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The determinants of equity agency conflicts between managers and shareholders: Evidence from Australia

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Abstract

We analyse the determinants of equity agency costs for the top 500 Australian listed firms. Data are collected over four one-year periods (2004, 2005, 2010 and 2011) and analysed using both pooled OLS regression and two stage least squares regression within a random effects panel data model. Analysis covers the full four-year period, the pre global financial crisis (GFC) sub-period (2004 and 2005) and the post GFC sub-period (2010 and 2011). Shareholding, board characteristics and debt financing are found to have an impact on agency costs though there is evidence of some change in these relations with the onset of the GFC, particularly with respect to the impact of insider ownership and board size.

JEL Classifications: F02; G32; G34.

Keywords: equity agency conflicts; ownership; board of directors; debt financing.

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1. Introduction

There has been some analysis of the determinants of agency costs reported in the US and the UK literature (Ang et al. 1999; Singh and Davidson 2003 for US firms; McKnight and Weir 2009; Florackis and Ozkan 2005 for UK firms). Australian studies in this area include a study of small to medium Australian firms (Fleming et al. 2005 and recent work by Henry 2010) focusing on a little over 100 large Australian firms. We concentrate on the largest 500 companies listed on the Australian stock exchange and report results from pooled ordinary least squares regression (OLS) with standard errors adjusted for clustering and two stage least squares regression (2SLS) within in a random effects panel data model. The 2SLS analysis is undertaken to account for the possibility that insider ownership and agency costs are endogenous. While Henry (2010) deals with the period prior to the implementation of the best ASX governance code of practices, 1992 to 2002, our data starts from 2004 following the implementation of the code. We choose four panels for analysis, one panel for each of four years (2004, 2005 prior to the GFC and 2010 and 2011 following the GFC).¹

Equity agency conflicts arise when the interests of managers and shareholders diverge, and this should be manifested in the level of efficiency with which managers use firm assets and manage discretionary operating expenses. Poorly committed or motivated managers tend to use assets less efficiently and incur higher levels of discretionary operating expenses. Thus, an asset utilisation ratio and a discretionary operating expense ratio are likely to capture the extent of equity agency conflicts that may exist between managers and shareholders, reflecting perquisite consumption and negative net present value investment. While there are number of possible proxies for agency expenses we focus on asset utilisation AUR and discretionary operating expense ratios DER, which vary considerably across our sample of

¹ We would like to thank the reviewer for suggesting extension of the data set to include the period following the GFC.

firms and are commonly used in the literature. Both focus on the costs associated with agency conflicts.

There are number of contributions made in this paper. We identify a statistically significant positive inside ownership effects for asset utilisation. This applies both to pooled OLS and to 2SLS based analysis (with the exception of the post GFC period). This result is consistent with the work of Henry (2010), Ang, Cole and Lin (1999) and Singh and Davidson (2003). We also find evidence to support the existence of a link between inside ownership and discretionary expenses, particularly in the post GFC period. This is important as the link between insider ownership and equity agency costs is a critical insight from finance theory.

Importantly, our study follows the implementation of the “Governance code of best practices” by Australian Stock Exchange (ASX) Corporate Governance Council in early 2003 and covers a wider cross-section of Australian companies than is evident in the Australian literature to date. The data set also spans the Important GFC period. We expand upon the work of Singh and Davidson (2003) with a focus on the influence of selected board characteristics though we do not include a broad governance index along the lines of Henry (2010) given the fairly sticky nature of governance indices over time and the problems noted in the governance literature with the use of governance indices (Bhagat and Bolton, 2008). While we find little evidence to support a CEO-chair duality effect, consistent with McKnight et al (2009), we do find that board size is positively correlated with agency costs. There is evidence of negative correlation with asset utilisation and positive correlation with discretionary expenses. There is one exception to this board size result in the post_GFC period though this is not statistically significant. This finding is consistent with the “board cohesiveness” argument of Jensen (1993) and Yermack (1996).

We also recognise the importance of debt financing in controlling equity agency conflicts with a focus on the firm’s short-term debt as well as its total debt (Florackis and

Ozkan 2005). While Henry (2010) finds no evidence of leverage effects, we observe that both total debt and the relative level of short term debt have a part to play in explaining variation in agency costs across Australian firms.

This paper is structured as follows. Section 2 reviews existing studies to establish a theoretical links between agency costs and governance attributes. Section 3 then describes the sample and data that we employ in our analysis. Section 4 briefly explains our methodological approach and then discusses both analysis and robustness results. We conclude with few remarks in Section 5.

2. Governance mechanisms and equity agency costs

Conflicts of interest that arise between the agent (managers) and the principal (shareholders) have long been central to the study of modern corporations (Berle and Means 1932). Existing literature has tended to describe situations in which conflicts of interest are likely to arise, analysing potential agency costs that the firm incurs, and identifying governance mechanisms that could reduce the likelihood of significant agency costs. This section reviews previous studies in order to develop a theoretical framework for latter analysis.

