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Dividend reductions, the timing of dividend payments and information content

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ABSTRACT

Australian companies pay dividends semi-annually with smaller "interim" payments and larger "final" payments. Interim dividends are declared and paid within a less full information environment than final dividends. We analyze the interactions between the timing of dividends and their information content, controlling for share repurchase and tax effects. Dividend reductions that are not associated with share repurchases are statistically significantly related to future abnormal earnings and provide strong support for the information content of dividend reductions. The percentage of dividend reduction is stronger for interim than for final dividend reductions. The market reaction is negatively related to the reduction in imputation tax credit and reacts more aggressively and negatively to interim as compared to final dividend reductions.

1. Introduction

Although theoretical studies (Bhattacharya (1979, 1980), John and Williams (1985), Miller and Rock (1985)) predict that dividend changes are indicative of future earnings changes, empirical studies in the US do not support such predictions (see DeAngelo et al. (1996), Benartzi et al. (1997), Grullon et al. (2005)). Brav et al. (2005) survey and interview a large number of executives of U.S firms and find that 80% of executives believe that the dividend decision conveys information to investors. However, they find that the assumptions underlying many signaling models do not reflect either managers' intentions or a realistic market structure. Interviews with executives yield no evidence to support the notion of managers initiating or increasing payout as a self-imposed cost of revealing a firm's private information. Brav et al. (2005) find that managers strive to avoid dividend cuts, except in the most extraordinary circumstances:

> "Several executives told us that they would try to avoid reducing dividends, if possible, especially if they thought that their own firm would be affected only temporarily by the liquidity crisis. They reason that the market thinks that only firms

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> experiencing long-lasting and severe liquidity crisis cut dividends and the firm would not want to give the misimpression that it expects its own liquidity crisis to be severe."

Allen and Michaely (2003), DeAngelo et al. (2008) and Skinner and Soltes (2011) distinguish between the concepts of the signaling power of dividends and the information content of dividends. Skinner and Soltes (2011) state that there is now a general agreement that the traditional view of signaling – under which managers use dividends to signal future earnings prospects – is not empirically descriptive. They argue that the evidence against the traditional signaling model does not mean, however, that dividends are not informative, especially if there are doubts regarding the credibility of managers' financial reporting practices. They show that dividends are informative with respect to firms' earnings prospects, although not in the traditional sense of signaling future earnings changes. Allen and Michaely (2003) argue that dividends provide information about earnings via the sources and uses of funds identity as, for example, in Miller and Rock (1985) and that the information content of dividends does not necessarily imply that dividends are being used as a signal. They argue that this distinction may be subtle, but it is crucially important in interpreting the empirical tests regarding dividend signaling theory. DeAngelo et al. (2008) argue that

> "Although dividend reductions are typically associated with large share price declines, this fact alone does not indicate that managers deliberately use dividend cuts to signal bad news to investors. In most cases, provided that dividend changes are an effective communication device, managers' incentives are to use cash payouts to convince outside investors that the future is rosier, not bleaker, than it would otherwise seem. While it therefore seems unlikely that managers generally use dividend cuts to signal bad news to investors, in specific situations, managers apparently use dividend cuts strategically to "plead poverty" and thereby to help convince nonstockholder outsiders who do not share managers' inside information either to provide financial relief to, or to forego certain claims against the firm."

In the spirit of Allen and Michaely (2003), Brav et al (2005) and DeAngelo et al (2008), then, we examine the information content of dividend reductions by focusing on the dividend reductions which are not associated with share repurchase activity around the dividend reduction in an environment where dividend payments differ from the US in two important aspects: i) the frequency of the payment of dividends, and ii) the taxation on dividends. In the US, dividends are paid on a quarterly basis, the amount of dividend paid each quarter being more or less equal. In Australia, most firms pay dividends twice a year, with relatively smaller amounts paid at the interim (first half yearly) and larger amounts at the final level (second half yearly). Since interim dividends are declared and paid prior to the availability of the annual accounting results the quantum of information available to investors at this earlier stage is less than that available when the final dividend is paid. We analyze the interactions between the timing of dividends and their information content, controlling for share repurchase effects, thereby providing new insights into the dividend/earnings debate.

