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Corporate Governance in Australia: Share Repurchases under an Imputation Tax System

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Abstract: Research Question: Whether the mitigating effect of corporate governance on investor perceptions of corporate agency problems affects corporate financial dividend decisions is a question, especially under an imputation tax system. **Motivation:** Since 2003 Australian firms must comply with the Principle of Good Corporate Governance and Best Practice Recommendations by the Australian Securities Exchange. Moreover, since the imputation tax system in Australia substantially differs from other countries, a study investigating the effect of corporate governance on share repurchases in Australia is warranted. **Idea:** Hence, this paper examines the association between corporate governance and share repurchases in Australia given its unique taxation system for corporate dividend payments. More specifically, we examine the association between corporate governance and the choice of dividend strategies under Australia's imputation tax regime. We developed and tested three hypotheses: 1) better corporate governance is associated with greater ratio of share repurchase; 2) the ratio of share repurchase is positively associated with the payout ratio of cash dividends for firms that adopt a franked dividend regime; and 3) any positive association between the ratio of share repurchase with the payout ratio of cash dividends for firms that adopt a franked-dividend regime is evident only for firms with strong corporate governance. **Data:** We have a final sample of 1858 firm-year observations of which 250 (i.e., 13.5%) involve share repurchases for the 2004-2013 period. The sample companies are obtained from the constituents of the ASX 300, which contains the top 300 firms listed on the stock exchange in Australia (ASX). **Method/Tools:** We use Tobit regression method to estimate the models. **Findings:** Consistent with the literature, we find a positive association of share repurchases with better corporate governance, but contrary to the literature for the U.S. and Sweden, we find a positive association between share repurchases and cash distributions, which weakens with poorer corporate governance. **Contributions:** Our robust findings highlight the importance of country-specific institutional arrangements such as tax regimes when understanding corporate dividend strategies. Overall, we show that the mitigating effect of corporate governance on investor perceptions of corporate agency problems affects corporate financial dividend decisions.

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1. Introduction

During the past 30 years, share repurchases have become increasingly popular as a means of distributing corporate income to investors, especially in the U.S. To illustrate, the proportion of companies paying a dividend decreased from 66.5% in 1978 to 20.8% in 1999 (Fama and French, 2001). This palpable change in corporate dividend practice has preciptiated the examination of share repurchases for various countries, such as Taiwan (Wu, 2012); the U.S. (e.g., Grullon and Michaely, 2002; Skinner, 2008); Korea (Han *et al.*, 2014); and 15 European countries including the U.K., France and Germany (Von Eije and Megginson, 2008), Sweden (Jansson and Larsson-Olaison, 2010) and Spain (González and González, 2004).

Only a few studies that examine the association between corporate governance and corporate dividend policy focus on the important impact of country-specific tax regimes. Han *et al.* (2014) report that stock repurchases are likely to be false signals of undervaluation in Korea, and that the false signalling caused by agency costs can be mitigated by stronger corporate governance. Wu (2012) shows that better governance mechanisms can decrease managerial misconduct associated with share repurchases and can enhance the credibility of the financial decisions of managers in Taiwan. Jansson and Larsson-Olaison (2010) document that corporate governance directly affects stock repurchasing behaviour in Sweden.

Studies that examine the effect of the Australian full imputation tax regime on share repurchases largely focus on the perspective of corporate financial policy and corporate capital management, while ignoring governance issues. Brown and Norman (2010) found that the use of off-market share repurchases is higher for larger distributions and for firms with more cash or greater undervaluation. Other studies investigated the effect of taxes on off-market share repurchase behaviour (Brown and Efthim, 2005; Brown and Davis, 2012), and the effect of off-market share repurchase announcements on stock price and volume behaviour (Brown, 2007). Henry (2011) supports for the existence of tax-based dividend clienteles in Australia based on the tax-based preferences of five share ownership categories.

Thus, our paper examines the association between corporate governance and share repurchases in Australia given its unique taxation system for corporate dividend payments.[1] Our study differs from the examination of Australian share repurchases from a governance perspective by Yarram (2014). We not only expand the governance elements considered but we are the first to show that the commonly reported negative (i.e., substitution) impact of cash distributions on share repurchases can be positive (i.e., complementary) in an economy that allows for the corporate choice of a full imputation tax regime. Also, to the best of our knowledge, we are the first to show that not only is there a positive (not negative) association between share repurchases and cash distributions, but that the association weakens with poorer corporate governance.

Our paper makes a three-fold contribution to the literature. First, we demonstrate the impact of the removal of double taxation on the corporate use of cash distributions and share repurchases as a means of distributing corporate income to shareholders. Second, we show that the mitigating effect of corporate governance on investor perceptions of corporate agency problems affects corporate financial dividend decisions. Third, our study examines a unique sample of firms with diverse corporate governance regimes where only a majority of firms have chosen to adopt a franked dividend regime (i.e., full imputation tax), which can essentially eliminate "double-taxation" of corporate distributions to shareholders.

[1] Although the terms 'share buyback' and 'share repurchase' are generally used for Australian and U.S. firms, respectively, we use the terms interchangeable in this paper.

The remainder of this paper is organized as follows. Section 2 discusses the share repurchase and full imputation tax regimes in Australia vis-à-vis other countries such as the U.S. Section 3 develops the empirical hypotheses based on the existing theories, empirical findings and the Australian business context with special attention placed on the effect of the full imputation tax on corporate dividend strategies. Section 4 reviews the methodology, and data used in our empirical tests. Section 5 presents and discusses the empirical results. Section 6 documents the findings of various tests of robustness. Section 7 concludes.

2. Share Repurchases and Full Imputation Tax Regimes in Australia

First introduced in Australia in November 1989, share repurchases have become more frequent after the December 1995 revision of the Corporate Law Simplification Act No. 115 (1995), which governs share repurchases. Listed companies can purchase shares on- or off-market (Mitchell and Dharmawan, 2007).[2] Australian ASX300 firms in our sample repurchased more than 61 billion AUD in share value over the 2004-2012 period.[3]

Unlike the U.S., Australia mandates a share repurchase to be officially declared with the number of shares, and the deal closed not more than six months after the declaration. The repurchased shares must be cancelled immediately and cannot be held as treasury stock and re-issued at a later date or used for employee stock options. In contrast, a share repurchase is an option in the U.S. (Stephens and Weisbach, 1998; Oded, 2005), and it is not necessary for firms to declare their repurchase (Netter and Mitchell, 1989). For these reasons, Dharmawan and Mitchell (2001) claim that the Australian repurchase system is more transparent than that of the U.S. (and the U.K.).

In addition to these design differences, the Australian tax regime on corporate dividends differs substantially from that of the U.S. although both countries share the Anglo-American governance system. The general belief is that the taxation system can affect corporate decisions (e.g., Graham, 2013). Share repurchases may be preferred over cash dividends by investors due to the relative tax advantage of capital gains (Dittmar, 2000) since the rate is usually lower for capital gains than for dividends, and the payment of capital-gains taxes can be delayed by not selling the shares. To illustrate, share repurchases decreased after the U.S. capital gains tax increased in 1986 (Dittmar, 2000). Theoretical models predict that taxes induce clientele effects in the asset holdings of investors and that multiple tax rates affect relative asset prices (e.g., Auerbach and King, 1983; Dybvig and Ross, 1986; Dammon and Green, 1987; Allen *et al.*, 2000). Empirical support for the dividend-clientele theory include Elton and Gruber (1968; 1970) for the U.S.; Dahlquist *et al.* (2014) for Sweden; and Henry (2011) for Australia.

Unlike the U.S., Australia has operated since 1987 under the franked dividend system (i.e., the full imputation tax system) that essentially eliminates "double-taxation" of corporate distributions to shareholders if such a choice is made by a company.[4] shareholders (in a franking option company) gain franking tax credits for dividend income, which is equal to the tax that the company has already paid on 'franked' dividend payouts.

[2] The former are anonymous purchases on the stock exchange, while the later involves a company repurchasing from eligible shareholders their shares at a determined price (Brown and Norman, 2010). In addition to these on- and off-market repurchases, the Corporations Act (2001) allows share buybacks in the form of selective, employee share scheme, and odd-lot. Broadly speaking, a selective share buyback occurs when the buyback offers are only made to some of the shareholders in the company. An employee share scheme is where a company repurchases shares which are held by or for its salaried directors or employees.