We focus on board size and separation of the CEO and chair in this study as proxies for governance. There is a wide range of variables and indices that could be included in our study to proxy for governance, though we have chosen these two variables consistent with the literature (Bhagat and Bolton 2008; Henry 2010; McKnight et al 2009). While CEO tenure would be useful this information is not available for all of the firms in our study. Similarly, it would be useful to control for board of directors compensation though this data is not easily accessible. The results from Henry (2010) suggest that committee structure has little

explanatory power over agency costs and so we do not further explore the impact of committee structure in our analysis.

It is expected that board size and leadership will have a role in controlling agency conflicts (Bhagat and Black 1999). Individual directors contribute different sets of skills and expertise to the board, and thus as board size increases, the board's greater monitoring ability could reduce agency conflicts between managers and shareholders. Yet, this benefit may be outweighed by reduced effort and cooperation as board size increases. For example, ineffective communication and poor decision-making may result as board size increases beyond the optimal level for the firm (John and Senbet 1998). Lipton and Lorsch (1992) argue smaller boards work more effectively. Jensen (1993) suggests board size should not exceed 10 directors and Yermack (1996) produces evidence that firms with a smaller board are associated with better market returns. It is important to note that the board size choice is complex. Indeed, it is expected that there will be an optimal board size for each firm rather than an optimal board size for all firms (Harris and Raviv 2008; Hermalin and Weisbach 2003).

The separation of the position of chair and CEO is thought to strengthen the monitoring ability of the board as an independent chair may lead to greater independence from the firm's management (Shivdasani and Yermack 1998; Arthur 2001). Yet, in his theoretical model, Hermalin (2005) argues that entrenched CEOs tend to control the composition of the board and hence to lessen the monitoring ability of the board. Further, Coles, Brickley and Jarrell (1997) document potential costs as well as benefits relating to the separation of the role of the CEO and chair. They suggest that firms with separate CEO and chair could generate lower returns than those without this separation.

It is a common view that managers generally maximise their own well-being (personal wealth, job security, and prestige) while shareholders are interested in maximising the value

of the firm (Shleifer and Vishny 1997). Increasing the proportion of equity owned by firm management could help alleviate conflicts of interest that exist between managers and shareholders (Jensen and Meckling 1976). At low levels of managerial equity ownership, there is personal incentive for the managers to engage in investment projects and to adopt financing policies that benefit themselves at the expense of shareholders. However, as managerial ownership increases, the interests of managers and shareholders may become more aligned, though there is the potential for managers to become entrenched as their shareholding increases.

Empirical research suggests managerial ownership can influence firm value. The influence of managerial ownership on firm value may be non-linear though the likely relation is uncertain (McConnell and Servaes 1990; McConnell and Servaes 1995; Morck, Shleifer and Vishny 1988). We focus on testing for a simple linear relation as there is not much evidence to support a quadratic relation in recent work (Henry 2010, McKnight et al 2009).

Shareholders with substantial holdings (blockholders) could play an important role in monitoring firm management, and hence affect the level of agency costs (Shleifer and Vishny 1986). For example, blockholders may have better access to information on managerial performance and more resources to remove managers who do not maximise shareholder wealth (Mak and Li 2001). However, as Shleifer and Vishny (1986) note, the presence of blockholders has costs as well as benefits because firms with high block ownership may face another type of agency conflict. This arises between large shareholders and minority shareholders with large shareholders attempting to expropriate wealth from minority shareholders especially in the environment where legal protection for minority shareholders is weak.² Thus, it is difficult to predict how block ownership might affect agency costs.

² Nevertheless, empirical studies tend to support the findings of Demsetz and Lehn (1985), that there is a little correlation between firm value and ownership by large shareholders (Harper 2002; Thomsen, Pedersen et al. 2006).

Debtholders can provide alternative, or complementary, management monitoring (Agrawal and Knoeber 1996). There is incentive for debtholders to monitor firm management to minimise the cost of financial distress. It is also possible that leverage reduces free cash flows as it forces the managers to pay out free cash flows in the form of interest and principal payments. Based on both arguments, Stulz (1990) suggests that debt financing has a dual effect on the value of firm, and that the choice debt financing may result in increased monitoring of management. Fleming et al. (2005) also discuss the benefits of debt financing in mitigating equity agency conflicts though they find no empirical support for this argument. McConnell and Servaes (1995) suggest that the impact of debt financing on agency conflicts vary with firm growth options as they find that the level of debt financing is negatively (positively) related to firm value for high (low) growth firms. Thus, debt could have an impact on the agency costs through increased monitoring though empirical support is mixed (Henry 2010; McKnight 2009).