An imputation tax system operates in Australia where Australian companies provide resident shareholders with a credit for company tax paid in Australia that can be used to offset their personal tax on dividend income.[1] Tax credits are not available to non-resident shareholders. The dividends paid out of companies' after tax profits (when company tax is paid on these profits in Australia) carry imputation credits, and are referred to as franked dividends. Any dividends arising from the profits on which no Australian company tax has been paid are known as unfranked dividends and therefore subject to tax at the shareholders' marginal income tax rate. However, the Australian imputation tax system, via its alleviation of the double taxation on dividend income, does not provide any tax incentives for open market stock repurchases (known as "on market buybacks" in Australia). The executives in the Brav et al (2005) survey indicate that taxes are a second-order payout policy concern and most say that tax considerations are not a dominant factor in their decision about whether to pay dividends or to increase dividends, or in their choice between payout in the form of repurchases or dividends. As such the Australian imputation tax system may not have any significant impact on the information content of dividend reduction. However, we control for the potential impacts of imputation tax credits in our research design in examining the relation between dividend reductions and future earnings and in examining the market reactions to dividend reductions.

Prior research finds a significant negative price reaction around announcement dates to both dividend decreases and omissions (Healy and Palepu (1988), Michaely et al. (1995), Benartzi et al. (1997), Jensen et al. (2010)) supporting the notion that there is information content in dividend reductions. Healy and Palepu (1988) find a negative price reaction to the announcement of dividend omissions and the reaction is positively related to earnings changes during the year of and the year after the dividend omissions. They argue that this evidence is consistent with dividend omissions conveying information regarding future earnings performance. However, there is a scarcity of research on the price reaction to dividend decreases and omissions in an environment where dividend payments carry tax credits and the impact of the reduction in tax credits on price reactions. This study addresses this shortfall.

Although prior research documents significant negative price reactions to the announcement of dividend decreases and omissions, there is generally a lack of empirical support for a decline in earnings subsequent to dividend decreases and omissions. Healy and Palepu (1988) find that median changes in earnings for firms that omit dividends decline during the year of, and the two year period prior to, the dividend omissions, but that they increase for the three year period after the dividend omissions. Benartzi et al. (1997) find a decline in earnings during the year of dividend decreases and an increase in earnings for the year after. However, Barber and Lyon (1996) argue that inferences about future performance around corporate events should not be based on levels of performance over time, but rather on an expectations model that incorporates a firm's pre-event performance.

[1] A description of the Australian dividend imputation tax system can be found in, for example, Cannavan et al. (2004).

They demonstrate that test statistics are well specified only when sample firms are matched to control firms with similar pre-event performance. Lie (2001) shows that the most reliable test statistics are generated with control firms that have similar prior operating performances and market-to-book ratios. He also shows that it is more important to control for levels of performance rather than changes in performance and market-to-book ratios. Plausible reasons for the lack of support for earnings declines subsequent to dividend decreases in Benartzi et al. (1997) and subsequent to dividend omissions in Healy and Palepu (1988) include a failure to control for pre-event performance level matched firms in calculating changes in future earnings (abnormal earnings).

When Brav et al. (2005) asked the managers of dividend paying firms what they would do with the extra funds that they would have available were they to cut dividends, more than 20% of the respondents answered that they would repurchase shares. Grullon et al. (2011) find that the propensity to pay out dividends has been decreasing, both unconditionally and conditionally. This seems to be due largely to an increasing degree of substitution from dividends to share repurchases. Furthermore, Skinner (2008) finds support for the proposition that repurchases are increasingly used to supplement dividends as a means of distributing cash to shareholders. Surprisingly, prior studies do not control for share repurchases in examining the information content of dividend reductions. Lie (2005a) examines the information content of dividend decreases and omissions of US firms by comparing their performance with firms matched on pre-event performance, industry and market to book ratios, and finds some support for information content in dividend decreases and omissions. He finds that operating performance drops during the quarter of, and the quarter after, the announcement of dividend decreases, while operating performance drops during the quarter of, and two quarters after, the announcement of divided omissions. He finds a slight spike in share repurchases around the quarter of dividend decreases and omissions. However, he did not find any significant difference in share repurchase activity between sample firms and control firms. He concludes that "it is unlikely that contemporaneous increases in share repurchase activity offset any negative signal associated with the dividend cuts on an *aggregate basis*." Lie (2005a) did not, however, examine the information content of dividend cuts and omission conditioning on the share repurchasing status of dividend reducers during the year of the dividend reduction.

