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Received December 2011  
Revised March 2012  
Accepted March 2012

# Impact of cash holdings and ownership concentration on firm valuation

## Empirical evidence from Australia

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### Abstract

**Purpose** – The purpose of this paper is to investigate the impact of firms' cash holdings and ownership concentration on the firms' valuation using an unbalanced panel dataset of non-financial listed firms in Australia.

**Design/methodology/approach** – The author used a generalized method of moments approach suitable for unbalanced panel dataset to examine the impact of firms' cash holdings and ownership concentration on firms'  $q$ -ratios after controlling for the impact of financing, dividend and investment decisions, respectively.

**Findings** – The paper finds a positive relationship between cash holdings and  $q$ -ratio of Australian firms. The ownership structure moderates the effect of cash holdings on  $q$ -ratio in asymmetric fashion, i.e. for widely held firms, there is a positive relationship between cash holdings and  $q$ -ratio; while for closely held firms, there is significant negative relationship between cash holdings and  $q$ -ratio. Furthermore, changes associated with corporate governance reforms, also effect  $q$ -ratio besides ownership structure. The paper also examined the impact of cash holdings on the market value of the firms over time. As the author predicted, increase in the cash holdings has a negative effect on the firms' market valuation, and this effect slows down over time. Overall, the empirical analysis finds support for similar findings documented for the developed countries in the literature.

**Research limitations/implications** – The sample consists of non-financial listed firms over the period of 1995 to 2010.

**Practical implications** – The results imply that widely-owned firms have lower cash holdings because managers are able to access capital market easily compared to firms with concentrated ownership, which might have complex agency and information asymmetry problems. These findings are consistent with the agency costs. Managers in less widely-held firms have more discretion over cash holding policies, and the value reduction imposed on these firms may reflect shareholders' recognition of the possibility of managerial expropriations.

**Originality/value** – This is believed to be the first paper to explore agency costs of cash holdings for Australian firms.

**Keywords** Australia, Corporate finances, Corporate ownership, Cash management, Cash holdings, Free cash flows, Agency theory

**Paper type** Research paper



Review of Accounting and Finance  
Vol. 11 No. 4, 2012  
pp. 448-467  
© Emerald Group Publishing Limited  
1475-7702  
DOI 10.1108/14757701211279196

### 1. Introduction

Efficient allocation of firms' resources is vital for firms' growth, shareholders' wealth maximization and sustainability. Myers and Rajan (1998) argue that, liquid assets can be turned into private benefits at lower cost than other assets. In agency costs literature, there are two polar views on the role of management in wealth maximization.

On one hand, the “alignment” hypothesis states, a high managerial ownership and good internal governance have positive impact on firm valuation (Jensen and Murphy, 1990). A high managerial ownership implies that, managers are less likely to divert resources away from value maximization as they bear part of the costs of their actions. Furthermore, lower expected agency costs due to the alignment of interests are likely to increase the firm’s ability to raise external finance, which would reduce firms’ incentives to accumulate cash. On the other hand, the “entrenchment” hypothesis states, a high managerial ownership have negative effect on firm performance, growth and valuation. At higher levels of managerial ownership, outside shareholders may find it difficult to monitor the actions of managers because greater ownership gives managers more direct control over the firm, increasing their ability to resist outside pressures (Ozkan and Ozkan, 2004).

The main objective of this paper is to investigate the relationship between cash and  $q$ -ratio, based on the agency costs and managerial entrenchment theories. We choose Australia for several reasons. First, corporate governance of the Australian firms have received considerable interest in the recent studies (Fleming *et al.*, 2005; Hsu and Koh, 2005; Henry, 2004). In the past, a greater proportion of the Australian firms had very low institutional ownership, as noted by Stapledon (1998). In Dignma and Galanis (2004) view, Australia’s corporate governance is representative of an “insider” system. Shareholding is concentrated in the hands of large blockholders, who focus more on the current earnings than firms’ corporate governance. Thus, a lack of control over managerial opportunism provides managers leeway to indulge in the hoarding and wastage of valuable cash.

Australian Stock Exchange (ASX) Corporate Governance Council announced “Principles of good corporate governance and best practices recommendations” for the Australian listed companies in March 2003 (Henry, 2004, p. 421)[1]. In particular, it requires companies to define the board’s internal workings and responsibilities in various committees. We argue that the disclosure of information flows after adoption of these practices would allow directors to exert power and challenge dominant shareholders. So far, though, little evidence exists that these reforms have curbed controlling shareholders’ abuses of firms’ valuable resources. Liquid assets such as cash present a promising opportunity to investigate the agency costs of cash holdings.

This paper is motivated by the fact that none of the previous studies have examined the cash holdings from agency costs perspective in Australia. Previous studies have examined the influence of Australian corporate governance reforms in different contexts (Tian and Twite, 2011; Brit *et al.*, 2006; Koh, 2003). This paper is organized as follows: a review of literature related to the cash holdings, ownership and rationalization of their relationship with firm value is given in Section 2; data and methodology are explained in Section 3, and empirical results are reported in Section 4. Section 5 concludes.

## 2. Review of literature

Empirical enquiry into the cash holdings of the non-financial firms started from Vogel and Maddala (1967) who found that cash balances have tendency to decline over time, and larger firms tend to have lower cash holdings. Baskin (1987) concluded that firms use liquid assets (cash) to create entry barriers in the markets, which enable firms to rapidly preempt new opportunities, and other studies (Harford *et al.*, 2005, 1999) show

that the cash holdings enable firms to make diversifying acquisitions. Dosoung and Sangsoo (1997) report that valuation consequences of targeted share repurchases are positively correlated with the level of firms' free cash flows and with the pre-repurchase build up of liquid assets. Opler *et al.* (1999) examined the differences in the cash holdings of the US firms, and concluded that, firms with strong growth opportunities and volatile cash flows hold relatively higher cash holdings compared to the firms that have the greatest access to capital markets and high credit ratings. Luo and Hachiya (2005) examined the impact of firms' cash holdings on the firm value using average ratio of bank shareholding as indicator of corporate governance effectiveness for a sample of Japanese firms. They found that, the ratio of bank shareholding has a non-linear relationship with firms' Tobin's *q*-ratio. Japanese banks do not adequately monitor the managers' use of cash holdings which lead to agency conflicts, for firms with closer bank relations (p. 69).

Several researchers have investigated the cash holdings in international samples. Rajan and Zingales (1995) investigated the firms' cash holdings in G7 countries. They found that Japanese firms have higher cash and short-term investments. Dittmar *et al.* (2003) investigated the effect of agency costs on the firms' cash holdings using a sample of 45 countries. They found that, the firms in countries with the lowest level of shareholder protection hold almost 25 percent more cash than firms in countries with the highest level of shareholder protection, after controlling for industry effects[2]. Lee *et al.* (2004) investigated the determinants of cash and liquid assets across for 35 countries and concluded that the empirical evidence on the determinants of liquid asset holdings is largely consistent with agency costs theories. In another related study, Pinkowitz *et al.* (2006) found that the relationship between cash holdings and firm value is much weaker in countries with poor investor protection. Faulkender and Wang (2006) examined the cross-sectional variation in the marginal value of corporate cash holdings that arise from difference in corporate financial policy. They found that the marginal value of cash holdings declines with larger cash reserves, higher leverage, and access to capital markets.