[3] The total amount of the buyback by all Australian firms over the period was 85.6 billion AUD.

[4] Other countries with a full imputation system include Mexico, New Zealand, and Spain. Countries with a partial imputation company tax system include Canada, France, and the United Kingdom where firms pay tax on their profits but part of this tax paid is taken into account when shareholders calculate their income tax liability. Countries such as the U.S.A, Austria, Belgium, Denmark, Japan, and Portugal have a modified tax system where dividends are taxed at a lower rate than other types of income for investors.

3. Development of the Hypotheses

We develop three hypotheses based on the existing theories, empirical findings, and the Australian business context with special attention to the effect of the imputation tax on corporate dividend strategy. Our use of the term 'dividends' refers to cash distributions unless state otherwise.

3.1 Corporate Governance and Agency Conflicts

The ultimate goal of corporate governance is (minority) shareholder protection (Jensen and Meckling, 1976; Fama and Jensen, 1983; Shleifer and Vishny, 1997). Improved governance, other things being equal, should directly enhance shareholder wealth. The free cash flow hypothesis is based on the argument that entrenched managers tend to use free cash for their own benefits to the detriment of minority shareholders (Easterbrook, 1984; Jensen, 1986; Nohel and Tarhan, 1998). In the absence of profitable investment opportunities, managers may, for example, use cash for mergers and acquisitions to build business empires. Thus, good corporate governance should encourage managers to better utilize free cash flow by increasing dividends in order to minimize agency conflicts and to prevent misbehaviours.

Investor preferences for dividends are not neutral between cash distributions and share repurchases based on their different tax treatments. Similarly, corporations may prefer share repurchases over cash distributions due to the former's flexibility (Bajaj and Vijh, 1990; Kaplan and Reishus, 1990; Denis *et al.*, 1994; Brav *et al.*, 2005). This flexibility may allow managers to better time repurchases due to the availability of valuable investment opportunities or stock mis-valuations (Brav *et al.*, 2005). In contrast to cash distributions (Lintner, 1956; Skinner, 2008), share repurchases do not foster an ongoing expectation among investors (Dittmar, 2000. As implied by the theory of asymmetric information, share repurchases may be a corporate strategy to reduce share undervaluation by increasing demand for a firm's shares (Stephens and Weisbach, 1998). According to the signalling hypothesis, managers of undervalued firms can signal their ability to generate higher future earnings by using share repurchases (Bhattacharya, 1979; Miller and Rock, 1985). Consistent with Miller and Rock (1985), stock repurchases can be used to defend against take-over attempts by reducing the number of shares available to corporate raiders, as happened in the U.S. during the mid-1980s (Bagwell, 1991; Chang and Sullivan, 2007; Xue and Billett, 2007).[5] Jansson and Larsson-Olaison (2010) document that governance positively influences the premium paid in private stock repurchases in Sweden. Wu (2012) demonstrates that better governance leads to more stock repurchase completions in Taiwan.[6] And, governance variables such as larger board size (Zahra and Pearce, 1989), board independence (Davidson *et al.*, 1998; Yarram, 2014), and CEO duality (Patton and Baker, 1987) affect positively the price of share repurchases. Thus, our first hypothesis is:

H_1: Better corporate governance is associated with a greater ratio of share repurchases.

3.2 Tax Effects Associated with the Franked Dividend System[7]

As stated earlier, two important goals of dividend policy are to prevent agency conflicts and to increase the wealth of shareholders. Share repurchases and cash distributions are substitutes for addressing internal agency problems, which comports with the negative association of

[5] If a firm pays premium (Harris and Glegg, 2009), share repurchasing decreases the shareholder wealth of the remaining shareholders who do not sell their shares, given cross-subsidies among shareholders. However, Brown and Efthim (2005) indicate firms usually pay a discount in Australia (see also footnote 7).

[6] Wu (2012) associated corporate governance with the completion of repurchase. In contrast, our study examines the value of share repurchase (scaled by asset). In Australia, the completion of repurchase is not a concern because all announced repurchases should be implemented. In addition, our paper focuses on the effect of governance on repurchase in the nexus of the imputation tax.

[7] Franked refers to the payment of dividends from after-tax corporate income.

cash distributions with share repurchases in the U.S. (Dittmar, 2000; Grullon and Michaely, 2002; Skinner, 2008), and in Sweden (Jansson and Larsson-Olaison, 2010).

We propose that the association between cash distributions and share repurchases need not be negative in an economy with a full imputation tax system. Australia's imputation tax (or franked dividend) system makes its dividend policy environment different from other nations under the Anglo-American governance system such as the U.S. The franked dividend system in Australia provides shareholder tax credits for cash dividends paid out of after-tax corporate earnings. While not a legal requirement, approximately 60 percent of our firm-year sample observations are for franked dividends.

Here is an illustrating example of the after-tax income for two Australian investors from a $100 cash or stock repurchase dividend. Investor A (B) is a shareholder of a firm that (has not) adopted a franked dividend distribution system. Assume that both investors have a marginal income tax rate equal to the Australian corporate tax rate of 30%, and that capital gains are taxed at one-half of the marginal rate (15%).[8] While the after-tax incomes are identical at $85 [i.e., $100*(1-0.15)] for both investors with a $100 share repurchase, they are $100 and $70 for investor A and B, respectively, with a $100 cash distribution.[9] Thus, based solely on the higher (lower) after-tax income for the investor A (B) from the $100 dividend distribution by the firms, investor A would prefer the cash distribution (investor B would prefer the share repurchase).[10]

This case for the difference in net income to shareholders between cash distribution and repurchase under the imputation tax system, combined with the dividend clientele theory (Elton and Gruber, 1970; Bajaj and Vijh, 1990; Dahlquist *et al*., 2014), suggests that the franked dividends are now tax-preferred but the share repurchases offer firms more flexibility. That is, it is less costly in terms of 'signaling' to terminate a share repurchase program than it is to cut a cash dividend. Contrary to an investor's perception of cash dividend, share repurchase does not give a signal to the market that the firm will continue the repurchase. As a result, firms will want to offer a mix of payouts to satisfy tax-sensitive shareholders but still retain some flexibility in terms of adjusting payouts.

H_2: The ratio of share repurchase is positively associated with the payout ratio of cash dividends for firms that adopt a franked-dividend regime.

Of the studies that document the impact of the Australian imputation tax system on corporate financial policies,[11] only a few investigate share repurchases. Aharoni *et al.* (2011) reported that Australian companies prefer repurchasing shares for cash distribution. While Yarram (2014) analysed share repurchases from a corporate governance perspective restricted to a few governance elements, he did not investigate the impact of the franked dividend regime on the relation between cash distributions and share repurchases. Adjaoud and Ben-Amar (2010) found that firms with stronger corporate governance that are listed on the Toronto Stock Exchange from 2002 to 2005 have higher dividend payouts. This indicates that the level of corporate governance would influence the positive association between share repurchases and the cash dividends payout ratio. Thus, our third hypothesis is:

H_3: Any positive association between the ratio of share repurchase with the payout ratio of cash dividends for firms that adopt a franked-dividend regime is evident only for firms with strong corporate governance.

[8] A person who has the highest marginal income tax rate of 45 percent needs to pay a tax for the additional 15 percent. A person with a marginal tax rate below 30 percent would have cash returned from the government.

[9] Equal to [$100*(1-0.3) + $30] and [$100*(1-0.3)], respectively.

[10] Tax consequences of on- and off-market share repurchases differ.

[11] Other studies include: Mitchell, Izan and Lim (2006); Brown (2007); Mitchell and Dharmawan (2007); Doan *et al.* (2011); and Brown and Davis (2012).

4. Methodology, Sample and Data

4.1 Model

The corporate decision to undertake a share repurchase can be conceptualized as a Kuhn-Tucker optimization solution given a set of constraints. Since the optimization procedure allows some firms to concentrate only on cash distributions, we use the Tobit estimation method. Our baseline model for the panel Tobit estimations to test the first hypotheses is:[12]

$$ShareRepurchase_{it} = \alpha_t + \beta_1 Govern_{it} + \sum_{k=1}^{K} \gamma_{kit} Control_{kit} + \varepsilon_{it} \quad (1)$$

where $ShareRepurchase_{it}$ is share repurchases in dollars divided by total assets. $Govern_{it}$ is a corpoarte governance index (CGI) with a normalized value between zero and one. The index consists of thirteen binary elements where one indicates that the governance condition for that element is satisfied (similar to Gompers *et al.*, 2003). As described in more detail in Appendix A, the elements in CGI cover board functions including managerial ownership, audit function, presence of a nomination committee and a remuneration committee.