Jensen et al. (2010) argue that a dividend reduction indicates the firm has reached a "last resort" situation and is planning to undertake actions which will build up its financial resources. They show that dividend reduction firms, relative to their competitors, tend to engage in significant reductions in capital expenditures, R&D expenditures and numbers of employees. They also find that dividend reduction firms experience reductions in operating performance relative to their competitors for each year from the two year period prior to the dividend reduction up until three years after the dividend reduction. However, they do not control for pre-event performance, book to market ratio and share repurchase activity around dividend reduction firms in selecting their control firms.

Thus, further research that examines the information content of dividend decreases and omissions when firms do not substitute dividend reductions with repurchases will provide new insights into the information content of dividend reductions. To address this potentially important factor within the research design, we examine the information content of dividend reductions for firms that reduce dividends with no contemporaneous repurchasing activities and also for firms that reduce dividends and contemporaneously engage in repurchasing activity.

Our empirical results using a matched sample procedure indicate that abnormal earnings are negative both during the year of, and for each year within, the three year period after the dividend reductions for the sample of dividend reductions that do not have any contemporaneous share repurchase activity. Interestingly and importantly, we find insignificant abnormal earnings for each year within the same three year period for the sample of dividend reductions that contemporaneously engage in repurchasing activity. Our results are robust when we use abnormal operating performance instead of abnormal earnings. Thus, our results indicate that the share repurchasing status of the dividend reducing firm is an important variable to control for within the research design. The reduction in franking credit or franking status of a dividend or the timing of dividend payments (interim or final) does not have any significant relationship with future earnings. However, we find that franking related variables do impact upon the choice of the percentage of the dividend reduction. That is, while the tax status of the dividend does have a significant impact upon size of the dividend reduction, it has no relationship with future earnings and thus does not provide any information content.

We also find that dividend reductions are associated with negative stock price reactions and that the magnitude of the price reaction is negatively related with the percentage of the dividend reduction and the reduction in franking credit. The market reacts more negatively to interim dividend reductions than to final dividend reductions. Overall, our study demonstrates that dividend reductions that are not associated with share repurchases do have "information content," that is, they provide (negative) information regarding future earnings. While the tax credit does not impact upon the information content, the market does value the tax credit and reacts negatively to the reduction in the tax credit. That is, the tax dimension has pricing implications rather than generating information effects.

The plan of this paper is as follows. Section 2 discusses hypothesis development, while Section 3 presents a discussion of our data and methods employed. Section 4 examines the relation between dividend reductions and future abnormal earnings. In section 5 we provide empirical evidence regarding the market response around the announcements of dividend reductions. In Section 6 we analyze the factors that determine the level of the dividend reduction, in particular, focusing upon the impact of the tax status of the dividend. In Section 7 we examine the factors that determine the decision to reduce dividends at the interim level rather than delay to the final stage. Finally, our conclusions are presented in Section 8.

2. Hypothesis development

Eighty percent of executives surveyed in Brav et al. (2005) believe that dividend decisions do convey information to investors. However, nearly three quarters of the interviewed executives perceive a substantial asymmetry between dividend increases and