Several other alternative explanations have also emerged for differences across countries in the patterns of cash holdings. From product market competition perspective, Haushalter *et al.* (2007) argue that when a firm shares a larger proportion of its growth options with rivals in the industry, its cash reserves acts as a buffer, and it provides a firm preemptive advantage to enter into new markets. Ramirez and Tadesse (2009) provide a cultural explanation behind higher (lower) cash holdings. They report that firms in countries with high uncertainty avoidance hold more cash as a way to hedge against undesired states of nature. From organizational structure perspective, Subramaniam *et al.* (2011) argue that the use of cash holdings depends on focus of organization's operations. They report that diversified firms hold significantly less cash than their counterparts. Iskandar-Datta and Jia (2012) suggest that agency cost explanations and functioning of the financial system is crucial understanding the cash policies of firms across industrialized countries.

### 3. Hypothesis, data and methodology

According to Opler *et al.* (1999), managers obtain two main benefits from cash holdings. First, managers save transaction costs that would be incurred on raising new funds from the capital markets. Second, managers can use cash to finance investments if other sources of funding are not available. Higher cash reserves can be injected into positive

NPV projects (Myers and Majluf, 1984). Theoretically, availability of cash allows managers to make relatively quicker investment decision which are positively valued by the shareholders, if such investment prevents underinvestment in positive NPV projects. On the contrary, an investment decision is negatively valued by the shareholders, if such investment facilitates overinvestment in negative NPV projects or outright stealing by entrenched managers. Due to fear of managerial expropriation and overinvestment, Jensen (1986) suggests that, in the absence of growth opportunities, shareholders may want the excess cash to be returned in the form of higher dividends, or managers should repurchase their shares for cash, which will reduce the level of free cash flows that otherwise be invested in wealth decreasing investment projects. When managerial discretion is higher due to weaker governance, investors discount such firms. This valuation discount is related to the potential for managerial expropriation that accompanies high levels of insider control (Kalcheva and Lins, 2007). Thus, we hypothesize:

*H1. Ceteris-paribus*, there is a positive relationship between cash and  $q$ -ratio.

Higher managerial shareholding allows these managers to expand firms beyond their optimal size that destroys firms' valuation. As Jensen (1986) points out that, cash reserves are easily accessible by the managers with little or no scrutiny. In the absence of good governance managers have tendency to waste free cash flows and the value of cash reserves constitutes a significant fraction of firms' value (Demsetz and Lehn, 1985; Dyck and Zingales, 2004; Dittmar and Mahrt-Smith, 2007), in other words, ill use of cash lowers the valuation of the firms. Indeed, Kusnadi (2011) remarks that agency conflicts between managers and minority shareholders lead to entrenched managers having more discretion to hoard cash reserves in the absence of good governance. Thus, we hypothesize:

*H2. Ceteris-paribus*, there is a negative relationship between insider ownership and  $q$ -ratio.

We hypothesize that more widely held firms to be different from less widely held firms in terms of cash holding; for this reason, there would be asymmetry in the impact of cash on the firm value. In order to test this, we used the interaction of insider ownership and cash. Different types of block holders have different type of monitoring (Dong and Ozkan, 2007). Almazan *et al.* (2005) report that pressure-sensitive institutional investors, e.g. banks, and pressure insensitive institutional investors, such as investment firms have different impact on the managers. Anderson and Hamadi (2009) also argue that the greater cash holdings are largely motivated by insiders' risk aversion. They report that the level of liquid asset holding (cash) is positively associated with ownership concentration:

*H3. Ceteris-paribus*, the percentage of insider shareholding moderates the effect of cash on firm value asymmetrically.

Firms adopt corporate governance codes to maximize shareholder value; however controlling shareholders or the management may prevent the adoption of sound governance mechanisms because there is implementation costs associated with such adoption. In addition, corporate governance codes might reduce controlling shareholders' ability to expropriate shareholders. Many studies find strong positive association

between corporate governance and firm value (Kusnadi, 2011; Chhaochharia and Laeven, 2009; Gompers *et al.*, 2003). We argue that corporate governance reforms marks a turning point in monitoring and oversight of Australian firms reminiscent of structural change. Therefore, to test the impact of this structural change, we used a CRG dummy variable to capture a structural change due to a regulatory reform on corporate governance for widely held firms in Australia. *CRG* is equal to 1 for the years 2004-2010 and 0 for the years 1995-2003 to test following hypothesis:

*H4. Ceteris-paribus*, there is a positive relationship between corporate governance practices implemented and *q*-ratio.

### 3.1 Data

We obtained firm level financial and ownership data from “Worldscope” database over the period of 1995-2005 for all the non-financial listed Australian firms. Consistent with the previous empirical studies, we excluded the financial firms. Previous studies suggest that liquidity of financial firms is hard to assess, and furthermore financial firms are constrained by regulations to maintain a specific cash reserves all the time. The final sample that met the data requirement of at least three years of consecutive financial and ownership data consisted of an unbalanced panel dataset of 389 firms from 1995 to 2005. We argue that liquidity concerns and optimal cash holdings decisions affect firms’ solvency which influence firms’ capital structure choices (Gryglewicz, 2011). Therefore, we also examined the changes in the sources of cash over the years. We obtained the New Equity, New Long Term Debt, Repurchase of Common/Preferred Equity, Common Dividends, Research & Development, and Capital Expenditure data from Worldscope. We calculated New Equity Issuance as the total new common shares issued by a firm *i* in year *t* divided by net assets in year *t* - 1; New Long Term Debt as the total new long-term debt issuance issued by a firm *i* in year *t* divided by net assets in year *t* - 1, and Repurchase of Common/Preferred Equity as the purchase of total common/preferred equity by a firm *i* in year *t* divided by net assets in year *t* - 1.

### 3.2 Methodology

The existing studies argue that a firm’s cash holding is an endogenous variable[3], and this endogeneity problem must be addressed in the estimation framework to draw correct inference from the estimation results. There are several useful approaches that could be considered such as, the recursive estimation method using state space method and Kalman filter approach, however these approaches requires balanced panel dataset. We used GMM estimation technique because it is not only ideal solution for the endogeneity problem associated with endogenous regressors such as ownership and cash holdings but it can also be used for unbalanced panel data (Brown *et al.*, 2009). We estimate the following equation using a forward orthogonal deviations transformation and level variables dated *t* - 2 to *t* - 4 as instruments:

$$\begin{aligned}
 q\_ratio_{i,t} = & \alpha_i + \beta_1 CASH_{i,t} + \beta_2 OWN_{i,t} + \beta_3 CASH_{i,t} \times OWN_{i,t} \\
 & + \beta_4 CRG_t + \beta_5 OWN_{i,t} \times CRG_t + \beta_6 CASH_{i,t} \times OWN_{i,t} \times CRG_t \\
 & + \beta_7 RD_{i,t} + \beta_8 DIV_{i,t} + \beta_9 CAP_{i,t} + \beta_{10} DEBT_{i,t} \\
 & + \beta_{11} SIZE_{i,t} + Ind + d_t + v_{i,t},
 \end{aligned} \tag{1}$$