3. Data

This study focuses on the 500 largest Australian firms, based on market capitalisation, listed on the Australian Stock Exchange (ASX) as at December 2004, in two years 2004 & 2005 and as at 2010 in the two years 2010 and 2011. This sample covers all industries including financials and utilities, often excluded in previous studies. Table 1 provides a summary of the average market capitalisation across the four years, the number of firm years and percentage of the sample for each of the 10 GICS sector classifications. Our sample accounts for over 90% of the (ASX) total market capitalisation.

[INSERT TABLE 1 ABOUT HERE]

For the analysis, our accounting data were collected primarily from DataStream, Connect4, Aspect Huntley's FinAnalysis and DatAnalysis. Ownership structure and board characteristic variables were hand collected from 2004, 2005, 2010 and 2011 annual reports if these data are not available in electronic form.³ For missing observations, data was hand collected from alternative data sources where possible including company web sites. We applied a series of checks and filters to the data before conducting formal analysis and extreme values were identified and then crosschecked with alternative sources, particularly annual reports and company websites and errors were corrected where necessary. We will briefly describe all variables of interest that we employ in our analysis in the following section.

Table 2 provides definitions of selected variables used in this study including our two proxies for agency costs. Following Singh and Davidson (2003), we rely on measures of asset utilisation and discretionary expenses. Our first proxy is the ratio of annual sales to total assets AUR, seen as a measure of asset utilisation that captures how efficiently the firm's assets are used. A low asset utilisation ratio is associated with inefficient use of firm assets, which could be attributable either to a lack of commitment or effort in the use of the assets or to insufficient monitoring. Hence, AUR is inversely be related to the level of equity agency conflicts that exist between managers and shareholders.

[INSERT TABLE 2 ABOUT HERE]

The second agency cost proxy is the ratio of discretionary operating expenses to total sales, DER. The variable, DER, excludes the cost of goods sold, interest expenses, leasing

³ For both years, 2010 and 2011, ownership and board data were collected from SIRCA database. We then hand collected missing data from other sources such as DatAnalysis, company website.

and hiring expenses, depreciation, and bad debt expenses. In some cases there is limited information to accurately identify which expenses or costs should be included or excluded from the estimate of DER. We have crosschecked information with several databases as well as accessing corporate websites to check that our estimate is correctly calculated.⁴ A relatively high DER ratio may indicate excessive expenditure on non-sales activities. This could be a signal that firm management is expropriating wealth from shareholders by diverting resources (via increased operating expenses) to personal perquisite consumption or investing in negative NPV projects (Shleifer and Vishny 1986). This is an important source of agency conflicts between managers and shareholders, and hence, DER is expected to be positively linked to equity agency costs. We exclude extreme agency cost proxy values of AUR and DER to reduce potential outlier effects before undertaking formal analysis.⁵

There is a range of alternate proxies that could be used for agency costs though measures of the efficiency of asset use and discretionary expenses have proven useful in the literature and we focus on these two measures in this paper. Market price based alternative measures are evident in the literature (Henry 2010). Examples of these proxies include excess returns and the ratio of market to book value of total assets. The problem with these measures is that they reflect both the costs and benefits that arise from the use of agents and thus give little insight into the true magnitude of the cost of agency conflicts because the agency costs are netted off against the agency benefits in market based values. Another source of alternative proxies draws on free cash flows or operating cash flows. Free cash flows are extremely difficult to estimate accurately because of the need to capture all positive net present value projects available to the firm. Most cash flow based measures also suffer from

⁴ We acknowledge that we may not have identified all expenses falling within the discretionary operating expense classification but we have taken considerable care to include those that are available in the annual reports.

⁵ Upon evidence of significant non-normality with AUR and DER, we repeated our analysis using the log transformation of both proxies to reduce the level of non-normality. The results are similar and can be obtained upon request.

the same problem as the market values because both the costs and benefits of the agency relationship affect cash flows. Our chosen proxies for equity agency costs, AUR and DER, vary considerably across firms and are commonly used in the literature and both should reflect the impact of agency conflicts.

Two measures of ownership structure are included for analysis; inside ownership, INSOWN, and block ownership, BLOCK. Equity agency conflicts may change with the extent of block shareholding dispersion. Inside ownership potentially aligns the interests of owners and managers, and thus reduces agency conflicts. Hence, we predict that this proxy is positively (negatively) influence on AUR (DER). Further, the more dispersed the block shareholding, the greater the level of control that insiders may exercise over the firm, and so the greater the magnitude of equity agency costs. Hence, it is expected that outside block ownership is positively (negatively) linked to AUR (DER).

Prior theoretical work suggests that board size and board leadership structure (CEO-chair duality) could capture the monitoring ability of the board (Jensen, 1986). A dummy variable ICHAIR takes a value of 1 where the chair is an independent outside director, and 0 otherwise. This variable is indicative of the level of independence of the board. For firms with an independent chair, there should be lower agency conflicts (a high AUR and a low DER) than otherwise for an identical firm.