$Control_{kit}$ is the control variable *k* for firm *i* in period *t*. The observed control variables include firm size (*Firm size*), relative cash balance (*RelCashBal*), undervaluation (*Undervaluation*), investment (*Investment*), growth opportunities (*Growth opportunities*), and leverage (*Leverage*).

Firm size, proxied by log of total assets, is frequently used as a control variable. This variable can capture an increase in the overall capacity of a firm to implement a share repurchase with increasing firm size (Ikenberry, 1995; Grullon and Michaely, 2002; Chang and Sullivan, 2007; Mitchell and Dharmawan, 2007; Jun and Jung, 2009); and a tendency of firms to use more heterogeneous dividend strategies as their shareholder base (dividend clienteles) becomes more heterogeneous with increasing firm size. This variable can capture an effect from increasing firm size on repurchase strategies due to a decrease in asymmetric information from an increase in analyst coverage (Dittmar, 2000), and the greater difficulty of managers to manipulate their boards (Zahra and Pearce, 1989). The expected sign of the estimated coefficient of firm size can only be determined empirically since the overall capacity argument and the dividend clientele effect imply a positive coefficient, while the asymmetric information and undervaluation arguments imply a negative coefficient.

RelCashBal (cash over total assets) controls for the free cash flows available to entrenched managers (Easterbrook, 1984; Jensen, 1986; Stephens and Weisbach, 1998; Dittmar, 2000; Guay and Harford, 2000; Jagannathan *et al.*, 2000) which is confirmed in Australia (Brown and Norman, 2010). Ceteris paribus, a high cash balance implies that a firm is in a better position to increase dividends which include share repurchases. Thus, the coefficient for *RelCashBal* is expected to be positive.

Undervaluation, as proxied by higher values of EBIT divided by share price,[13] captures any tendency of managers to use a share repurchase or higher cash dividend to signal whether they are able to generate higher future earnings (Bhattacharya, 1979; John and Williams, 1985; Miller and Rock, 1985) or to move share prices closer to their fundamental values. Undervaluation has been identified as one of the main motivations for Australian share repurchases (Otchere and Ross, 2002; Mitchell and Dharmawan, 2007; Brown and Norman, 2010).

Investment, captured by property, plant and equipment (PPE) over total assets, is expected to have a negative sign due to its competition with dividends for the use of cash.

[12] Please see Appendix B for a description of all the variables used in this paper.

[13] This variable also measures relative profitability. Ceteris paribus, share repurchases should increase with higher relative profitability if the value of cash is related to relative profitability.

Growth opportunities, measured as market capitalization over corporate book value, is also expected to capture firm under-valuation (e.g., Barberis and Huang, 2001; Daniel *et al.*, 2001). The numerator can indicate mispricing, risk, and differences in unconditional expected cash flows (or scale), while book values can help to filter out irrelevant scale differences.

Leverage, as measured by the total liabilities to total equity ratio divided by the average ratio for the firm's industry (Bowen *et al.*, 1982; Bradley *et al.*, 1984), is expected to have a negative sign (Ofer and Thakor, 1987; Wansley *et al.*, 1989; Dittmar, 2000). This is based on the finding that firms repurchase shares to be closer to their optimum leverage ratios or when no dominant controlling shareholders exist (Ofer and Thakor, 1987; Mitchell and Dharmawan, 2007; Jansson and Larsson-Olaison 2010).

We also control for a set of unobserved fixed effects to minimise the endogeneity bias associated with missing variables. These include firm-fixed effects to control for time-invariant variables (e.g., corporate culture) that are considered as a part of the residuals; one-digit level of industry fixed effects; and year effects to control for changes in macro-economic conditions and business cycle effects affecting cross-sectional firm homogeneity. Year-industry fixed effects are included in the estimations to control for dynamic industry fixed effects. For example, firms rely more on international business and international investors which is affected by movements of exchange rates.

To test the second and the third hypothesis, we use the following equation:

$$ShareRepurchase_{it} = \alpha_t + \beta_1 Govern_{it} + \delta_1 CashDistPayout_{it} + \delta_2 Govern_{it} \text{ x } CashDistPayout_{it} + \sum_{k=1}^{K} \gamma_{kit} Control_{kit} + \varepsilon_{it} \quad (2)$$

where $CashDistPayout_{it}$ is net profits paid out as cash dividends divided by net profits, with all other variables as previously defined. In estimation, we will run equation (2) for two sub-groups: firms with a franked dividend and firms without. Hypotheses 2 and 3 suggest a positive sign for the estimated coefficients, δ_1 and δ_2, respectively. $\delta_2 Govern_{it}$ x $CashDistPayout_{it}$ is the interaction term between governance and cash distribution payout.

4.2 Sample and Data

Since share repurchases are concentrated in large firms in Australia, we obtain our sample for the 2004-2013 period from the constituents of the ASX 300, which contains the top 300 firms listed on the stock exchange in Australia (ASX). The year 2004 is the first year when Australian firms adopted the Principles of Good Corporate Governance and Best Practice Recommendations (ASX Corporate Governance Council, 2003). As is customary in finance research, we exclude financial and utility firms because of the different compositions of their financial statements and their regulatory nature. We obtained a final sample of 1858 firm-year observations of which 250 (i.e., 13.5%) involve share repurchases. Both tails of the data are winsorized at the 2.5 percent level to minimise the effects of outliers. The data for the components of the governance index are collected from the Australian Announcements database of SIRCA; data (on market) share buybacks are collected from a DataStream database. Studies investigating Australian open market (i.e., on-market) repurchases report that on-market repurchase is commonly used by firms to signal their undervaluation and lower agency costs (Mitchell and Dharmawan, 2007).[14] Historical financial data are obtained from Morningstar DatAnalysis Premium (previously AspectHuntley FinAnalysis).

Table 1 reports the summary statistics. The mean (median) value of share repurchases in dollars to total assets as a percentage during the sample period is 0.217 (0.000) with a standard

[14] Though distribution of franking credits is not a default option for off-market repurchases, one of the main reasons for the off-market repurchases is to distribute the franked dividend (Brown and Norman, 2010).

deviation of 0.848. The mean value of CGI is 0.761 which is slightly smaller than the median value of 0.846, indicating that the distribution has a somewhat long left-tail. The mean (median) value of board independence, proxied by the ratio of outside directors to all board members, is 0.76 (0.80). This is somewhat higher than the 0.66 for the boards of all US firms, and 0.72 for Standard & Poor's boards. The earning-to-book ratios range between -0.33 and 0.177 and the cash distribution ratios range between 0.00 and 0.995.

Table 1: Summary statistics

Variables	Mean	Std. Dev.	Median	Min	Max
Dependent variable					
ShareRepurchase	0.217	0.848	0.000	0.000	4.477
Governance variables					
Govern	0.761	0.194	0.846	0.076	1.000
Govern (except Managerial ownership)	0.763	0.206	0.818	0.000	1.000
Managerial ownership (Index)	0.752	0.324	1.000	0.000	1.000
CEO ownership	4.394	3.084	4.561	0.000	10.435
Directors' ex. CEO ownership	4.354	2.732	4.344	0.000	9.421
Managerial ownership (Directors and CEO)	3.672	2.484	3.356	0.000	8.791
Board independence	0.760	0.152	0.800	0.000	1.000
Audit committee size	3.420	1.305	3.000	0.000	6.000
Audit committee meeting	3.822	2.095	4.000	0.000	9.000
Nomination committee size	2.480	2.317	3.000	0.000	8.000
Nomination committee meeting	1.875	2.059	1.000	0.000	7.000
Remuneration committee meeting	2.941	2.240	3.000	0.000	8.000
Firm characteristics					
Firm size	20.25	1.950	20.410	12.250	25.720
RelCashBal	0.138	0.168	0.067	0.000	0.702
Undervaluation	0.037	0.091	0.055	-0.330	0.177
Investment	0.285	0.232	0.242	0.001	0.785
Growth opportunities	3.032	2.701	2.115	0.260	12.500
CashDistPayout	0.265	0.251	0.240	0.000	0.995
Leverage	0.945	0.768	0.795	0.025	3.406