where for a firm  $i$  at time  $t$ ,  $q$ -ratio is the market value of equity plus book value of debt divided by total assets (Chua *et al.*, 2007).  $CASH$  is total cash and cash equivalents divided by total net assets defined as total assets less cash and cash equivalents.  $OWN$  denotes the percentage of ordinary common shares held by the insiders.  $CRG$  is a dummy variable, which is equal to 1 for the years 2004-2010 and 0 for the years 1995-2003. We also included control variables used in the previous studies of cash holdings, such as research and development expenses divided by total net assets (RD). Brown and Petersen (2011) report that firms mostly likely to face financing frictions rely extensively on cash holdings to smooth R&D. Total cash dividends, calculated as the total cash divided by total net assets ( $DIV$ ); total capital expenditure divided by total net assets ( $CAP$ ); total debt to total assets ratio ( $DEBT$ ).  $SIZE$  is calculated as the natural logarithm of total assets. The model includes also firm effects ( $\alpha_i$ ) time effects ( $d_t$ ) and industry dummies ( $IND$ ).  $v_{i,t}$  is the residual term.

Our main research objective is to investigate the impact of cash on firm value and how this impacts changes once we include the corporate governance reforms. We extend our investigation using sub-groups of ownership. We sub-divided ownership into three mutually exclusive groups using information about the percentage of shares held in each firm. We used percentage of closely held shares denoted by  $OWN$  instead of dummy variables in our regression as valuable information would be lost by employing the latter approach. The first group denoted by  $k_1$  consists of firms in which percentage of closely held shares < 10 percent;  $k_2$ , in which percentage of closely held share is between 10 and 50 percent, and  $k_3$ , in which percentage of closely held shares is between 51 and 100 percent[4].

Our particular focus is on the coefficients of  $CASH$ ,  $OWN$  and interaction term  $CASH \times OWN$  which explains the impact of insiders' shareholding on firm value through its impact on cash holdings of a firm. Theoretically, an extra dollar of cash added to the firm would cause its market value to go up by one dollar in more widely held owned firms compared to the less widely owned firms. Andersen and Reeb (2003) report that closely held firms perform better than widely held firms among S&P 500 firms, in particular, when family members serve as CEO, performance is better than with outside CEOs. The triple interaction term  $CASH \times OWN \times CRG$  is useful to determine any direct (indirect) effect corporate governance reforms might have on cash holding due to the changes in the financing, dividend and investment policies which are accompanied by changes in the ownership and style of corporate board decision making. We expect that cross-sectional differences in the adoption of the corporate governance reforms would further moderate the impact of ownership on the cash. In this regard, early adopters of corporate governance best practices would be able send credible signal to the market about their intentions, with reference to managerial involvement in the strategic decision making.

## 4. Results

### 4.1 Descriptive statistics

Table I shows the averages of the firm level explanatory variables by year (see Panel A), and by GICS-2 digit industry sectors in Panel B. Prior to corporate governance reforms,  $OWN$  in the sample firms varied from a low of 30.54 percent in 2000 to a high of 42 percent in 2002. In the years after reforms, there has been gradual decrease in  $OWN$ .  $CASH$  decreased except for three years (1999-2001) in the pre-reform period. After reforms,



**Table I.**  
Time series, averages and  
descriptive statistics

Years	Panel A: average values by year										RD
	OWN	CASH	q-ratio	S	B	REP	DPO	CAP	RD		
1995	32.3969	2.4262	1.2607	1.3449	0.0841	0.0001	32.3907	0.0872	0.2002		
1996	31.3271	2.1588	2.1488	0.7007	0.1154	0.0027	43.6435	0.0966	0.2833		
1997	31.1622	1.5399	1.7887	0.4059	0.1166	0.0043	33.6244	0.1005	0.2895		
1998	34.6311	2.0191	1.6882	1.2732	0.1024	0.0006	34.5629	0.1129	0.3992		
1999	31.3452	2.2663	2.8639	1.0328	0.0876	0.0045	33.6133	0.0812	0.5716		
2000	30.5432	2.4563	2.8755	1.1031	0.1198	0.0034	26.5980	0.1326	1.9017		
2001	34.9670	3.4988	2.4890	1.7764	0.0848	0.0054	16.0479	0.4044	0.1933		
2002	42.2351	1.1695	2.5525	0.8048	0.2302	0.0132	11.7636	0.2791	0.2206		
2003	42.6465	1.6506	4.5767	1.0453	0.1101	0.0168	14.9429	0.2705	0.3206		
2004	40.5681	2.8792	2.6544	2.2481	0.0803	0.0026	14.3229	0.2082	0.2919		
2005	40.5152	2.1084	3.7477	1.5039	0.3100	0.0139	14.1748	0.1743	0.4606		
2006	41.1429	2.2884	3.9832	1.1672	0.1353	0.0032	15.8897	0.2822	0.4108		
2007	38.2049	5.3787	3.8886	3.7882	0.0844	0.0077	14.7760	0.4336	0.3173		
2008	36.4265	1.9216	2.8120	1.1090	0.1297	0.0073	15.2782	0.2367	0.3224		
2009	37.7527	1.4806	2.7514	0.3902	0.0768	0.0026	13.6704	0.1694	0.2725		
2010	39.5715	1.7655	3.9752	1.4830	0.1375	0.0053	13.2837	0.1729	0.4145		
Panel B: average values by GICS-2 digit industry sector classification											
GICS	OWN	CASH	q-ratio	S	B	REP	DPO	CAP	RD		
10	30.3936	2.6837	4.3996	2.5523	0.1876	0.0020	6.5902	0.5036	0.0386		
15	35.5288	2.9599	3.2564	1.8791	0.1110	0.0092	9.9828	0.4203	0.0520		
20	40.5455	0.5853	2.0613	0.5331	0.1220	0.0007	25.9664	0.0726	0.0390		
25	48.3648	0.6383	2.1235	0.2758	0.1200	0.0168	30.4346	0.0714	0.0883		
30	39.8214	0.1398	1.2992	0.0582	0.1662	0.0024	34.7079	0.0652	0.0034		
35	32.5865	4.6429	3.9032	3.1291	0.0645	0.0074	7.9745	0.1747	0.6911		
45	44.1705	0.9347	5.9579	0.6156	0.1202	0.0128	15.9347	0.0663	0.1536		
50	26.0203	6.0373	1.9481	0.3789	0.1285	0.0025	22.5997	0.0671	0.0213		
55	31.8184	0.3908	2.1808	0.4055	0.0883	0.0056	14.3721	0.1272	0.1863		

(continued)

Panel C: descriptive statistics (all firms)