In addition, as board size BSIZE increases, there should be more resources available to monitor management, but this may also create “shirking” or “free-rider” problems among members of the board. Hence, BSIZE could have a dual influence (positive and negative) on agency costs, depending on which of these effects dominate. Recent empirical work suggests that agency costs are increasing in board size (Henry 2010).

Ang et al. (1999) focus on the monitoring role of banks in small business financing though this role is largely dependent on the banks’ incentives. Bank financing may be less

prevalent among publicly listed firms as they have wider access to other sources of financing. In our analysis, the total debt to total asset ratio TDEBT is used to capture the impact of bank monitoring (Singh and Davidson 2003). Yet, debt financing may also reduce free cashflow otherwise available for investment (Stulz 1990). Given this trade-off, agency costs could be either increasing or decreasing in debt financing TDEBT.

The structure of debt may also matter (Florackis and Ozkan 2005). Short-term debt may exert more pressure on management to perform due to more regular reviews that accompany short-term debt contracts and the impact of short-term debt on firm working capital. The firm's short-term debt to total debt ratio (SDEBT) , which is generally ignored in this literature, is included to examine the impact of firm debt structure on agency costs.

Agency conflicts vary across low and high growth firms as these firms have different levels of free cash flows and information asymmetry (McConnell and Servaes 1995). High growth firms tend to have less free cash flows and this reduces the potential for agency conflicts though high growth firms commonly face levels of high information asymmetry, resulting in a more complex management monitoring task for shareholders. Market to book ratio, FMKB, is used to proxy for the level of growth options in the firm. We also include a number of control variables including firm size and a set of year and industry dummy variables.

Descriptive statistics are report for the full sample of the largest 500 Australian listed firms for the years 2004, 2005, 2010 and 2011 in Table 3 with mean values reported for each of the years and mean, standard deviation, minimum and maximum reported for the pooled data. This is a considerable decrease (increase) in AUR (DER) between the pre-GFC years, 2004 and 2005 and the post-GFC years, 2010 and 2011. This reflects the extent of the impact of the GFC on firm assets and revenue. For example the average AUR fell from 0.81 to 0.66 from 2005 to 2010 and the DER increased from 0.22 to 0.39 over the same period.

[INSERT TABLE 3 ABOUT HERE]

Average block ownership tended to increase over the period of the study from an average of 41.14% of total outstanding shares held by large shareholders who own more than 5% in 2004 through to an average of 48.08% in 2011. Inside ownership tended to fall over the period of the study from a mean of 16.76% in 2004 to a mean of 10.45% in 2011. Over the period of the study this insider ownership percentage ranged from 0.00% to 98.26%.

The average board size for the sample is around 6.47 board members with some growth evident over the period, from 6.30 in 2004 to 6.57 in 2011. The proportion of firms with chair who were not the CEO increased dramatically over the sample period from 62.80% in 2004 to 93.80% in 2011.⁶ There is also a considerable decrease both in the proportion of short term debt to long term debt, SDEBT, and the level of debt itself, TDEBT. SDEBT decreased from 33.32% in 2004 to 25.86% in 2011 and TDEBT decreased from 19.75% in 2004 to 13.60% in 2011. There is some increase in firm size and market to book across the sample period. Three measures of average firm size, TSALE, TASSET and MCAP, are also reported at the bottom of Table 3 to provide some indication of the nature of our sample and the change in size of the average firm that has taken place over the study period.

Correlation coefficients were also calculated for the sample though the coefficients are generally less than 0.50 except for the correlation between board size and firm size and so we do not report these separately here. Given these results we do not expect multicollinearity to be a problem in latter multivariate analysis.

⁶ This is consistent with recent claims of corporate deleveraging.

4. Analysis

We report both pooled OLS regression with standard errors corrected for clustering at the firm level as well as 2SLS random effects panel data analysis to cater for the possibility of endogeneity with respect to insider ownership. It could be argued that insider ownership is affected by the level of agency conflicts that exist in the firm. For example, insiders may be less likely to invest in the firm if they can already extract perquisites from the firm without investing in it.⁷ To gain some indication of the impact of the GFC on our agency costs model, multivariate analysis includes both the full sample period (2004, 2005, 2010, 2011) and two sub-periods, the pre-GFC period (2004, 2005) and the post-GFC period (2010, 2011).