Notes: This table reports the summary statistics of the variables from 2004 through 2013. *ShareRepurchase* is the ratio of share repurchases to total assets. *Govern* is calculated as the summation of the thirteen categories of corporate governance dummies, as described in Appendix A, divided by thirteen, with better governance as the index approaches one. *Govern (except managerial ownership)* is CGI excluding managerial ownership. *Managerial ownership* is CGI based only on the managerial ownership data. *CEO ownership* is the natural log of shares held by the CEO divided by shares outstanding. *Directors' ex. CEO ownership* is the natural log of shares held by directors (excluding the CEO) divided by shares outstanding. *Managerial ownership (Directors and CEO)* is the natural log of shares held by all the directors (including the CEO) divided by shares outstanding. *Board independence* is the proportion of outside directors to the total number of directors. *Audit committee size* is the number of members on this committee. *Audit committee meeting* is the annual number of meetings held by the committee. *Nomination committee size* is the number of members on this committee. *Nomination committee meeting* is the number of meetings held by this committee during the year. *Remuneration committee meeting* is the annual number of meetings held by this committee. *Firm size* is the natural log of assets. *Relative cash balance* is cash divided by total assets. *Undervaluation* is the reciprocal of price earnings ratio. *Investment* is property, plant and equipment (PPE) divided by total assets. *Growth opportunities* is the market value of equity divided by book value of equity. *CashDistPayout* is the percentage of net profits paid out as cash dividends. *Leverage* is total liabilities divided by total equity. Number of observations is 1858 for all the variables.

A Pearson correlation matrix for the share repurchase and major selected covariates are reported in Table 2. We observe that, on average, better governance scores are positively correlated with cash distributions and share repurchases, which preliminarily supports Hypothesis 1. Except for the correlation between governance and firm size, all correlations are less than 0.5, which sugggest that multicollinearity is not a concern.

Table 2: Pearson cross-correlation matrix

Variables	ShareRep-urchses	Govern	Firm size	RelCash-Bal	Under-valuation	Investme-nt	Growth opportun-ities	Leverage
Govern	0.14***							
Firm size	0.20***	0.61***						
RelCashBal	-0.02	-0.35***	-0.46***					
Undervaluation	0.06***	0.29***	0.36***	-0.26***				
Investment	0.06***	0.22***	0.35***	-0.28***	0.06***			
Growth opportunities	0.24***	-0.18***	0.40***	-0.08***	0.07***	0.20***		
Leverage	0.04*	0.26***	0.35***	-0.30***	0.16***	0.21***	0.07***	
CashDistPayout	0.08***	0.27***	0.27***	-0.20***	0.32***	-0.07***	0.02	0.15***

Notes: This table reports the correlations among the dependent, independent and control variables. See Table 1 for variable definitions. *, **, *** refer to p<0.1, p<0.05 and p<0.01, respectively. Only the correlation between governance and firm size exceeds 0.5.

Figure 1 depicts the time-series behavior of CGI, and the portions of firms with share repurchases and cash distributions over the sample period. The average governance scores have increased by 10 percentage points from 70.58 percent in 2004 to 82.93 percent in 2013. The portion of share repurchases has also increased, which is consistent with Hypothesis 1. Although the portion of cash distributions has also increased from 6.9 percent in 2004 to 16.1 percent in 2013, the trend has remained stable between 2007 and 2011. The rising trends for both cash distributions and share repurchases preliminarily support Hypothesis 2. Figure 1 also indicates that 70.61 percent of the Australian firms in our sample had cash distributions, which is approximately 57.16 percentage points higher than that for share repurchases. This suggests that cash dividend policy is an important strategic decision for Australian firms.

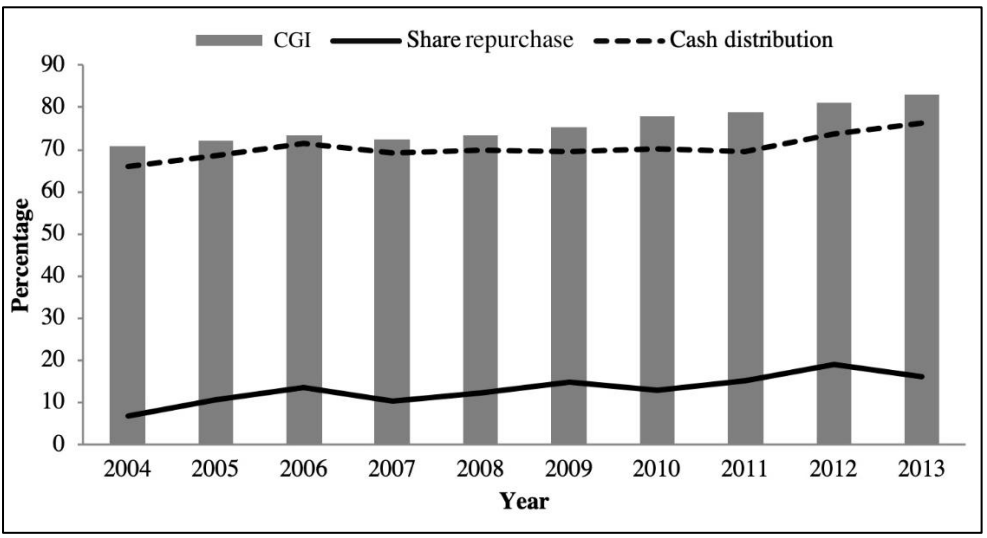

Figure 1: Time-series behaviour of CGI, and the percentages of firms with share repurchases and cash distributions over the 2004-2013 period

5. Empirical results

5.1 Test of the First Hypothesis

We begin by testing the first hypothesis that: Better corporate governance is associated with greater ratio of share repurchase. Table 3 reports these regression results from testing Hypothesis One. In addition to the typically used control variables, we control for various unobservable fixed effects which include year effects, firm effects, industry effects and year-

industry effects. The coefficient of *Govern* is significantly positive for all model specifications, which supports the first hypothesis.

Table 3: Relationship between ratio of share repurchase and firm governance

	1	2	3	4	5	6	7
Govern	0.09***	0.09***	0.04***	0.05***	0.03***	0.04***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Firm size			0.01***	0.01***	0.01***	0.01***	0.01***
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RelCashBal		0.00	0.02	0.02	0.02**	0.02	0.02
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Undervaluation			0.05**	0.05**	0.04**	0.05**	0.05**
			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Investment			-0.01	-0.01	0.01	0.00	0.01
			(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Growth opportunities			0.00***	0.00***	0.00***	0.00***	0.00***
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage			-0.01***	-0.01***	-0.00***	-0.01***	-0.01***
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.11***	-0.11***	-0.32***	-1.59	-0.30***	-1.48	-18.62
	(0.01)	(0.01)	(0.04)	(1.24)	(0.02)	(1.23)	(0.00)
Year effect	No	No	No	Yes	No	Yes	Yes
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	No	No	No	No	Yes	Yes	Yes
Year-industry effect	No	No	No	No	No	No	Yes
N (firm-year)	1858	1858	1846	1846	1846	1846	1846
N (firm)	209	209	209	209	209	209	209
Log likelihood	103.32	103.76	259.16	264.63	212.71	273.99	320.08

Notes: The panel Tobit method is used to estimate Equation (1) for explaining share repurchases in dollars divided by total assets. Standard errors are reported in the parentheses. *, **, *** refer to $p<0.10$, $p<0.05$ and $p<0.01$, respectively.

Figure 2 shows the time-series behavior of CGI, and the portions of firms with share repurchases and cash distributions over the 2004-2013 period by industry. Unlike the mean CGI scores, the mean of firms that paid cash distributions varies substantially across industries.

Regarding the control variables, the estimated coefficient of *Firm size* is positive and significant which comports with Jagannathan *et al.* (2000); Fenn and Liang (2001); Grullon and Michaely (2002); and Mitchell and Dharmawan (2007). This finding suggests that the positive overall capacity and dividend clientele effects captured by firm size more than offset the negative asymmetric information and undervaluation effects on the ratio of share repurchase captured by firm size.