Variables	Mean	SD	Min.	Max.	Percentiles							
					5th	10th	25th	50th	75th	90th	95th	
<i>DPO</i>	15.390	26.8348	0.0000	98.8900	0.0000	0.0000	0.0000	0.0000	0.0000	29.4700	62.3700	76.7600
<i>OWN</i>	37.7849	25.6271	0.0000	99.0000	1.2300	4.2300	15.9300	36.0500	55.6800	55.6800	76.2500	84.8300
<i>CASH</i>	2.3263	19.9356	0.0000	929.0000	0.0075	0.0159	0.0493	0.1806	0.7202	0.7202	2.8223	7.2649
<i>SIZE</i>	3.5279	2.4159	0.0122	11.7615	0.2662	0.8154	1.8437	3.2169	4.9193	4.9193	6.9521	8.2796
<i>RD</i>	0.3679	2.5202	0.0000	92.5000	0.0000	0.0000	0.0000	0.0000	0.0444	0.0444	0.4650	1.1597
<i>CAPEX</i>	0.2356	1.7757	0.0000	60.7923	0.0000	0.0019	0.0121	0.0417	0.1163	0.1163	0.3570	0.6723
<i>S</i>	1.5105	14.8905	0.0000	661.0000	0.0000	0.0000	0.0000	0.0231	0.4057	0.4057	1.7460	4.1559
<i>B</i>	0.1044	0.5949	0.0000	20.0000	0.0000	0.0000	0.0000	0.0000	0.0676	0.0676	0.2419	0.4177
<i>q-ratio</i>	3.4558	16.0681	0.0374	518.2100	0.4716	0.5965	0.8966	1.5580	3.0113	3.0113	5.8176	8.7590
<i>REP</i>	0.0815	3.2520	0.0000	167.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0010	0.0190

**Notes:** Panel B: GICS two-digit industrial classification are: 10 – energy, 15 – materials, 20 – industrials, 25 – consumer discretionary, 30 – consumer staples, 35 – health care, 45 – information technology, 50 – telecommunication and 55 – utilities; this table shows the descriptive statistics by years (Panel A) and by industry (Panel B) based on global industry classification; *OWN* is proportion of shareholding held by the insiders of the firms as defined in the “Worldscope”; *CASH* is total cash and cash equivalents divided by net assets; *q-ratio* is sum of the market value of equity plus book value of total debt divided by total assets; *S* is new common/preferred shares issued calculated as total new common equity issued by a firm *i* in year *t* divided by total net assets in year *t* – 1; *B* is new long-term debt calculated as total new long-term debt issued by a firm *i* in year *t* divided by total net assets in year *t* – 1; dividend payout ratio is denoted by *DPO* (in percentage); *REP* is repurchase of common/preferred shares calculated as the purchase of total common/preferred shares in year *t* divided by total net assets in year *t* – 1; *CAP* is “capital expenditure” calculated as capital expenditure divided by total net assets. *RD* is calculated as the research and development expense divided by total net assets; all the data is in AUD\$ downloaded from Worldscope over the period of 1995 to 2005

Table I.



the *CASH* first decreased and then shot upward in 2007. However, from 2008 onwards, *CASH* decreased probably due the impact of global financial crisis. The *q*-ratio increased in the post-reform period compared to pre-reform period until the global financial crisis. The total amount of new equity finance doubled from its level in the pre-reform period. On the other hand, firms increased their total cash spending on research and capital expenditure by two folds in the post-reform period. Dividend payout and share repurchase activity has been much lower after the corporate governance reforms. Panel B shows average values of explanatory variables according to GICS-2 digit industry sector classification. Firms in telecommunication sectors (GICS-55) have relatively lower percentage of insider shareholdings and lower cash holdings but these firms have one of the highest spending on research and capital expenditure. Firms in the consumer discretionary (GICS-25) and Consumer staples sector have higher percentage of insider shareholdings. These firms also have the highest dividend payout and one of the lowest repurchase of shares and spending on research and development. It appears that, these firms use dividend policy to address agency costs because a promise to disburse dividend regularly alleviate manager-shareholder conflicts and can increase firm value.

#### 4.2 Sources and uses of cash holdings

In this section, we report on the differences in:

- sources of cash; and
- uses of cash.

Of particular importance is, the sales of new common and preferred shares, and the issuance of new long-term bonds as the main sources of cash. Clearly, firms have raised more money from the equity finance than long-term debt finance. In the post-reform period, the amount of total new equity finance raised was even higher than its own level in the pre-reform period. According to McLean (2011), firms increasingly issues shares for the purpose of cash savings. This increase is caused by increasing precautionary motives. Among the uses of cash, we concentrated on the research and development, capital expenditure, dividends and repurchases of shares. Noticeably, firms spent more cash on the research and development in the pre-reform period compared to the cash spent on the capital expenditure. It is intriguing to find out that overall dividend payout of the firms has declined over the years. Repurchases of common and preferred shares were higher only in the year 2000, and in the post-reforms years until 2005, after which the total repurchases of shares remained lower until the end of sample period. These results are consistent with view of Lee and Suh (2011) that share repurchases are used to distribute temporary cash flows. Panel B shows industry sectors with the highest mean cash holdings are telecommunication, building products, machinery, and software, respectively, compared to the lowest cash holdings of firms in chemical and IT services sectors. These differences suggest a cross-sectional difference in the cash holding would affect the firm value.

We also investigated whether there has been a significant increase (decrease) in the *CASH*, sources and uses of firms' cash before and after corporate governance reforms in the widely held firms as compared to closely held firms. Theoretically, we should observe that managers in diverse ownership group ( $k_1$ ) to reduce cash holdings and spend higher cash on capital development projects in the post-reform period to increase future cash flows. These firms should have more reliance on new equity to finance new projects,

and have lower dividend payout ratio. On the contrary, managers in the closely held ownership groups,  $k_2$  and  $k_3$  would increase their cash holdings because their access to external financing is limited due information asymmetry. Such firms face financial constraints and might pile up greater cash reserves for investments. However, if such firms adopt corporate governance practices to signal their “good” quality, then information about the management roles and responsibilities would lower expected agency costs due to the alignment of interests. It would increase such firm’s ability to raise external finance, which would reduce firms’ incentives to accumulate cash (Ozkan and Ozkan, 2004). At the same time, such firms might also increase dividend payout ratio to signal good future prospects and alley minority shareholders’ fears of cash expropriation.

Table II shows the results of changes in the sources and uses of cash holdings before and after corporate governance reforms in Australia. We find a significant increase in *CASH* for ownership group  $k_3$  in the post-reform period compared to pre-reform period. This result confirms the entrenchment effect. Entrenched managers are relatively free of external market discipline, and they choose to hold more cash to pursue their own interests without risking job losses. Firms hold higher precautionary cash balances when external finance is costly or income uncertainty is high (Riddick and Whited, 2009). Thus, our findings are similar to those of Denis and Sibilkov (2009) who suggest that greater cash holdings of constrained firms are value-increasing response to costly external financing. Only for the firms in group  $k_1$ , there is a significant increase in the capital expenditure in the post-reform period, which could. Furthermore, there is a significant increase in *RD* of firms in groups  $k_2$  and  $k_3$ . There is no significant increase (decrease) in *S*, *B*, and *REP* in the post-reform period. In the next section, we explore impact of firms’ cash holdings on valuation.