decreases — that is, there is not much reward in increasing dividends, but there is perceived to be a large penalty associated with reducing dividends. Moreover, managers express a strong desire to avoid dividend cuts, except in extraordinary circumstances. However, beyond maintaining the level of dividends per share, payout policy is a second-order concern; that is, increases in dividends are considered only after investment and liquidity needs are met. Allen and Michaely (2003) document an asymmetric response to dividend increases and decreases (and for initiations and omissions), which implies that lowering dividends carries more informational content than increasing dividends, perhaps because reductions are more unusual, or because reductions are of greater magnitude. In his classical paper, Lintner (1956) argues that dividends would be reduced to reflect any "substantial or continued decline in earnings". The executives in the Brav et al (2005) survey indicate that taxes are a second-order payout policy concern and more than two-thirds of dividend payers indicate that the dividend tax reduction would either definitely not, or probably not, affect their dividend decisions. Taking these results and arguments together, we argue that managers of companies that experience earnings declines and/or expect declines in future earnings will reduce their dividends, irrespective of the tax status of the prior year dividend (that is, either franked or unfranked). Lie (2005b) examines the information content of repurchase programs of US firms by comparing their performance with firms matched on pre-event performance, industry and market to book ratios and documents that the operating performance improves following the announcements of open market share repurchase programs and that the operating performance improvement is limited to those firms that actually repurchase shares during the same fiscal quarter. Brav et al (2005) find that managers displayed a tendency to use the proceeds of dividend reductions to repurchase shares. As such any negative information conveyed by the dividend reduction of firms that reduce their dividend and repurchase shares during the year of the dividend reduction will be most likely offset or reduced by the share repurchase activity. Furthermore, the percentage dividend reduction will be greater for companies experiencing larger declines in earnings in the current year and/or that expect large declines in earnings in the future. This leads to the following set of hypotheses:

H1(a). *Dividend reductions that are not associated with share repurchase activity around dividend reductions will provide information content regarding declines in future earnings, irrespective of the tax status of the prior year dividend.*

H1(b). *Negative information conveyed by dividend reductions that are associated with share repurchase activity around dividend reductions will be offset or reduced by the share repurchase activity.*

H2. *The magnitude of the dividend reduction will be negatively related to future abnormal earnings.*

Reductions in dividends will have negative information content, largely because firms are reluctant to reduce dividends as indicated in our previous discussions. Extant research has shown that the market reacts negatively to dividend reductions. Australian firms pay dividends twice a year, with relatively smaller amounts paid at the interim and larger amounts at the final level. Faced with declining future prospects, managers have the choice of reducing interim dividends versus postponing the reductions to the announcement of final dividends. Since there is less information available when determining the interim dividend, there will be a tendency on the part of management to delay the unpopular dividend reduction to the final level when the need for such a reduction may be more conclusively supported via the richer information set then available. When, however, the future prospects are incontrovertibly poor, this deferral to the final dividend will be difficult to sustain and therefore, we argue that firms experiencing such severe difficulties will reduce the dividend at the interim stage rather than delay the reduction to the final dividend. Extant research studies show that the impact of new information on stock prices depends on the magnitude of the surprise as well as the quantum of pre-disclosure information. During the period of announcement of interim dividends both managers and outside investors have incomplete information regarding the earnings of the firm during the current year to date (that is, only unaudited interim figures are available, containing a number of estimated figures). However, managers at this stage will still have access to information that is not available to outsiders. Furthermore, when interim dividends are announced, outside investors have few competing sources of information regarding the future prospects of the firm. Thus, the market will react more strongly to interim dividend reductions than to reductions of the final dividend. Therefore, we have the following two hypotheses:

H3. *Interim dividend reductions will produce a stronger price reaction as compared to final dividend reductions, other things being equal.*

H4. *Firms experiencing stronger declines in earnings in the current year will reduce dividends at the interim rather than delaying the reduction to the final.*

3. Data and methodology

In this section we describe the sample selection procedures and the distribution of dividend reductions; the characteristics of dividend reducing firms; the matching procedures to calculate abnormal earnings/operating performances for the year of and three years after the dividend reduction; and abnormal return generation and test statistics.

3.1. Data and sample selection

Initial interim and final dividend reductions are identified for Australian companies for the period between January 1995 and December 2008, where there are no dividend reductions (either interim or final) during the two-year period immediately

preceding the initial interim and final reductions.[2] A dividend reduction is defined relative to the previous year's level, i.e. there is a reduction if the interim (final) dividend per share in year *t* is less than the interim (final) dividend per share paid in year t − 1. We find 331 dividend reductions in total, 153 interim dividend reductions and 178 final dividend reductions. We also find that 298 dividend reductions are not associated with share repurchasing activity during the year of the dividend reduction announcements (denoted hereafter as DREDNORP) whereas 33 dividend reductions have share repurchasing activity during the year of the dividend reduction announcements (referred to as DREDRP).[3] The relative magnitude of the two categories reflects, in part, the fact that the Australian tax system does not provide strong incentives for share repurchases.