Based on previous studies, we model agency costs as a function of shareholding (insider ownership and blocking holding), board structure (board size and CEO-chair duality), debt financing (total debt and short term relative to total debt), growth options (market to book) and firm size. We also control for industry and time by including a set of GICs based industry dummies and a set of year dummies. The model takes the form:

$$ACOSTS_{it} = \begin{cases} \alpha_0 + \alpha_1 INSOWN_{it} + \alpha_2 BLOCK_{it} + \alpha_3 BSIZE_{it} + \alpha_4 ICHAIR_{it} + \alpha_5 SDEBT_{it} + \alpha_6 TDEBT_{it} \\ + \alpha_7 FSIZE_{it} + \alpha_8 FMKB_{it} + \sum_{j=1}^J \delta_j INDUSTRY_{ij} + \sum_{k=1}^K \gamma_k YEAR_{ik} + \varepsilon_{it} \end{cases} \quad (1)$$

ACOSTS refers to our agency cost proxies (AUR and DER). Table 2 provides a definition for each of variables included in our model.

4.1. Asset Utilisation (AUR)

The results from analysis of AUR appear in Table 4. Columns (2) through (4) cover the results from pooled OLS regressions and columns (5) to (7) are devoted to the 2SLS

⁷ We use the number of shareholders with more than 5% shareholding in the firm and board independence as instruments for insider ownership. Both variables are defined in Table 2.

results. The estimated models are statistically significant in all cases with R square values of ranging from 0.4 to 0.5. While Henry (2010) finds little support for a relation between insider shareholding and asset utilisation, consistent with McKnight et al (2009) we find some support for insider shareholder impacts. The variation is probably sample driven as our sample period begins well after the end of sample period from 1992 to 2002 selected by Henry and so is subject to recent changes in governance rulings and regulation affecting Australian corporation more recently. Apart for the 2SLS least squares analysis for the post-GFC period there is broad support for a statistically significant positive relation between insider ownership and asset utilisation. This result suggests that for our sample of large Australian companies, the greater the level of inside ownership the more efficient the use of the firm's assets.

The post-GFC result is particularly interesting because the pooled OLS results supports this result while the 2SLS squares result does not. The lack of a statistically significant relation in the post-GFC period is not surprising given the impact of the GFC on Australian firms though it is important to note the statistical significance in the 2SLS results of block holders. While generally statistically insignificant these are now statistically significant, particularly for the post-GFC period. It is possible that the GFC period has resulted in a shift from insider ownership to block holdings as a control for agency costs. Certainly, the post-GFC period saw considerable public criticism of insider remuneration and this may partially explain the movement from insider ownership to block ownership as explanatory variables for asset utilisation during this period.

[INSERT TABLE 4 ABOUT HERE]

Our chosen governance variables include board size (BSIZE) and CEO-chair duality (ICHAIR). There is a range of variables that could be chosen to capture governance though recent literature suggests that these variables could be useful in capturing the impact of governance on asset utilisation (Henry 2010). Similar to the results for insider ownership, board size is statistically significantly related with asset efficiency for each of the analyses except for the 2SLS least squares analysis for the post-GFC period. The coefficients are generally negative consistent with the proposition that larger boards make less efficient use of their assets though this not the case in the post-GFC period. It is important to note that the CEO-chair duality dummy variable is statistically significant in the pre-GFC period though this is only found with the pooled OLS results and not with the 2SLS results. It would seem that the GFC has had a considerable impact on the link that exists between board structure and asset utilisation. It is possible that board governance has been tightened up considerably following the GFC. It may now be much more difficult for a CEO to sway a large board into allowing wasteful asset utilisation practises to continue.⁸

The debt variables are important determinants of asset utilisation in our sample, this is particularly so in the post-GFC period. While Henry (2010) finds little support for debt, McKnight et al (2009) finds considerable support for the role of debt in the ensuing that assets are used efficiently. We extend prior analysis to include the impact of debt structure as well as total debt and obtain a richer set of results. For example, we find that short term debt as a proportion of total debt is positively related with asset utilisation. This is not surprising as bank monitoring is more intense for firms with higher levels of short term debt. The result for total debt is unexpected given the results reported by McKnight et al (2009). Total debt is negatively related with asset utilisation with this effect most evident in the post-GFC period.

⁸ While not statistically significant it is interesting to note the positive coefficient on board size and the negative coefficient on CEO-chair duality in the post-GFC period. The insignificant post GFC results suggest that large boards may now be monitoring more effectively and that powerful CEOs are taking somewhat more care of the firm.

While unexpected this is probably not surprising because it is expected that debt laden firms have struggled following the crisis and so this lower level of asset utilisation may well result from poor overall performance associated with high debt levels and poor economic conditions.

The growth options variable is positively correlated with asset utilisation for each of the sub-periods reported in Table 4. It would appear that firms with greater levels of growth options use their asset more efficiently. Book to market ratio rarely appears in studies of this nature and so this would appear to be an important control. We note similar results for firm size, with positive and statistically significant estimated coefficients. Apparently, larger firms tend to use their assets more efficiently in our sample of the largest 500 Australian firms. Similar size effects are also reported by McKnight et al (2009) as well as in the instrumental variables analysis reported by Henry (2010).