	Pre <10%	Post <10%	<i>t</i> -value	Pre 10-50%	Post 10-50%	<i>t</i> -values	Pre 50-100%	Post 50-100%	<i>t</i> -value
<i>CASH</i>	4.4771	1.8479	1.4510	1.6444	2.9680	0.1880	0.5922	1.7801	-3.6020*
<i>Uses of cash</i>									
<i>DPO</i>	31.3409	10.6992	6.7000*	23.1101	14.3155	4.3790*	15.9503	15.9813	-0.0130
<i>RD</i>	1.7804	0.3855	1.4444	0.1850	0.3499	-2.1821**	0.1103	0.3161	-2.1940*
<i>CAP</i>	0.1460	0.3768	-2.6470*	0.4193	0.2043	0.9360	0.0659	0.2080	-1.5605
<i>REP</i>	0.0207	0.0062	0.7281	0.0727	0.0167	0.8410	0.0022	0.2601	-1.0465
<i>Sources of cash</i>									
<i>B</i>	0.1338	0.1741	-0.5281	0.0728	0.0818	-1.2280	0.1326	0.1105	0.3461
<i>S</i>	2.0034	1.3316	0.8900	1.1367	2.1032	-0.7280	0.3198	0.9111	-2.0190**

**Notes:** Statistical significance at: \*, \*\*, and \*\*\*10 percent levels; this table reports the results of independent sample *t*-tests for mean difference in sources and uses of cash over the period of 1995-2010; pre refers to the years 1995-2003 and post refers to the years 2004-2010; *CASH* is total cash and cash equivalents divided by net assets; *q*-ratio is sum of the market value of equity plus book value of total debt divided by total assets; the sources of cash are New Equity Common/Preferred Equity Issuance (*S*) is the total new common shares issued by a firm *i* in year *t* divided by total net assets in year *t* - 1; New Long Term Debt (*B*) is the total new long term debt issuance issued by a firm *i* in year *t* divided by total net assets in year *t* - 1; dividend payout ratio is denoted by *DPO* (in, percentage). Repurchase of common/preferred equity (*REP*) is the purchase of total common/preferred equity in year *t* divided by total net assets in year *t* - 1; *CAP* is capital expenditure defined as capital expenditure divided by total net assets; *RD* is research and development expense divided by total net assets; all the data is in AUD (\$) downloaded from Worldscope over the period of 1995 to 2005

**Table II.**  
Differences in cash holdings, uses and sources of firm cash

#### 4.3 Estimation results

In this section, we report the results of estimating equation (1) using GMM panel data estimation. Our hypotheses are:  $\beta_1 > 0$ ;  $\beta_2 > 0$  (alignment view) and  $\beta_3 \neq 0$  (moderating effect). For the full sample (column 1), we find a significant positive relationship between *CASH* and *q*-ratio at the 1 percent, suggesting that cash significantly affect a firm's value. An increase of one standard deviation in cash holdings leads to an increase of AUD\$0.13 in firm value. Regarding our main variable of interest *OWN*, the estimated coefficient,  $\beta_2$  is negative but not significant. We examine the moderating impact of *OWN* through interaction term. The coefficient of this interaction term is  $\beta_3 < 0$  at 1 percent. We also find that overall sensitivity of firm valuation to cash[5]. This suggests that, for firms with relatively high control-ownership structures, market discounts the extra AUD\$1 in cash. Lastly, among the control variables, capital expenditure, research development expenditure, leverage and firm size have significant positive effect on firms' *q*-ratio.

To address the relative implementation of corporate governance reforms versus control-ownership structure at the firm level, we include *CRG* and its interaction with *CASH* and *OWN*, respectively. We do not find a significant relationship between *CRG* and *q*-ratio. The coefficient on the triple interaction term,  $CASH \times CRG \times OWN$ , is significantly positive at 1 percent, indicating that corporate governance reforms also induced changes in the relationship between cash and firm valuation besides firm level ownership-control structures.

We also report results for three mutually exclusive groups of firms' ownership. We find that *CASH* has a significant positive effect on *q*-ratio. It is the strongest for the firms in group  $k_1$ . This result suggests that, for a widely held firm, an increase of one AUD\$ in cash is associated with a 16 percent increase in a firm's value compared to a decrease of 10 percent in value for a closely held firm. The coefficient for triple interaction term,  $CASH \times CRG \times OWN$  for firms in group  $k_1$  and  $k_2$  is significantly positive. Best corporate governance practices adopted by firms lead to an increase of 68 percent increase in the value of a widely held firms compared to increase of 9 percent for a closely held firm. In sum, our findings reject the "alignment" hypothesis which suggests that, a higher insider ownership will have positive effect on firm (Table III).

#### 4.4 Value of cash holdings over time

In this section, we investigate how does agency costs of cash correlate with the value of corporate cash holdings over time. We used the valuation equation used in Bates *et al.* (2009) which related the market value of firm to the changes in firm-specific variables in a lead and lag specification[6] defined as below:

$$V_{i,t} = \alpha + \beta_1 RD_{i,t} + \beta_2 dRD_{i,t} + \beta_3 dRD_{t+2} + \beta_4 CAP_{i,t} + \beta_5 dCAP_{i,t} + \beta_6 dCAP_{t+2} + \beta_7 DIV_{i,t} + \beta_8 dDIV_{i,t} + \beta_9 dDIV_{i,t+2} + \beta_{10} OWN_{i,t} + \beta_{11} CASH_{i,t} + \beta_{12} dCASH_{i,t} + \beta_{13} dCASH_{i,t} + \beta_{14} SIZE_{i,t} + \tau_{i,t} \quad (2)$$

where  $V_{i,t}$  is the market value of the firm calculated as at fiscal year-end as the sum of the market value of equity, and the book value of long-term debt.  $dX_t$  denotes the change in the level of  $X$  from year  $t - 2$  to year  $t$ ,  $X_t - X_{t-2}$ ;  $dX_{t+2}$  is the change in the level of  $X$  from year  $t$  to  $t + 2$ ,  $X_{t+2} - X_t$ . The coefficients on these lag and lead variables represent "changes" in the variables over time. RD is research and development denoted, calculated as the total research and development expenses dividend by total net assets;