The coefficient of *RelCashBal* is positive but only statistically significant in run (5). This finding suggests that cash balances have little power in explaining the ratio of share repurchase after accounting for the level of governance of the firm. The coefficient of *Undervaluation* is consistently positive and significant. Thus, the ratio of share repurchase increases with increasing undervaluation.

The estimated coefficient of *Investment* is consistently negative but not statistically significant. The estimated coefficient of *Growth opportunities* is consistently positive and statistically significant. Thus, as expected, the ratio of share repurchase increases with increasing growth opportunities. The coefficient of *Leverage* is significantly negative. Thus, as expected and consistent with the literature (Mitchell and Dharmawan, 2007; Wu, 2012), the ratio of share repurchase decreases with increasing leverage.

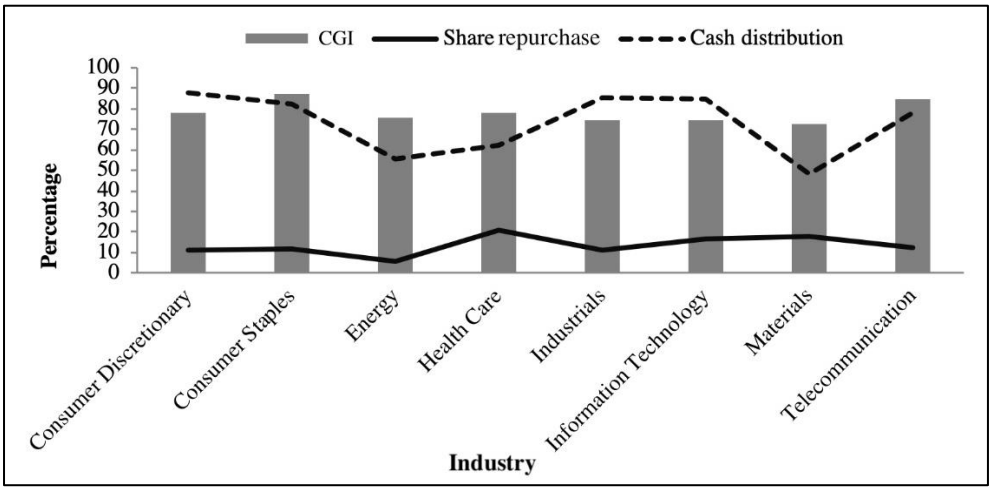

Figure 2: Cross-sectional behaviour of CGI, and the percentages of firms with share repurchases and cash distributions by industry

Notes: *Govern* is calculated as the summation of the thirteen categories of corporate governance dummies, as described in Appendix A, divided by thirteen. As such, the closer the index is to 1, the better the corporate governance, and vice versa. Share repurchase is the percentage of firms with a share repurchase. Cash distribution is the percentage of firms with a cash dividend.

5.2 Test of the Second Hypothesis

To test the second hypothesis that the ratio of share repurchase is positively associated with the payout ratio of cash dividends for firms that adopt a franked-dividend regime, we add *CashDistPayout* to model (1).[15] The only new result in Table 4 compared to Table 3 is that the ratio of share repurchase is positively and significantly associated with *CashDistPayout*.[16] This result supports Hyposthesis Two but differs from the negative association reported in the U.S. and Sweden between share repurchases and cash distributions. We attribute this difference primarily to the full imputation tax system in Australia where cash distributions and share repurchases are not competing dividend strategies.

5.3 Test of the Third Hypothesis

To test Hypothesis Three that poorer firm governance mitigates the positive association of the payout ratios of cash distributions on the ratio of share repurchase, we construct three dummy variables for the level of governance. The first dummy variable equals one if CGI for the firm is higher than the median value for all other firms for that period and equals zero otherwise. The second (third) dummy variable equals one if the firm's level of corporate governance falls into the highest (lowest) governance quartile for that period, equals zero otherwise.

[15] Under the franked dividend system, a firm pays tax on behalf of shareholders for their dividend income. For example, firms will pay tax up to 30 percent for shareholders if firms adopt fully franked dividend. In contrast, firms will pay a tax less than 30 percent if the firm adopts a partial franked dividend. One corner solution is not to adopt the franked dividend. For this reason, profitability and size of firms are important determinants of the adoption of the franked dividend. Further detailed study is beyond the objectives of this paper.

[16] We obtain qualitatively similar results for the unrestricted sample when the relative size of share repurchases is scaled by capital equity. The only exception is that the undervaluation variable becomes insignificant at conventional levels.

Table 4: Relationship between the ratio of share repurchase and firm governance, controlling for the payout ratio of cash distributions

	Unrestricted sample					Franked dividend firms only
	1	2	3	4	5	6
Govern	0.09***	0.05***	0.05***	0.04***	0.04***	0.05***
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
CashDistPayout	0.019***	0.019***	0.019***	0.019***	0.019***	0.022***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Firm size		0.01***	0.01***	0.01***	0.01***	0.01***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RelCashBal		0.02	0.02	0.02*	0.02	0.01
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Undervaluation		0.05**	0.05**	0.05**	0.05**	0.17***
		(0.03)	(0.02)	(0.02)	(0.02)	(0.05)
Investment		0.00	0.00	0.00	0.00	-0.00
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Growth opportunities		0.01***	0.01***	0.01***	0.01***	0.01***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage		-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.11***	-0.32***	-1.14	-0.35***	-1.01	-0.79
	(0.01)	(0.03)	(1.24)	(0.04)	(1.22)	(1.47)
Year effect	No	No	Yes	No	Yes	Yes
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	No	No	No	Yes	Yes	Yes
N (firm-year)	1858	1846	1846	1846	1846	1111
N (firm)	209	209	209	209	209	155
Log likelihood	108.14	266.69	271.44	276.17	280.85	189.75

Notes: The panel Tobit method is used to estimate Equation (1) with the addition of the cash distributions payout ratio for explaining share repurchases in dollars divided by total assets. The standard errors are reported in the parentheses. *, **, *** refer to p<0.1, p<0.05 and p<0.01, respectively.

The regression results are reported in Table 5. Based on Column (1) of Table 5, the coefficient of *CashDistPayout* is not significant at conventional levels while the coefficient of *CashDistPayout* x *GovDum_k=1* is not only significant but positive as expected. Thus, consistent with the third hypothesis, a positive association exists between the ratio of share repurchase and payout ratios of cash distributions only for firms with above-median CGI. To further examine the effect of the level of firm governance on the association between the ratio of share repurchase and payout ratios of cash distributions, we estimate the same model using the high quartile (Columns 2-5) and the low quartile dummies (Columns 6-9). We observe further supportive evidence based on the estimated coefficient of *CashDistPayout* x *GovDum_k=2* which indicates the incremental moderating effect of governance on the association between the ratio of share repurchase and payout ratios of cash distributions. The *incremental* moderating effect is not significant for firms in the best governance quartile and is significantly negative for firms in the worst governance quartile. The sum of the estimated coefficients for *CashDistPayout* and *CashDistPayout* x *GovDum* for k=1 and 2 remain positive within the range 0.01-0.02 and significant at conventional levels. In contrast, the estimated coefficients of *CashDistPayout* and CashDistPayout x GovDum_*k=3* are negative and insignificant. To summarize, the positive marginal effect of CashDistPayout on the ratio of share repurchase disappears with poor corporate governance, consistent with the predictions of agency theory and Hypothesis 3.