Panel A of Table 1 contains the distribution of our sample across the years classified into DREDNORP, and DREDRP. The sample is not strongly dominated by any one year, although the first year of our sample frame, 1995, did contain, by far, the smallest sample size (at 9 reductions, in total). DREDRP is strongly dominated in 2008. In Panel B of Table 1, we present the industry classifications for DREDNORP and DREDRP. We find that three of the industry groups, viz., Materials, Capital Goods and Diversified financials account for over 39% of our sample of dividend reductions. Food, Beverage and Tobacco, Commercial Services and Supplies, Real Estate and Retailing together account for about 27% of the sample. The other 34% of the sample is distributed across all other sectors. The definition of the variables used in this study is provided in Table 2.

3.2. Firm characteristics of dividend reducing firms

Table 3 provides information on financial characteristics such as total assets, earnings for the year prior to the dividend reduction, earnings during the year of dividend reduction, changes in earnings during the year of dividend reduction, operating performance for the year prior to the dividend reduction, operating performance for the year of the dividend reduction, changes in operating performance during the year of the dividend reduction, the riskiness of the firm (idiosyncratic risk), ownership concentration (TOP20: top 20 shareholders ownership and BH: blockholders holding 5% or above), market value, the gearing ratio, percentage of dividend reduction and the book to market ratio. Panel A of Table 3 provides information on these financial characteristics for dividend reducers without share repurchasing activity (DREDNORP) and dividend reducers with share repurchasing activity (DREDRP) around dividend reductions.[4] Panel B provides the information on the financial characteristics of subsamples obtained by partitioning the sample into interim and final dividend reductions.

As can be seen in Panel A of Table 3 we find that firms with higher equity capital relative to total assets and with lower ownership concentrations reduce dividends and are involved in repurchasing activity during the year of dividend reductions. The magnitude of the dividend reduction is lower for DREDRP than for DREDNORP. We do not find any difference in prior year earnings, current year earnings, changes in current year earnings, prior year operating performance, current year operating performance, changes in operating performance, book to market ratio or risk between the DREDNORP and DREDRP sub-samples. As can be seen in Panel B of Table 3, we find that the prior year earnings, and prior year operating performance are lower for the interim reductions as compared to the final reductions sub-sample. The median earnings and median operating performance during the year of the dividend reduction are also significantly lower for firms that reduce interim dividends as compared to final dividend reducing firms. Furthermore, the changes in earnings and changes in operating performance are significantly more negative for interim dividend reducers as compared to final dividend reducers. The extent of the dividend reduction is stronger for interim than for final dividend reductions. Taken together, these results indicate that firms which face lower earnings and steeper declines in earnings tend to prefer reductions in interim dividends rather than postponing the reductions to the final stage.

Another interesting fact that emerges is that the firm size (market capitalization and total assets) of interim dividend reducers is statistically significantly lower than that for final dividend reducers. The book-to-market ratio at the balance sheet date immediately prior to the year of dividend reduction is higher for interim dividend reducers than that of final dividend reducers. This finding plausibly implies that firms with higher growth opportunities (or lower tangible assets) tend to defer their dividend reductions to a future period. We do not find any significant difference in ownership concentration (top 20 shareholders ownership or blockholders holding 5% or above) between interim and final dividend reducers. Finally, we find that interim dividend reducers have significantly higher idiosyncratic risk as compared to final dividend reducers. These findings indicate that smaller and riskier firms with larger declines in earnings or operating performance (i.e. essentially lower quality firms) prefer to conserve cash by choosing to go for interim reductions instead of deferring their reductions to the final dividends.