Variables	1 Full sample	2 Full sample	3 k1 (<10%)	4 k2 (10-50%)	5 k3 (50-100%)
CASH	0.0191* (0.0029)	0.1017* (0.0024)	0.0877* (0.0015)	0.0032 (0.0033)	-0.0960** (0.0437)
OWN	-0.0747*** (0.0374)	-0.9546* (0.2822)	0.5341* (0.0716)	-0.0814* (0.0247)	0.7658* (0.0372)
CASH x OWN	-0.0995* (0.0160)	-0.5636* (0.0484)	0.0084* (0.0012)	-0.1905* (0.0390)	0.1050 (0.0911)
CRG	-	-0.0551 (0.1104)	-	-	-
CRG x OWN	-	-0.5636* (0.0484)	-	-	-
CASH x	-	-	-	-	-
CRG x OWN	-	-	-	-	-
RD	0.0901* (0.0079)	0.5585* (0.0490)	0.6893* (0.1803)	0.0124 (0.0169)	0.0975* (0.0520)
DIV	-0.0526 (0.0350)	0.0226* (0.0092)	0.0329* (0.0087)	-0.0223* (0.0072)	-0.1586* (0.0182)
CAP	0.0536* (0.0341)	0.3117* (0.0375)	0.1840* (0.0626)	-0.7321* (0.1847)	0.0738 (0.2089)
DEBT	0.5815* (0.1385)	0.0717* (0.0133)	0.7146* (0.0432)	0.6860* (0.1659)	0.0899 (0.2373)
SIZE	-0.951* (0.0565)	0.4999* (0.0665)	0.1968* (0.1196)	0.8870* (0.2444)	0.0642* (0.0181)
Year dummies	Yes	Yes	Yes	Yes	Yes
No of firms	320	320	104	225	141
Obs.	1,345	1,345	249	721	354
F-test	1,538.674*	177,9870*	132,8108*	337,7708*	7,1802**
J-test	96,3354***	76,7150***	46,2637	88,5194**	108,239
p-value	(0.0899)	(0.0928)	(0.9987)	(0.0426)	(0.1426)
m <sub>1</sub>	-1.6776	-1.323	-1.6015	-1.9666	-1.6881
m <sub>2</sub>	-0.0234	-0.0922	-0.0431	-0.0060	-0.0045

Notes: Statistical significance at: \*1, \*\*5 and \*\*\*10 percent levels; the table reports the estimation results of equation (1):

$$q\_ratio_{i,t} = \alpha + \beta_1 CASH_{i,t} + \beta_2 OWN_{i,t} + \beta_3 CASH_{i,t} \times OWN_{i,t} + \beta_4 CRG_t + \beta_5 OWN_{i,t} \times CRG_t + \beta_6 CASH_{i,t} \times OWN_{i,t} \times CRG_t + \beta_7 RD_{i,t} + \beta_8 DIV_{i,t} + \beta_9 CAP_{i,t} + \beta_{10} DEBT_{i,t} + \beta_{11} SIZE_{i,t} + Ind + d_t + v_{i,t},$$

the dependent variable  $q$ -ratio is the market value of equity plus book value of debt divided by total assets;  $CASH$  is total cash and cash equivalents divided by net assets;  $CRG$  is a dummy variable used to capture a structural change due to a regulatory reform on corporate governance for firms in Australia;  $CRG$  is equal to 1 for the years 2004 to 2010 and 0 for the years 1995-2003;  $RD$  is research and development expenses divided by total net assets;  $OWN$  is the percentage of shares held by insiders defined in *Worldscope* in a firm  $t$  at time  $t$  divided into four mutually exclusive groups:  $k_1 =$  closely held shares < 10 percent,  $k_2 =$  closely held shares between 10 and 50 percent,  $k_3 =$  closely held shares between 50 and 100 percent;  $DIV$  is total cash dividends;  $CAP$  is total capital expenditure;  $DEBT$  is total debt to total assets ratio;  $SIZE$  is natural logarithm of total assets; we used a forward orthogonal deviations transformation and level variables dated  $t - 2$  to  $t - 4$  as instruments;  $J$ -test is a Sargan test statistic of over-identifying restrictions related to instruments are valid.  $m_1$  and  $m_2$ , are the  $p$ -values of the LM  $F$ -test statistics values of first and second order serial correlation in the residuals;  $F$ -test statistic reports joint significance of the explanatory variables

Table III. GMM estimation results

*DIV* is total cash dividends, calculated as the total cash dividend by total net assets; *CAP* is the total capital expenditure divided by total net assets. We followed Petersen's (2009) recommendation and estimate equation (2) using two-ways clustering of the standard errors by firms and by years.

Table IV reports estimates of the regression in equation (2). The coefficients on *DIV* are positive and significant at 1 percent (except for  $dDIV_{t+2}$ ). Change in *CASH* has a significant positive effect on the market value of the firms. Palazzo (2012) suggests that for firms with less valuable growth options, there is a positive relationship between expected equity returns and cash holdings. The term,  $dCASH_t$  is significantly positive suggesting the accumulation of cash provide buffer for the manager to spend on positive NPV investment projects valued by the market; however long-term accumulation of cash is not favored by the market, as indicated by negative coefficient on  $dCASH_{t+2}$ [7].

Variables	With industry dummies	Without industry dummies	Widely held firms	Closely held firms
Constant	3.1054* (0.0475)	2.5488* (0.0703)	3.5363* (0.1110)	3.0057* (0.0558)
$RD_t$	0.0087 (0.0128)	0.0165 (0.0138)	0.0129 (0.0163)	0.0100 (0.0132)
$dRD_t$	-0.0069 (0.0119)	-0.0130 (0.0133)	-0.0093 (0.0095)	-0.0088 (0.0126)
$dRD_{t+2}$	-0.0059 (0.0066)	-0.0070 (0.0059)	-0.0079 (0.0082)	-0.0071 (0.0061)
<i>CAP</i>	0.1271* (0.0343)	0.1524* (0.0331)	0.1381* (0.0367)	0.1359* (0.0351)
$dCAP_t$	-0.0229 (0.0146)	-0.0150 (0.0129)	-0.0114 (0.0142)	-0.0195 (0.0141)
$dCAP_{t+2}$	0.0817* (0.0348)	0.0111* (0.0336)	0.1022* (0.0356)	0.0913* (0.0351)
<i>DIV</i> <sub><i>t</i></sub>	8.0419* (1.3507)	7.3039* (1.3133)	7.1569* (1.0766)	7.8332*** (1.3510)
$dDIV_t$	-2.8094* (1.6957)	-2.6965*** (1.5624)	-2.8656*** (1.5074)	-2.7340* (2.2068)
$dDIV_{t+2}$	4.4568* (1.8762)	3.9241** (1.8234)	3.7826** (1.3400)	4.3130* (1.8379)
<i>OWN</i> <sub><i>t</i></sub>	-	0.6992* (0.1440)	0.0460 (0.0919)	0.3888* (0.0819)
<i>CASH</i> <sub><i>t</i></sub>	-0.0063*** (0.0024)	-0.0069* (0.0025)	-0.0074* (0.0030)	-0.0064* (0.0024)
$dCASH_t$	0.0005 (0.0007)	0.0002 (0.0008)	-0.0001 (0.0009)	0.0004 (0.0006)
$dCASH_{t+2}$	-0.0044* (0.0020)	-0.0056* (0.0021)	-0.0052* (0.0026)	-0.0047*** (0.0020)
<i>SIZE</i>	0.0001* (0.00001)	0.0011* (0.0001)	0.00015* (0.00002)	0.0002* (0.00002)
Adj. <i>R</i> <sup>2</sup>	0.2295	0.2590	0.2976	0.2341
<i>F</i> -test	9.9664*	10.9876*	11.0973*	11.2210*