Table 5: The relationship between the ratio of share repurchase and firm governance, controlling for the payout ratio of cash distributions and the moderating effect of governance on the payout ratio of cash distributions

	GovDum_k=1	GovDum_k=2 (Best Governance Quartile)				GovDum_k=3 (Worst Governance Quartile)			
	1	2	3	4	5	6	7	8	9
Govern	0.07***	0.09***	0.05***	0.06***	0.03***	0.08***	0.03**	0.03**	0.03**
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
CashDistPayout	0.00	0.02***	0.03***	0.02***	0.01**	0.02***	0.02***	0.02***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
CashDistPayout *	0.02**	0.00	-0.01	-0.01	0.00	-0.04**	-0.03**	-0.03**	-0.03**
GovDum_k=	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Firm size			0.01***	0.01***	0.01***		0.01***	0.01***	0.01***
			(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)
RelCashBal			0.02	0.02	0.02***		0.02*	0.02	0.02*
			(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)
Undervaluation			0.05**	0.05**	0.03		0.05**	0.05**	0.05**
			(0.02)	(0.02)	(0.02)		(0.02)	(0.02)	(0.02)
Investment			0.00	-0.01	0.01		0.00	0.00	0.00
			(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)
Growth opportunities			0.00***	0.00***	0.00***		0.00***	0.00***	0.00***
			(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)
Leverage			-0.01***	-0.01***	-0.0***		-0.01***	-0.01***	-0.01***
			(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)
Constant	-0.10***	-0.1***	-0.30***	-1.09	-0.30***	-0.10***	-0.30***	-1.21	-0.30***
	(0.01)	(0.01)	(0.03)	(1.23)	(0.03)	(0.01)	(0.03)	(1.23)	(0.04)
Year effect	No	No	No	Yes	No	No	No	Yes	No
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	No	No	No	No	Yes	No	No	No	Yes
N (firm-year)	1858	1858	1846	1846	1846	1858	1846	1846	1846
N (firm)	209	209	209	209	209	209	209	209	209
Log likelihood	109.61	107.9	267.35	272.02	218.27	110.36	268.39	273.04	277.82

Notes: The panel Tobit method is used to estimate Equation (2) for explaining share repurchases in dollars divided by total assets. *GovDum_k*=1 is equal to one if CGI for the firm is above the median and 0 otherwise. *GovDum_k*=2 (*GovDum_k*=3) is equal to one if CGI for the firm is in the highest (lowest) quartile. The other variables are defined in Appendix B. The standard errors are reported in the parentheses. *, **, *** refer to p<0.1, p<0.05 and p<0.01, respectively.

We illustrate this effect in Figure 3 using the estimated coefficients for *Govern*, *CashDistPayout* and *CashDistPayout* x *GovDum_k=3* from Column (9) of Table 5 for firms belonging to the lowest *Govern* quartile, and untabulated estimates for firms not belonging to this quartile. Figure 3 focuses on the moderation effect of *Govern* when the levels of all included covariates are fixed and the constant is normalised to be zero. We observe an decrease (increase) in the ratio of share repurchase with an increase in *CashDistPayout* for firms belonging to the lowest quartile (other three quartiles) of *Govern*.

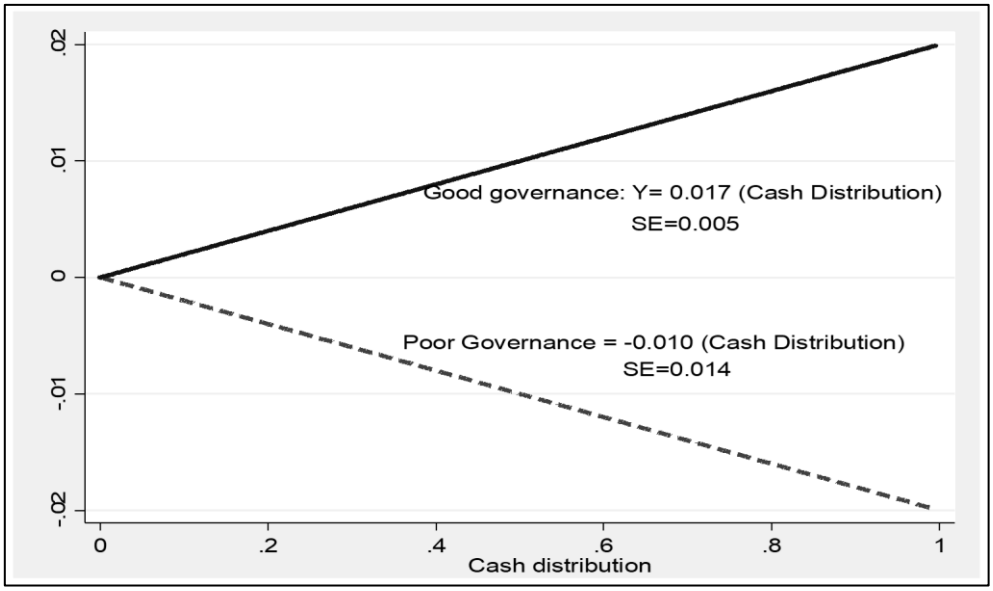

Figure 3: Cash distribution effect on share repurchases differentiated by good and poor governance

Notes: Poor governance consists of firms belonging to the lowest quartile of the distribution of CGI. The rest are classified as firms with good governance. *Cash distribution* denotes the payout ratio of cash dividends from EBIT. SE refers to the standard error. The SE for poor governance is calculated by, $\left[var\left(\hat{\beta}_{CashDistPayout}\right) + 2 \times 1 \times cov\left(\hat{\beta}_{CashDistPayout}, \hat{\beta}_{Govern}\right) + 1^2 \times var\left(\hat{\beta}_{Govern}\right)\right]^{0.5}$ where $\hat{\beta}_{CashDistPayout}$ and $\hat{\beta}_{Govern}$ refer to the estimated coefficients of the variables *CashDistPayout* and *Govern*, respectively. SE for good governance is calculated using the same method with zero replacing unity in the above formula.

6. Robustness tests

For robustness checks, we estimate the augmented model (2) using individual elements of CGI, a different measure of share repurchases, the interaction of leverage with the level of governance, removal of observations during the Global Financial Crisis (GFC), and the use of different estimation specifications to deal with endogeneity.

6.1 Individual Elements of Corporate Governance Index

Instead of using CGI, we estimate the same model using the individual elements of this index. Based on Table 6 and consistent with expectations, the ratio of share repurchase is positively and significantly associated with board independence (Yarram, 2014), audit committee size and meetings,[17] nomination committee size and meetings, and remuneration for committee

[17] An audit committee plays an important role in monitoring a company's financial reporting by ensuring that investors are informed and confident when making their investment decisions (Lipton and Lorsch, 1992; Kalbers and Fogarty, 1993; Blue Ribbon Committee on improving the effectiveness of corporate audit committees, 1999). Previous studies on governance practices report that one of the most common problems faced by directors is not having enought time to carry out their tasks and that audit committees should be diligent in conducting their duties

meetings; and is negatively and significantly associated with the CEO ownership and the ownership of other directors. Untabulated results reveal no significant coefficients for other the governance elements which include board size, board meetings, and CEO.

Table 6: Relationship between the ratio of share repurchase and individual elements of CGI

	1	2	3	4	5	6	7	8
Board Independence	0.028**							
	(0.01)							
Audit comm.		0.002*						
size		(0.00)						
Audit comm.			0.002**					
meeting			(0.00)					
Nomination comm.				0.001**				
size				(0.00)				
Nomination comm.					0.002**			
meeting					(0.00)			
Remuneration comm. meeting						0.001**		
						(0.00)		
CEO ownership							-0.104**	
							(0.00)	
Directors' ex. CEO ownership								-0.030**
								(0.00)
Cash distribution	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)]	(0.00)	(0.00)	(0.00)	(0.00)
Firm Size	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.00***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RelCashBal	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Undervaluation	0.03*	0.03*	0.03*	0.04*	0.03	0.03*	0.03*	0.03*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Investment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Growth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
opportunities	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.50)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.30***	-0.29***	-0.28***	-0.27***	-0.28***	-0.28***	-0.28***	-0.28***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.00)	(0.03)	(0.03)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (firm-year)	1858	1858	1858	1858	1858	1858	1858	1858
N (firm)	209	209	209	209	209	209	209	209
Log likelihood	265.96	265.09	266.91	266.70	266.75	265.70	265.78	268.49

Notes: The panel Tobit method is used to estimate Equation (2) for explaining share repurchases in dollars divided by total assets. Elements of CGI are included separately in Columns (1) through (8) to remove any effects from multicollinearity (see Appendix A for the elements). The other variables are defined in Appendix B. The standard errors are reported in the parentheses. *, **, *** refer to $p<0.1$, $p<0.05$ and $p<0.01$, respectively.

6.2 Leverage Interacted with Level of Governance

As discussed earlier, share repurchases may be associated with leverage when firms make dividend policy decisions that reflect the maintenance of an optimal capital structure. Although we have consistently found that the ratio of share repurchase is not significantly related to leverage, we expect that better governed firms will exhibit greater sensitivity to the impact of their dividend policy decisions on the maintenance of an optimal capital structure. To test this assumption, our leverage variable is interacted with two of the dummy variables used earlier. The first (second) dummy variable equals one if the firm's level of corporate

(e.g., Kalbers and Fogarty, 1993; Blue Ribbon Committee on improving the effectiveness of corporate audit committees, 1999).

governance falls into the highest (lowest) governance quartile for that period and is equal to zero otherwise. The estimated coefficients for *Leverage* x *GovDum_k=2* and *Leverage* x *GovDum_k=3* in Table 7 show that the incremental moderating effect is significant and negative for firms in the best governance quartile, while insignificant for firms in the worst governance quartile.

