) of the residuals for stock \(i\) using either the CAPM or the three-factor model discussed above.

**The Indirect Method**

This approach uses the market model where idiosyncratic return is determined as the difference between the stock return and market return (see, Drew et al. 2004; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997). Although there are variations to this approach, the fundamental process is the same, whereby, the idiosyncratic risk component for a stock is estimated as the difference between the total risk of the stock, and the systematic risk component of the stock (see, Drew et al. 2004; Goyal and Santa-Clara, 2003; Malkiel and Xu, 1997).

The measure of idiosyncratic volatility is computed as the total risk of a stock (i.e. variance of returns for that stock), minus the systematic risk component for that stock. The systematic risk component of the stock is calculated as the variance of the market index multiplied by the stock’s beta. For this approach to be used, the variance of the stock needs
to be determined along with the variance of the market index (see, Drew et al. 2004). The process for determining idiosyncratic volatility for a stock, using this method, is as follows:

- Firstly, compute the variance of returns for each individual stock in the sample
  The variance of returns for each stock is taken as the total risk of that particular stock;
- Secondly, beta is estimated for each individual stock using the covariance/variance method, where the covariance of a stock’s return and the market return (the market index), is divided by the variance of the market (market index);
- Systematic risk for a stock is then taken as the beta of that stock multiplied by the variance of the market index;
- Finally, idiosyncratic volatility for an individual stock will be defined as the total risk of the stock minus the systematic risk of that stock.

The estimation of idiosyncratic volatility for stock \( i \) using the indirect method can be shown as:

\[
V_{ido} = V_{tot} - V_{sys} = \sigma^2_i - (\beta_i \cdot \sigma^2_m)
\]

Where:

- \( V_{ido} \) = the measure of idiosyncratic volatility for a particular stock (stock \( i \)).
- \( V_{tot} \) = the total volatility of a stock, which is the variance of returns for a particular stock (stock \( i \)), also shown here as \( \sigma^2_1 \).
- \( V_{sys} \) = the systematic risk component of a particular stock (stock \( i \)), which is the variance of the market index, multiplied by the beta of a particular stock (stock \( i \)), also shown here as \( \beta_i \cdot \sigma^2_m \).

Therefore using the indirect method, idiosyncratic volatility can be determined as the total variance of returns for stock \( i \), minus, the beta of stock \( i \) multiplied by the variance of the market index, as shown in the equation above.
Appendix 3 – DataStream Corporate Governance Score

The DataStream corporate governance score used in the current study is an overall corporate governance score for a company, which is made up of all corporate-governance related indicators and scores within the DataStream data. It is described as a pillar that measures a company's governance systems and processes that aim to make sure that managers, executives and directors act in the best interests of the company and its long-term shareholders. Moreover, the score is as a reflection of the capacity and capability of that company to make sure that the company’s rights and responsibilities are directed and controlled through the use of best management practices, checks and balances, and incentives, with the ultimate goal of generating value for the company and its’ long-term shareholders. Further, the corporate governance score is determined on a transparency score, combined with elements related to various categories such as board structure, board functions, compensation policy, shareholder rights, and vision and strategy (DataStream 2012).

The board structure category includes, board structure policy, average of years of experience of the board members, percentage of non-executive directors, and percentage of independent board members. It also includes aspects such as whether the roles of CEO and chairman are separated, background and skills of the directors, the number of directors on the board, and percentage of women on the board. The Board function category includes the percentage of independent directors on the audit committee, percentage audit committee management independence, audit committee expertise, percentage of independent directors on the compensation committee, percentage compensation committee management independence, and the percentage of independent directors on the nomination committee. This category also includes percentage nomination committee management independence, number of board meetings, and average percentage attendance at board meetings (DataStream 2012).

The compensation category includes whether the company has a compensation policy in place or not, highest remuneration package, total board member compensation, and whether the company has a stock option program or not. This category also includes senior executive long-term compensation incentives, and vesting of stock options/restricted stock. The shareholder rights category is made up of a number of yes/no questions as to the company’s capacity and provision for shareholder rights/policy, voting rights, ownership, classified board structure, staggered board structure. The final category contributing to the determination of the corporate governance score is the vision and strategy category. This includes integrated vision and strategy challenges and
opportunities, CSR sustainability committee, GRI report guidelines, CSR sustainability report global activities, CSR sustainability external audit (DataStream 2012).

In addition, all of the scores in the DataStream data are reported to be objective, and not subjectively decided upon. They are calculated using a simple mathematical formula, and by comparing the companies in a benchmark. A score is an aggregate of all indicators in a respective group, equally weighted and normalized. Score values are between 0% and 100%, where a score of 100% is best and 0% is worst (DataStream 2012).