**Notes:** Statistical significance at: \*, \*\*5 and \*\*\*10 percent levels; this table reports the estimation results of equation (2):

$$\begin{aligned}
 V_{i,t} = & \alpha + \beta_1 RD_{i,t} + \beta_2 dRD_{i,t} + \beta_3 dRD_{t+2} + \beta_4 CAP_{i,t} + \beta_5 dCAP_{i,t} + \beta_6 dCAP_{t+2} \\
 & + \beta_7 DIV_{i,t} + \beta_8 dDIV_{i,t} + \beta_9 dDIV_{i,t+2} + \beta_{10} OWN_{i,t} + \beta_{11} CASH_{i,t} \\
 & + \beta_{12} dCASH_{i,t} + \beta_{13} dCASH_{i,t} + \beta_{14} SIZE_{i,t} + \tau_{i,t} \quad (2)
 \end{aligned}$$

the dependent variable *V* is the market value of a firm *i* calculated as at fiscal year-end *t* as the sum of the market value of equity, and the book value of long-term debt;  $dX_t$  denotes the change in the level of *X* from year *t* - 2 to year *t*,  $X_t - X_{t-2}$ ;  $dX_{t+2}$  is the change in the level of *X* from year *t* to *t* + 2,  $X_{t+2} - X_t$ ; *RD* is research and development divided by total net assets; *DIV* is total cash dividends, calculated as the total cash dividend by total net assets; *CAP* is the total capital expenditure divided by total net assets; *CASH* is total cash and cash equivalents divided by total net assets; net assets are defined as total assets less cash and cash equivalents; *OWN* is the percentage of shares held by insiders in a firm *i* at time *t*; *SIZE* is natural logarithm of total assets; the standard errors are reported in parenthesis adjusted for clustering by firm and years

**Table IV.**  
Long-term valuation effect of cash holdings

In another experiment, we estimated the equation (2) separately for widely held firms in group and closely held firms in group, respectively. The results are shown in columns 4 and 5 of Table IV. In the case of widely held firms as well as closely held firms, an increase in the cash spending on *CAP* leads to a significant positive effect on market valuation. According to Bates *et al.* (2009), greater *RD* sensitivity relative to capital expenditure requires firms to hold a greater cash buffer against future shocks to internally generated cash flows. And, positive impact on firms' market valuation remains in long-term as indicated by positive coefficient of  $dCAP_{t+2}$ .

Interestingly, after splitting the sample by ownership, we find that the contemporaneous dividend policies of the firms have also significant positive impact on the market valuation. A significant negative coefficient of  $dDIV_i$  shows that any short-term decrease in payout has a negative impact on the market valuation. On the contrary, a significant positive coefficient of  $dDIV_{t+2}$  indicates that an increase in payout in long-term has a positive impact on the market valuation of the firms irrespective of ownership. We find significant negative impact of the cash holdings and changes in the cash holdings  $dCASH_{t+2}$  on the market value of the widely held firms and closely held firms. However, negative impact on the market values is relatively lower for closely held firms. These results are consistent with the conclusion of the recent studies such as Dittmar and Mahrt-Smith (2007) that the value of cash holdings is lower for firms with poor corporate governance. Our results also confirm the assertion of Pinkowitz *et al.* (2006) that, the value of cash declines over time because the coefficients of  $dCASH_{t+2}$  are lower than  $dCASH_t$ . These findings imply that when firms accumulate more cash than required the impact of extra dollar in cash holdings on firms' market valuation is negative. Indeed, Gao (2011) argues that if investors know that the firms have enough cash holdings, i.e. they not need to issue more shares, for investment, any attempt to do so might send a signal of overvaluation. We find that the negative impact on market valuation is higher for widely held compared to closely held firms in Australian equity market.

#### 4.5 Robustness check

It is plausible that analysis in Section 4.3 may suffer from the simultaneity problem, which arise when one or more of the independent variables are jointly determined with dependent variable through an equilibrium mechanism. In our case, it is likely that the relationship between ownership, cash holdings and firm value is driven by the correlation of the variables with other firm characteristics which might be observable and unobservable. As a solution to this issue, the model of Denis and Sibilkov (2009) controls the endogeneity of cash holdings by solving the investment equation and cash equation simultaneously. Therefore, we also adopted a simultaneous equation approach[8] to address this problem:

$$\begin{aligned} CASH_{i,t} = & \alpha_{1,0} + \beta_{1,1}q\_ratio_{i,t} + \beta_{1,2}OWN_{i,t} + \beta_{1,3}CRG_t + \beta_{1,4}RD_{i,t} \\ & + \beta_{1,5}DIV_{i,t} + \beta_{1,6}CAP_{i,t} + \beta_{1,7}DEBT_{i,t} + \beta_{1,8}SIZE_{i,t} + Ind + v_{i,t}, \end{aligned} \quad (3a)$$

$$\begin{aligned} OWN_{i,t} = & \alpha_{2,0} + \beta_{2,1}CASH_{i,t} + \beta_{2,2}q\_ratio_{i,t} + \beta_{2,3}CRG_t + \beta_{2,4}RD_{i,t} + \beta_{2,5}DIV_{i,t} \\ & + \beta_{2,6}CAP_{i,t} + \beta_{2,7}DEBT_{i,t} + \beta_{2,8}SIZE_{i,t} + Ind + v_{i,t}, \end{aligned} \quad (3b)$$



$$q\_ratio_{i,t} = \alpha_{3,0} + \beta_{3,1}CASH_{i,t} + \beta_{3,2}OWN_{i,t} + \beta_{3,3}CRG_t + \beta_{3,4}RD_{i,t} + \beta_{3,5}DIV_{i,t} + \beta_{3,6}CAP_{i,t} + \beta_{3,7}DEBT_{i,t} + \beta_{3,8}SIZE_{i,t} + Ind + v_{i,t}, \quad (3c)$$

Table V reports the estimation results using equations 3(a)-(c). The results for the dependent variable *CASH*, *OWN* and *q\_ratio* are summarized as follows[9]. With reference to cash holdings, we find that both *OWN* and *q\_ratio* are positively related to firms' *CASH*. For ownership, while *CASH* has a positive relationship with *OWN* but

	<i>CASH</i>	Dependent variable <i>OWN</i>	<i>q_ratio</i>
Constant	3.7448* (1.4002)	0.4020* (0.0162)	2.7924* (0.1537)
<i>q_ratio</i>	0.1024* (0.0099)	-0.0005** (0.0002)	-
<i>CASH</i>	-	-0.0051** (0.0021)	0.0022*** (0.0013)
<i>OWN</i>	0.2024* (0.0346)	-	-0.4913* (0.1786)
<i>CRG</i>	0.0155** (0.0015)	0.0201 (0.0128)	0.2503** (0.1151)
<i>RD</i>	0.6622* (0.1323)	-0.0233 (0.0061)	0.6834* (0.0543)
<i>DIV</i>	-0.4460 (1.3324)	0.2441* (0.0557)	4.5774* (0.4901)
<i>CAP</i>	0.7017* (0.2182)	0.0031 (0.0027)	0.0407*** (0.0251)
<i>DEBT</i>	0.2672* (0.0217)	0.0294*** (0.0130)	0.8270* (0.1169)
<i>SIZE</i>	0.4363* (0.1772)	0.0067* (0.0022)	0.2082* (0.0202)
Adj. <i>R</i> <sup>2</sup>	0.2122	0.0950	0.1072
<i>F</i> -test	9.1396*	5.2410*	10.2241*