3.3. Abnormal earnings, information content and dividend reductions

To examine the information content of dividend reduction announcements, we investigate how the percentage of dividend reductions is related with abnormal earnings for the three years after the dividend reduction. We define abnormal earnings as the paired difference in net profit after tax to total assets between dividend reduction firms and control firms. Barber and Lyon (1996)

[2] We consider only initial dividend reductions since they are likely to provide stronger information regarding future earnings as opposed to subsequent reductions which may be anticipated and wherein the innovation in the dividend series will be much less.

[3] We have excluded the dividend reduction events that are announced simultaneously with share buybacks or stock splits or seasoned equity offerings or merger or acquisition or convertible bond issues.

[4] The definition of the variables used in this study is provided in Table 2.

Table 1
Description of dividend reductions sample.
This table provides year by year Analysis and industry by industry analysis for Australian firms that reduce dividends. DREDNORP: firms reduce their dividends and do not repurchase shares during the year of the announcement of dividend reduction. DREDRP: firms reduce their dividends and repurchase shares during the year of the announcement of dividend reduction.

Panel A — dividend reduction year by year analysis

Year	All dividend reductions	DREDNORP	DREDRP
1995	9	9	–
1996	27	27	–
1997	14	14	–
1998	14	14	–
1999	28	25	3
2000	21	19	2
2001	36	31	5
2002	22	20	2
2003	29	26	3
2004	15	14	1
2005	22	20	2
2006	32	30	2
2007	27	22	5
2008	35	27	8
Total	331	298	33

Panel B — dividend reductions industry by industry analysis

Industry	All dividend reductions	DREDNORP	DREDRP
Automobiles and components — 2510	11	9	2
Banks — 4010	7	6	1
Capital goods — 2010	40	35	5
Commercial services and supplies — 2020	21	19	2
Consumer durables and apparel — 2520	12	11	1
Consumer services — 2530	6	6	–
Diversified financials — 4020	35	29	6
Energy — 1010	8	7	1
Food and staples retailing — 3010	5	5	–
Food beverage and tobacco — 3020	25	24	1
Health care equipment and services — 3510	9	8	1
Insurance — 4030	9	9	–
Materials — 1510	53	50	3
Media — 2540	15	11	4
Oil and gas — 1010	1	1	–
Industrial conglomerates — 2015	1	1	–
Real estate — 4040	21	21	–
Retailing — 2550	21	18	3
Software and services — 4510	11	10	1
Technology hardware and equipment — 4520	7	6	1
Telecommunication services — 5010	1	1	–
Transportation — 2030	9	8	1
Utilities — 2040	3	3	–
Total	331	298	33

show that when sample firms experience pre-event performance that is even slightly different from control firms, matching sample firms to control firms on industry, or industry and size, yields test statistics that are misspecified. They show that test statistics are well specified only when sample firms are matched to control firms with similar pre-event performance. Lie (2001) shows that the method that generates control firms with similar prior levels and changes of performance and similar market-to-book ratios produces the most reliable test statistics. He also shows that it is more important to control for levels of performance than changes in performance and market-to-book ratios. Jensen et al (2010) argue that in order to assess the abnormal characteristics of firms that announce a reduction in their established dividend, it is important to have a control firm that is similar in attributes, but did not reduce its dividend. As such we use pre event level of performance, industry classification, book to market ratio and no reduction in dividend during the year of the sample firm dividend reduction to identify control firms. As our study conditions on the repurchasing status of the dividend reduction firm we also choose a control firm that does not engage in share repurchasing activity during the year of the sample firm dividend reduction.

We select control firms based on the following criteria in order of importance: (a) earnings performance ($NPAT/TA_{t-1}$) for the year immediately prior to the dividend reduction is between 90% and 110% of the sample firm, no reduction in dividend and no share repurchase activity during the year of the sample firm dividend reduction; (b) industry classification based on Global Industry Classification Standard (two digit 10 industry sectors); and (c) book to market ratio is between 70% and 130% of the

Table 2
Definition of the variables used in this study.