4.2. Discretionary expenses (DER)

The results from analysis of the DER appear in Table 5. As with the AUR results discussed above, Columns (2) through (4) cover the results from pooled OLS regressions and columns (5) to (7) are devoted to the 2SLS results. The estimated models are also statistically significant in all cases though the R square values are somewhat lower and range from 0.1 to 0.3. The 2SLS coefficient estimates for INSOWN are statistically significant and negative for the post-GFC period and for the full period and this is also reflected in the pooled OLS post GFC period results. These results are contrary to those reported by Henry (2010) though, again this may be driven by the extreme post GFC economic conditions that firms had to deal with in 2010 and 2011. Nevertheless, during the post-GFC period it appears that higher levels of insider ownership were associated with lower levels of discretionary expenses.

Consistent with Henry (2010) we find that board size coefficients are statistically significant and positive in all cases. This suggests that larger boards are associated with higher levels of discretionary expenses. This result contrasts with the asset utilisation result reported above for the post-GFC period. While it is difficult to reconcile these results this inconsistency is also evident in the work of Henry (2010). It may be that discretionary expenses are harder to control at the board level compared with asset utilisation.

While not as pervasive the impact of monitoring associated with debt is still evident in the DER based analysis. While there is no evidence of statistically significant sub period short term debt coefficients there is a statistically significant negative effect observed for the full period. Thus, the higher the level of short term debt that the firm holds the lower the levels of discretionary expenses that the firm tends to incur. This is consistent with the asset utilisation result reported above. The monitoring associated with short term debt appears to reduce the level of agency costs. The results for total debt are somewhat more complex as the total debt coefficient is statistically significant and negative in the pre-GFC period and statistically significant and positive in the post-GFC period, given the 2SLS results. Apparently, in the pre-GFC economic conditions higher levels of debt resulted in lower levels of discretionary expenses though in the post-GFC period this is reversed with those firms those firms with high levels of debt exhibiting greater levels of discretionary expenses. These post-GFC period results are consistent with the total debt results reported for asset utilisation. It is possible that in the more turbulent post GFC economic conditions, firms with higher levels of debt struggle to maintain sales and so discretionary expense ratios are elevated as a result.

Unexpectedly, growth options are also positively correlated with discretionary expenses for the full period though there is no evidence of statistical significance for the sub-periods. Firms with greater levels of growth options incur higher levels of discretionary

expenses. We note that the firm size coefficient is negative and statistically significant consistent with the asset utilisation results. Larger firms exhibit lower levels of agency costs than smaller firms in our sample. Apparently, larger firms tend to incur proportionally less discretionary expenses in our sample of the largest 500 Australian firms. Similar size effects are also reported by Henry (2010) in his instrumental variables based analysis.

5. Conclusions

This study examines the influence of ownership, board and debt on two proxies used to capture agency costs, AUR and DER. We use panel data in our analysis, with separate panels of 500 firms for each of the years 2004, 2005, 2010 and 2011, and analyse the data using both pooled OLS and 2SLS random effects panel analysis. This allows us revisit the question of what determines the level of equity agency costs as well as to consider the impact the global financial crisis on the level of these costs for our sample of Australian firms. Our sample is quite different from that of Henry (2010) which covers a considerably more stable period from 1992 to 2002 prior to the implementation of the governance code and includes a much smaller number of Australian firms. The results from the multivariate analysis are generally consistent with earlier work (Ang et al. 1999; Singh and Davidson 2003; McKnight and Weir 2009 Florackis and Ozkan 2005) and extend upon the more recent work of Fleming et al (2005) and Henry (2010).

There are a number of contributions that our analysis makes to the literature. We find that insider ownership has different impacts on agency costs depending on whether we look at the pre-GFC period or the post-GFC period. In the pre-GFC period there is evidence of statistically significant positive asset utilisation effect though in the post-GFC period insider ownership appears to have greatest impact on discretionary expenses. Further block ownership appears to be more important in controlling asset utilisation in the post-GFC

period. Board structure also has a role to play in the determination of agency costs. In virtually all cases larger boards are associated with greater levels of agency costs. The only exception is in the post-GFC period with respect to asset utilisation. We find little evidence of CEO-chair duality effects. One source of agency cost control that we explore in greater detail is the monitoring provided by lenders. We include two variables, one for short term debt relative to long term debt and the other for total debt. This provides quite a rich story as we find that the greater the proportion of short term debt that the firm holds the lower the level of agency costs that it incurs. This result is an important contribution as there is little support for debt based monitoring in the literature.⁹ The effect of total debt varies with the agency cost proxy and study period and this is consistent with the literature. Finally, we note that our controls for growth options and firm size capture important variation in our data though the impact of growth options is sensitive to agency cost proxy.

Much of the data used in this study was manually collected though newer data sets are becoming available that will allow considerable extension of the analysis that we report in this paper. For example as analyst coverage extends to more Australian firms this variable could prove useful in analysis of agency costs. Similarly, CEO compensation and institutional holdings could be included in the analysis to provide a richer explanation of the determinants of agency costs. We leave these extensions to future research.