Table 7: The relationship between the ratio of share repurchase and governance, controlling for the moderating effect of governance on leverage

	GovDum_k=2 (Best Governance Quartile)				GovDum_k=3 (Worst Governance Quartile)			
	1	2	3	4	5	6	7	8
Govern	0.07***	0.07***	0.04***	0.06***	0.03**	0.03**	0.01	0.03*
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
Leverage	0.00	-0.00*	0.00	-0.01**	-0.01***	-0.01***	-0.00**	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage x GovDum k=	-0.01***	-0.01***	-0.00*	-0.01**				
	(0.00)	(0.00)	(0.00)	(0.00)				
Leverage x GovDum k=					-0.01	-0.01	-0.03**	-0.01
					(0.01)	(0.01)	(0.01)	(0.01)
CashDistPayout	0.02***	0.02***	0.01**	0.02***	0.02***	0.02***	0.01**	0.02***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Firm size	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RelCashBal	0.02	0.02	0.03***	0.02*	0.02	0.02	0.02**	0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Undervaluation	0.06**	0.05**	0.03	0.05**	0.05**	0.05**	0.03	0.05**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Investment	-0.01	-0.01	0.01	0.00	0.00	0.00	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Growth opportunities	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.34***	-1.19	-0.31***	-1.07	-0.31***	-1.23	-0.30***	-1.06
	(0.03)	(1.23)	(0.03)	(1.24)	(0.03)	(1.24)	(0.03)	(1.23)
Year effect	No	Yes	No	Yes	No	Yes	No	Yes
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	No	No	Yes	Yes	No	No	Yes	Yes
N (firm-year)	1846	1846	1846	1846	1846	1846	1846	1846
N (firm)	209	209	209	209	209	209	209	209
Log likelihood	270.562	275.26	219.355	283.385	268.096	272.673	218.654	282.049

Notes: The panel Tobit method is used to estimate Equation (2) for explaining share repurchases in dollars divided by total assets. GovDum_k=2 (GovDum_k=3) is equal to one if the governance index for the firm is in the highest (lowest) quartile. The other variables are defined in Appendix B. The standard errors are reported in the parentheses. *, **, *** refer to $p<0.1$, $p<0.05$ and $p<0.01$, respectively.

6.3 Alternative Measure of the Ratio of Share Repurchase

In this section, we use share repurchases in dollars divided by equity (rather than total assets) as our measure of the ratio of share repurchase. As reported in Table 8, we obtain qualitatively similar results with this alternative dependent variable. Not surprisingly given that we are now scaling by equity and not total assets, the only exception is that Undervaluation becomes insignificant at conventional levels.

Table 8: Robustness check using a different definition of the ratio of share repurchase for the period excluding the GFC

	Alternative definition of share repurchases				Sample without GFC period			
	Unrestricted			Restricted	Unrestricted			Restricted
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Govern	0.068***	0.068***	0.068***	0.103***	0.047***	0.041***	0.044***	0.056***
	(0.019)	(0.019)	(0.019)	(0.025)	(0.016)	(0.014)	(0.014)	(0.017)
CashDistPayout	0.023**	0.027***	0.026***	0.032***	0.020**	0.021***	0.020***	0.022***
	(0.009)	(0.009)	(0.009)	(0.012)	(0.005)	(0.005)	(0.005)	(0.008)
Firm size	0.016***	0.018***	0.018***	0.014***	0.011***	0.012***	0.012***	0.011***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
RelCashBal	0.031*	0.042**	0.039**	0.011	0.019	0.021*	0.019	0.011
	(0.018)	(0.018)	(0.019)	(0.024)	(0.014)	(0.012)	(0.012)	(0.015)
Undervaluation	0.051	0.043	0.042	0.122	0.050**	0.051**	0.049**	0.169***
	(0.038)	(0.038)	(0.038)	(0.081)	(0.025)	(0.024)	(0.024)	(0.050)
Investment	0.000	0.014	0.013	0.017	-0.01	0.004	0.004	-0.001
	(0.01)	(0.012)	(0.012)	(0.014)	(0.010)	(0.009)	(0.009)	(0.011)
Growth	0.004***	0.003***	0.003***	0.003**	0.003***	0.003***	0.003***	0.004**
Opportunities	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Leverage	-0.007**	-0.006*	-0.006*	-0.005	-0.008**	-0.007***	-0.008***	-0.008***
	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.002)	(0.002)	(0.003)
Constant	-2.790	-0.520***	-2.626	-3.222	-1.140	-0.350***	-1.012	-0.790
	(2.425)	(0.046)	(2.435)	(2.755)	(1.230)	(0.039)	(1.220)	(1.470)
Year effect	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N (firm-year)	1846	1846	1846	1111	1846	1846	1846	1111
N (firm)	209	209	209	155	209	209	209	155
Log likelihood	58.122	77.336	81.182	78.087	271.440	276.170	280.850	189.750

Notes: The regression (2) results for explaining share repurchases divided by equity are reported in Columns (1)-(4) and scaled by total assets are reported in Columns (5)-(8) when estimated using the panel Tobit method. GFC refers to the Global Financial Crisis of 2008-2009. The other variables are defined in Appendix B. Columns (4) and (8) are restricted to franked-dividend firms while the other columns include all firms in the time period being examined. The standard errors are reported in the parentheses. *, **, *** refer to $p<0.1$, $p<0.05$ and $p<0.01$, respectively.

6.4 Removal of the Impact of the GFC

Since corporate dividend strategies may have been heavily affected by the Global Financial Crisis (GFC) of 2008-2009, we estimate the same augmented model excluding the GFC period. Results from estimations (5)-(8) in Table 8 generally report similar results to our main findings reported earlier in Table 4. A notable result is that *CashDistPayout* remains statistically significant. *Govern*, which is the variable of our main interest, remains positive and statistically significant at the 1 percent level for all model specifications.

6.5 Alternative Estimation Specifications of the Panel Probit Model

Models (1)-(3) in Table 9 report the random-effects estimation results using the panel Probit method. Both *Govern* and *CashDistPayout* remain significantly positive at the 1 percent level. Hermalin and Weisbach claim that governance variables tend to be endogenous (Hermalin and Weisbach, 2003). One may conjecture that good governance affects the firm's choice of franked dividend which in turn affects repurchase. To readdress this endogeneity, we re-estimate the model again using the Probit instrumental variable two-step method. The included instruments for model (4) in Table 9 are return on assets (ROA) lagged two periods, and the industry dummies. Model (5) includes year dummies in addition to the two instruments used in Model (4). While an increase in *ROA* could lead to the appointments of more outside directors to improve board independence, searching for qualified candidates takes time.

For the instrumental variable specifications (4) and (5) in Table 9, the estimated coefficients of both *Govern* and *CashDistPayout* remain positive and statistically significant, although the magnitude of the estimated coefficient of *Govern* increases somewhat while the coefficient of *CashDistPayout* drops substantially. The results for the other control variables are qualitatively the same as before.

CashDistPayout can also be endogenous. When we use *CashDistPayout* as the Probit instrumental variable in Models (6)-(9) of Table 9, our main findings remain robust. The Wald χ^2 - exogeneity test statistics for the instrumental variables, which are reported near the bottom of Table 9, imply that *CashDistPayout* does not create a serious endogeneity problem, at least from a statistical perspective.