**Notes:** Statistical significance at: \*, \*\*5 and \*\*\*10 percent levels; this table reports the simultaneous estimation results using the equations below:

$$CASH_{i,t} = \alpha_{1,0} + \beta_{1,1}q\_ratio_{i,t} + \beta_{1,2}OWN_{i,t} + \beta_{1,3}CRG_t + \beta_{1,4}RD_{i,t} + \beta_{1,5}DIV_{i,t} + \beta_{1,6}CAP_{i,t} + \beta_{1,7}DEBT_{i,t} + \beta_{1,8}SIZE_{i,t} + Ind + v_{i,t}, \quad (3a)$$

$$OWN_{i,t} = \alpha_{2,0} + \beta_{2,1}CASH_{i,t} + \beta_{2,2}q\_ratio_{i,t} + \beta_{2,3}CRG_t + \beta_{2,4}RD_{i,t} + \beta_{2,5}DIV_{i,t} + \beta_{2,6}CAP_{i,t} + \beta_{2,7}DEBT_{i,t} + \beta_{2,8}SIZE_{i,t} + Ind + v_{i,t}, \quad (3b)$$

$$q\_ratio_{i,t} = \alpha_{3,0} + \beta_{3,1}CASH_{i,t} + \beta_{3,2}OWN_{i,t} + \beta_{3,3}CRG_t + \beta_{3,4}RD_{i,t} + \beta_{3,5}DIV_{i,t} + \beta_{3,6}CAP_{i,t} + \beta_{3,7}DEBT_{i,t} + \beta_{3,8}SIZE_{i,t} + Ind + v_{i,t}, \quad (3c)$$

the dependent variables are *q\_ratio* is the market value of equity plus book value of debt divided by total assets; *CASH* is total cash and cash equivalents divided by net assets, and *OWN* is the percentage of shares held by insiders in a firm *i* at time *t*; *CRG* is equal to 1 for the years 2004-2010 and 0 for the years 1995-2003; *RD* is research and development expenses divided by total net assets; *DIV* is total cash dividends; *CAP* is total capital expenditure divided by total net assets; *DEBT* is total debt to total assets ratio; *SIZE* is natural logarithm of total assets; we used a forward orthogonal deviations transformation and level variables dated *t* - 2 to *t* - 4 as instruments; *J*-test is a Sargan test statistic of over identifying restrictions related to instruments are valid; *m*<sub>1</sub> and *m*<sub>2</sub>, are the *p*-values of the LM *F*-test statistics values of first and second order serial correlation in the residuals; *F*-test statistic reports joint significance of the explanatory variables

**Table V.**  
Ownership, cash holding  
and firm value –  
simultaneous equation  
results

$q\_ratio$  has a negative relationship with  $OWN$ . Lastly, for the  $q$ -ratio, we find a significant positive relationship between  $CASH$  and  $q$ -ratio, and a significant negative relationship between  $OWN$  and  $q\_ratio$ .  $CRG$  has a significant positive influence on the  $CASH$  and  $q$ -ratio, respectively. These results provide further support to  $H1$ ,  $H2$  and  $H4$ . Among the control variables,  $DEBT$ ,  $CAP$  and  $SIZE$  have significant positive impact on the firms' cash holdings, ownership, and  $q$ -ratio as we expected.

## 5. Conclusion

This paper investigates the impact of firms' cash holdings and ownership concentration on the firms' value for a sample of non-financial listed firms in Australia. In particular, we examined whether ownership concentration affects a firm's value by curbing excessive cash holding. As we predicted, cash holding has a significant impact on the valuation of the firms after controlling for a firm's dividends, investment and financing decisions. Our results provide significant support for our conjecture that corporate ownership moderates the impact of cash on firm valuation. For closely held firms, with poor corporate governance practices, the cash holding have a negative impact on the valuation and vice versa. These results are consistent with managerial entrenchment hypothesis.

We conducted robustness checks by using alternative estimation approach to ensure that correct inferences are drawn. We find robust support of the entrenchment hypothesis and highlight its implication for a developed country. Widely owned firms in Australia have lower cash holdings because managers are able to access capital market easily compared to firms with concentrated ownership that have complex agency and information asymmetry problems. Indeed, Bates *et al.* (2009) and Denis and Sibilkov (2009) have shown that the US firms hold too much cash because of agency problems. Though our empirical findings are similar to those documented for the developed countries such as the US but these results also reveal that the ownership structure found in the listed non-financial firms in Australia contrast strongly with those found in the largest firms in the US. These results imply though high ownership concentration is an effective control device but it is not a driver of firm value maximization. As our results shows that, for firms with relatively high control-ownership structures, market discounts the extra AUD\$1 in cash holdings. Even in the long-run, when closely held firms accumulate more cash than required due to lack of access to capital markets and higher agency costs of equity, the impact of extra dollar on firm market valuation is negative. Our main contribution to the literature lies in a robust estimation of a positive relationship between cash holdings and firm value.

The separation of ownership and control between shareholders and managers in public corporation can play an important role in determining the level of pay to a firm's manager (Liu and Muar, 2011). A higher ownership concentration has important implications for the entrenched managers' remuneration. The structure of managerial remuneration is of critical importance to align managerial interests' with shareholders' interests. According to Tian and Twite (2011), executive compensation in Australia is not tied to stock performance like in the developed countries such as the USA and the UK. We argue that, in favour of shareholders' wealth maximization, an increase in the proportion of share options in the managerial compensation contract would be useful. Furthermore, employees can also control managerial opportunism if they are represented on the firm's board of directors. In this way, the private benefits of

control could be identified and reduced. Recent studies have shown that managerial entrenchment affect workers' pay and that corporate governance can be of importance for labour market outcomes such as worker's pay (Cronqvist *et al.*, 2009). Future research should examine the link between managerial entrenchment and worker's pay.

### Notes

1. The firms are required to comply with, or justify the instance of non-compliance with these practices from 2004 reporting year onwards.
2. Kusnadi and Wei (2011) also report that firms are likely to decrease their cash holdings in countries with strong legal protection of minority investors. They argue that the legal protection of investors represents the first-order effect in influencing international firms' cash management policies.
3. Opler *et al.* (1999) emphasize the existence of implicit target cash levels.
4. According to Australian Corporation Act, if a company acquires control of another company if it acquires more than 20 percent of the voting rights in another public listed company, or an unlisted company with more than 50 shareholders.
5. We use  $(\beta_1 + \beta_3 \times OWN)$  to calculate overall sensitivity, using the estimated coefficients values from Table III, we find that sensitivity is  $-0.3528$  at 10th percentile of *OWN* and it reaches to  $-19.1202$  at 50th percentile of *OWN*.
6. The model in equation (2) is a modified version of the actual valuation model used in Pinkowitz and Williams (2004). It is based on *ad hoc* approach not a sound theory (Bates *et al.*, 2009).
7. In a separate experiments, we also included lead and lag of the *OWN* variable in the model in equation (2) but none of the coefficient was significant.
8. We estimate this system using two-stage least square that require instrumental variables. We included at least as many instruments as we have endogenous variables.
9. We do not adjust the standard errors using Petersen's approach because it is not clear how his approach might apply to a system of simultaneous equation (Bhagat and Bolton, 2008).

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