⁹ It is possible that better measures of debt based monitoring are required in order to tease out this effect.

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Table 1. Sample firm GICS industry classifications

GICS Industry	Average Market Capitalisation (AUD 000s)	Number of firm-year observations	% of firm-year Sample
Consumer Discretionary	838,820.5	248	12.4
Consumer & Staples	3416,743.0	80	4.0
Energy	1,727,242.0	158	7.9
Financials	3,484,312.0	384	19.2
Health Care	793,111.4	154	7.7
Industrials	913,610.6	296	14.8
Information Technology	326,679.0	110	5.5
Materials	2,896,792.0	494	24.7
Telecommunication Services	5,960,182.0	38	1.9
Utilities	1,059,901.0	38	1.9
Total	2,109,264.0	2000	100.0

This table provides summary information on the sample firms used in analysis. The analysis is organised by GICS industry classification and refers to the sample years chosen for this study, 2004, 2005, 2010 and 2011.

Table 2. Variable Definition.

AUR (Asset Utilisation ratio)	the ratio of annual sales to total assets.
DER (Discretionary Operating Expense ratio)	the ratio of discretionary operating expenses to total sales.
BLOCK	The percentage of ordinary shares held by shareholders who own 5% or more of these shares
INSOWN	the percentage of ordinary shares held by the board
BSIZE	the number of directors on the board
IODIR	the ratio of the number of independent outside directors to the total number of directors on the board
ICHAIR	dummy variable equals to 1 where the chair is independent, and 0 otherwise
SDEBT	the ratio of short-term debt to total debt.
TDEBT	the ratio of total debt to total assets
FSIZE	natural log of annual sales
FMKB	The ratio of the book value of assets less shareholder equity plus the market value of equity to the book value of assets.
DFIN	dummy variable equals to 1 for financial firms and 0 otherwise
INDUSTRY	a set of dummy variables for ten GICS industry classifications (refer to Table 1)
NLAR5	The number of shareholders holding more than 5% of the value of the firm. This is used as an instrument for INSOWN in 2SLS estimation, along with the other exogenous variables appearing in the model.

Table 3. Descriptive statistics

	Mean (2004)	Mean (2005)	Mean (2010)	Mean (2011)	Mean (all)	Std. Dev. (All)	Min (all)	Max (all)
AUR	0.8385	0.8147	0.6291	0.6624	0.7362	0.8396	0.0000	5.7667
DER	0.1763	0.2208	0.3943	0.4003	0.2979	0.2473	0.0010	0.9902
BLOCK	41.1426	40.8760	45.5777	48.0756	43.9180	21.1092	0.0000	99.7200
INSOWN	16.7578	15.0070	9.4341	10.4485	12.9119	18.5256	0.0000	98.2577
BSIZE	6.3000	6.5100	6.4840	6.5740	6.4670	2.1197	3.0000	16.0000
ICHAIR	0.6280	0.8260	0.9400	0.9380	0.8330	0.3731	0.0000	1.0000
SDEBT	0.3332	0.3293	0.2442	0.2586	0.2913	0.3407	0.0000	1.0000
TDEBT	0.1975	0.2230	0.1431	0.1360	0.1749	0.1812	0.0000	1.3499
FSIZE	11.1142	11.2126	10.9475	11.2653	11.1349	2.9384	0.6570	18.1006
FMKB	2.1128	2.0297	2.1038	2.1524	2.0997	2.2427	0.0262	36.8014
TSALE	874645.2	923005.2	1561470.0	1692472.0	1262898.0	5169664.0	1.9	72600000.0
TASSET	3979594.0	4644613.0	7483539.0	8040842.0	6037147.0	46200000.0	422.0	752000000.0
MCAP	1359326.0	2120378.0	2505739.0	2451613.0	2109264.0	10700000.0	2322.3	233000000.0

This table provides selected descriptive statistics for variables used in the analysis. TSALE (total sales), TASSET (total assets) and MCAP (market capitalisation) provide different measures of size. TSALE is used as a proxy for firm size (FSIZE) in the later analysis. The mean value of the variables is reported for each of the years that make up the data set (2004, 2005, 2010 and 2011) for the 500 largest Australian listed firms. Standard deviation (Std. Dev. (all)), Minimum (Min (all)) and Maximum (max (all)) are also reported for the pooled data set (all) consisting of the 4 years selected for analysis. Refer to Table 2 for definitions of variables referred to in this table.

Table 4. Multivariate analysis for Asset Utilisation ratio (AUR)

This table reports the estimation results of model (1) for AUR. Columns 2 to 4 refer to pooled OLS regression with standard errors adjusted for clustering at the firm level. Columns 5 to 4 refer to 2 stage least squares adjusted random effects panel data analysis. Variables are defined in Table 2. ** (*) indicates statistical significance at the 5% (10%) level. An F statistic is reported for the pooled OLS analysis and a Wald statistic is reported for the 2SLS analysis.