Table 9: Panel Probit estimation using a random-effects specification and an instrumental variable (IV) specification

	Random-effects specification (no IV)			Instrumental variable (IV) specification					
				Governance as instrumented		Cash distribution as instrumented			
	1	2	3	4	5	6	7	8	9
Govern	2.27***	2.10***	2.15***	2.71**	2.70**		1.24***	1.18***	
	(0.68)	(0.69)	(0.69)	(1.35)	(1.30)		(0.41)	(0.41)	
Lag_Govern						0.84**			0.91**
						(0.39)			(0.39)
CashDistPayout	1.06***	1.08***	1.01***	0.38*	0.38*	2.04**	1.28*	1.98**	1.30*
	(0.28)	(0.27)	(0.27)	(0.20)	(0.20)	(0.96)	(0.70)	(0.93)	(0.71)
Firm size	0.60***	0.73***	0.70***	0.26***	0.26***	0.31***	0.31***	0.30***	0.31***
	(0.07)	(0.11)	(0.10)	(0.08)	(0.07)	(0.04)	(0.04)	(0.04)	(0.04]
RelCashBal	0.68	1.24*	1.03	0.94**	0.93**	0.99**	0.88**	1.01**	0.87**
	(0.66)	(0.64)	(0.64)	(0.43)	(0.42)	(0.41)	(0.40)	(0.41)	(0.40)
Undervaluation	2.11*	2.08*	1.98*	0.55	0.53	-0.17	0.17	-0.08	0.09
	(1.18)	(1.19)	(1.18)	(0.77)	(0.77)	(0.91)	(0.84)	(0.90)	(0.85)
Investment	-0.44	-0.05	-0.04	0.17	0.17	0.47	0.33	0.45	0.34
	(0.44)	(0.51)	(0.48)	(0.22)	(0.22)	(0.29)	(0.27)	(0.29)	(0.27)
Growth opportunities	0.17***	0.13***	0.15***	0.07***	0.07***	0.05**	0.06***	0.05**	0.06***
	(0.04)	(0.04)	(0.04)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Leverage	-0.3***	-0.32**	-0.3***	-0.14**	-0.14**	-0.11	-0.13*	-0.11	-0.13*
	(0.12)	(0.12)	(0.12)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Constant	-125.6**	-19.7***	-113.4*	-8.9***	-8.9***	-9.1***	-9.1***	-9.2***	-9.0***
	(63.09)	(2.69)	(63.23)	(0.85)	(0.83)	(0.77)	(0.8)	(0.78)	(0.80)
Two-lagged ROA	N.A.	N.A.	N.A.	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	N.A.	N.A.	N.A.	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	N.A.	N.A.	N.A.	No	Yes	No	Yes	No	Yes
Exog_test(p)	N.A.	N.A.	N.A.	0.39	0.31	0.08	0.17	0.08	0.16
N (firm-years)	1846	1846	1846	1438	1438	1436	1438	1438	1436
Log likelihood	-468.57	-466.15	-460.08	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Notes: Exog_test refers to the Wald χ^2- test for exogeneity where p refers to the p-value. The governance variable is the instrumental variable in models (4) and (5) and *CashDistPayou*t is the instrumental variable in models (6)-(9). ROA lagged two periods and industry dummies are not included in models (4)-(9) and year dummies are only included in models (4), (6) and (8). The standard errors are reported in the parentheses. *, **, *** refer to p<0.1, p<0.05 and p<0.01, respectively.

7. Conclusion

Since 2003, Australian firms must comply with the Principle of Good Corporate Governance and Best Practice Recommendations. Since the full imputation tax system in Australia substantially differs from that in many other countries (including the U.S.), we investigated the effect of corporate governance using a developed CGI and its elements on share repurchases by Australian firms for the 2004-2013 period. We found corporate governance to be positively associated with share repurchases, which is consistent with existing studies. While good governance can increase shareholder wealth and discipline manager's misbehaviour, our results imply that improved governance of Australian firms is proportionately more designed to increase the wealth of shareholders by increasing share repurchases than minimising the private consumptions of managers.

Contrary to findings in the U.S. and Sweden, we found that cash distributions are positively associated with share repurchases. We attribute this difference to the full imputation tax regime adopted in Australia that results in Australian shareholders perceiving cash distributions and buybacks as being complementary. A further examination illustrated that good firm governance increases the positive association of cash distributions with share repurchases. We also found that good governance attenuates the negative association between firm leverage and share repurchases and that poor governance has little effect on this association. Our main findings are robust to a number of robustness checks. These included the use of the individual elements of CGI and a different measure of share repurchases, examining the role of leverage interacted with the level of governance, removal of observations during the Global Financial Crisis (GFC), and the use of different estimation specifications to deal with endogeneity.

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Appendices

Appendix A: Corporate governance index

1.	Board function	• Board size (measured as the number of directors in each company during the year) is scored one if it is greater than the mean of sample board size in each year. • Independence of the directors (measured as the proportion of non-executive directors on the board (Monem, 2013) is scored one if it is greater than 50% of directors on the board. • Number of board meetings (measured as the number of board meetings in each company) is scored one if it is greater than the mean of sample board meetings in each year.
	Managerial ownership	• Existence of Chairman and CEO separation is scored one. • Directors' control (measured as the total number of shares held by directors excluding the CEO of each company) is scored one if it is less than 5% of total outstanding shares in the company. • CEOs' control (measured as the number of shares held by the CEO in each company) is scored one if it is less than 5% of total outstanding shares in the company.
2.	Audit function	• Existence of an audit committee is scored one. • The committee meets at least once annually is scored one. • Engagement of Big Four auditors is scored one.
3.	Nomination committee	• Existence of a nomination committee is scored one. • The committee meets at least once annually is scored one.
4.	Remuneration committee	• Existence of a remuneration committee is scored one. • The committee meets at least once annually is scored one.

Notes: This table identifies the criteria used in constructing the corporate governance index. Each question is constructed so that the answer 'yes' adds one point to the governance score. The rating is on a scale of zero to thirteen, with a higher score indicating better governance. The aim is to generate an index ranging between zero and one by identifying a firm's satisfaction of each of the thirteen selected governance elements. The index developed in this paper is based on four categories: board function, audit, nomination committee, and remuneration committee. Board function relates to the structuring of boards and board meetings as crucial elements of governance. The audit committee and external auditor convey a fair and balanced view of the organization, which may lead to either additional reporting requirements or assurance from management that the interests of shareholders will be foremost in their priorities. The nomination committee deals with appointments and resignations of directors. The remuneration committee encourages personal involvement of managerial handling of agency problems by providing profit-related incentives, such as bonds. The index covers various aspects of the structure and policies of companies that comprise good governance practices. The index includes external governance factors, such as the external auditor. The main theoretical framework for developing the index is the ASX Principles of good governance and best practice recommendations. Introduction of the ASX listing rule 4.10.3 requires firms to disclose and comply with governance guidance, and also publication of the ASX Principles of good governance and best practice recommendations in their annual report. The construction of the index based on ASX (2003) is as follows:

- Principle 2: Structure the board to add value – Companies should have a board with an effective composition, size and commitment to adequately discharge its responsibilities and duties. This principle can emphasize the importance of board size and meetings.
- Recommendation 2.1: A majority of the board should be independent.
- Recommendation 2.3: The roles of chairperson and chief executive officer should not be held by the same individual.

By considering the voting right of shareholders who hold more than 5% of the shares, and the importance of the directors being independent from the company, this paper believes that if directors and/or CEOs hold less than 5% of shares, share repurchases can be used more effectively as one of the main tools to reduce agency problems.

- Recommendation 4.2: The board should establish an audit committee.
- Recommendation 2.4: The board should establish a nomination committee.
- Recommendation 9.2: The board should establish a remuneration committee.

Appendix B: Definition of the variables and their computation

Variable	Definition
CashDistPayout	Ratio of cash distributions divided by net income.
Firm size	Natural logarithm (ln) of total assets.
Govern	Corporate governance index with a normalized value between zero and one that consists of thirteen binary elements where one indicates that the governance condition for that element is satisfied. The elements cover board functions including managerial ownership, audit function, nomination committee, and remuneration committee. For more details, see Appendix A.
GovDum_k=1	Dummy variable equal to one if the corporate governance index for the firm is above the median and 0 otherwise.
GovDum_k=2	Dummy variable equal to one if the corporate governance index for the firm is in the highest quartile.
GovDum_k=3	Dummy variable equal to one if the corporate governance index for the firm is in the lowest quartile.
Growth opportunities	Ratio of market to book value.
Investment	Ratio of property, plant and equipment (PPE) divided by total assets.
Leverage	Ratio of total liabilities to total equities divided by the average of this ratio for the firm's industry.
RelCashBal	*C*ash divided by total assets.
Share Repurchase	Share repurchases in dollars divided by total assets.
Undervaluation	EBIT divided by share price.