	OLS pooled ALL	OLS pooled Pre-GFC	OLS pooled Post-GFC	2SLS RE Panel ALL	2SLS RE Panel Pre-GFC	2SLS RE Panel Post-GFC
INSOWN	0.0051** (3.88)	0.0067** (4.62)	0.0028** (2.15)	0.0117** (3.86)	0.0129** (3.73)	-0.0014 (-0.23)
BLOCK	-0.0012 (-1.10)	-0.0009 (-0.74)	-0.0014 (-1.40)	-0.0028** (-3.00)	-0.0016 (-1.08)	-0.0016* (-1.92)
BSIZE	-0.0678** (-6.48)	-0.0807** (-6.65)	-0.0554** (-5.77)	-0.0339** (-4.78)	-0.0202* (-1.70)	0.0007 (0.11)
ICHAIR	0.0998* (1.89)	0.0946* (1.67)	0.1031 (1.44)	0.0418 (1.34)	0.0037 (0.11)	-0.0042 (-0.13)
SDEBT	0.3435** (5.62)	0.5040** (5.87)	0.2300** (4.47)	0.1509** (4.95)	0.1582** (3.36)	0.0662** (2.80)
TDEBT	-0.4314** (-3.34)	-0.1837 (-1.16)	-0.6542** (-6.02)	-0.1982** (-2.88)	0.0951 (1.04)	-0.1604** (-2.12)
FSIZE	0.1422** (13.35)	0.1551** (14.99)	0.1333** (14.31)	0.1283** (18.07)	0.1182** (9.00)	0.0837** (12.53)
FMKB	0.0331** (3.53)	0.0448** (2.44)	0.0245** (3.75)	0.0227** (3.95)	0.0293** (2.77)	0.0076** (2.35)
Industry and year dummies	yes	yes	yes	yes	yes	yes
R square	0.47	0.44	0.52	0.43	0.39	0.48
F statistic or Wald statistic	32.73**	35.78**	51.84**	851.79**	317.29**	377.17**
N	2000	1000	1000	2000	1000	1000

Table 5. Multivariate analysis for Discretionary Operating Expense ratio (DER)

This table reports the estimation results of model (1) for DER. Columns 2 to 4 refer to pooled OLS regression with standard errors adjusted for clustering at the firm level. Columns 5 to 4 refer to 2 stage least squares adjusted random effects panel data analysis. Variables are defined in Table 2. ** (*) indicates statistical significance at the 5% (10%) level. An F statistic is reported for the pooled OLS analysis and a Wald statistic is reported for the 2SLS analysis.

	OLS pooled ALL	OLS pooled Pre-GFC	OLS pooled Post-GFC	2SLS RE Panel ALL	2SLS RE Panel Pre-GFC	2SLS RE Panel Post-GFC
INSOWN	-0.0002 (-0.67)	0.0004 (1.34)	-0.0011** (-2.27)	-0.0025** (-2.21)	-0.0007 (-0.78)	-0.0099** (-2.56)
BLOCK	0.0000 (-0.16)	-0.0003 (-1.16)	0.0005 (1.19)	0.0003 (0.82)	0.0001 (0.23)	0.0007 (1.06)
BSIZE	0.0143** (4.36)	0.0119** (3.31)	0.0168** (4.22)	0.0105** (3.53)	0.0092** (2.42)	0.0135** (2.68)
ICHAIR	0.0151 (0.97)	0.0167 (1.26)	-0.0204 (-0.65)	0.0012 (0.08)	0.0109 (0.83)	-0.0570* (-1.88)
SDEBT	-0.0350** (-2.02)	-0.0192 (-1.09)	-0.0253 (-1.11)	-0.0358** (-2.57)	-0.0232 (-1.36)	-0.0087 (-0.42)
TDEBT	-0.0417 (-1.22)	-0.0529* (-1.73)	0.0386 (0.79)	-0.0151 (-0.51)	-0.0695** (-2.18)	0.1530** (2.32)
FSIZE	-0.0298** (-10.24)	-0.0099** (-3.48)	-0.0510** (-14.49)	-0.0320** (-12.22)	-0.0099** (-3.04)	-0.0653** (-11.70)
FMKB	0.0055* (1.81)	0.0031 (0.90)	0.0045 (1.29)	0.0039* (1.62)	0.0035 (1.00)	-0.0012 (-0.40)
Industry and year dummies	yes	yes	yes	yes	yes	yes
R square	0.29	0.09	0.28	0.27	0.08	0.17
F statistic or Wald statistic	30.84**	5.88**	22.86*	697.19**	94.17**	164.13**
N	2000	1000	1000	2000	1000	1000