Variable name	Definition
BM	Is the book to market ratio at the balance sheet date prior to the year of dividend reduction.
BH	Is the proportion of shares owned by blockholders of 5% or more at the balance sheet date prior to the year of dividend reduction.
DIOF	Is a dummy variable DIOF where DIOF equals 1 if the firm reduces its dividend at the interim stage and zero if the firm reduces the dividend at the final stage.
DRED	Is the percentage dividend reduction.
DUFRDR	Is a dummy variable takes value of 1 if the firm paid unfranked dividend for the year prior to the dividend reduction and zero for franked (full or partial) dividend paid for the year prior to the dividend reduction.
DREDNORP	Firms reduce their dividends and do not repurchase shares during the year of dividend reduction.
DREDRP	Firms reduce their dividends and repurchases shares during the year of dividend reduction.
GEARING	Is the ratio of equity to total assets at the balance sheet date prior to the year of dividend reduction.
IDYRISK	Is the idiosyncratic risk measured as the standard error of the market model regression of daily stock returns over the period from day −260 to day −61 for each issuing company.
LBM	Is the natural logarithm of the book to market ratio at the balance sheet date prior to the year of dividend reduction.
LMV	Is the natural logarithm of the market value of the company one month prior to the announcement of dividend reduction.
MV	Is the market value of the company one month prior to the announcement of dividend reduction.
NPAT/TA$_t$	Is earnings for the year of dividend reduction measured as net profit after tax during the year of dividend reduction standardized by total assets at the balance sheet date for the year of dividend reduction.
NPAT/TA$_{t-1}$	Is earnings for the year before the dividend reduction measured as net profit after tax for the year before the dividend standardized by total assets at the balance sheet date for the year prior to the dividend reduction.
EBITDA/TA$_t$	Is earnings before interest, tax, depreciation and amortization to total assets for the year of dividend reduction measured as EBITDA for the year of dividend reduction standardized by total assets at the balance sheet date for the year of dividend reduction.
EBITDA/TA$_{t-1}$	Is earnings before interest, tax, depreciation and amortization to total assets for the year before the dividend reduction measured as EBITDA for the year before the dividend reduction standardized by total Assets at the balance sheet date for the year before the dividend reduction.
ΔNPAT/TA $_t$	Is changes in earnings for the year before the dividend reduction measured as NPAT/TA$_t$ minus NPAT/TA$_{t-1.}$
ΔEBITDA/TA $_t$	Is changes in EBITDA to total assets measured as EBITDA/TA$_t$ minus EBITDA/TA$_{t-1.}$
AΔNPAT/TA$_t$	Is abnormal earnings for the year of the dividend reduction measured as difference in NPAT/TA between sample firms and control firms for the year t.
AΔNPAT/TA$_{t+1}$	Is abnormal earnings for the year after the dividend reduction measured as difference in NPAT/TA between sample firms and control firms for the year t + 1.
AΔNPAT/TA$_{t+2}$	Is abnormal earnings for the second year after the dividend reduction measured as difference in NPAT/TA between sample firms and control firms for the year t + 2.
AΔNPAT/TA$_{t+3}$	Is abnormal earnings for the third year after the dividend reduction measured as difference in NPAT/TA between sample firms and control firms for the year t + 3.
AAΔNPAT/TA$_{3yrs}$	Is average abnormal earnings per year for the three year period after the dividend reduction measured as average of AΔNPAT/TA$_{t+1,}$ AΔNPAT/TA$_{t+2,}$ and AΔNPAT/TA$_{t+3.}$
AΔEBITDA/TA$_t$	Is abnormal operating performance for the year of the dividend reduction measured as difference in EBITDA /TA between sample firms and control firms for the year t.
AΔ EBITDA /TA$_{t+1}$	Is abnormal operating performance for the year after the dividend reduction measured as difference in EBITDA /TA between sample firms and control firms for the year t + 1.
AΔ EBITDA /TA$_{t+2}$	Is abnormal operating performance for the second year after the dividend reduction measured as difference in EBITDA /TA between sample firms and control firms for the year t + 2.
AΔ EBITDA /TA$_{t+3}$	Is abnormal operating performance for the third year after the dividend reduction measured as difference in EBITDA /TA between sample firms and control firms for the year t + 3.
AAΔ EBITDA/TA$_{3\ years}$	Is average abnormal operating performance per year for the three year period after the dividend reduction measured as average of AΔ EBITDA /TA$_{t+1,}$ AΔ EBITDA /TA$_{t+2,}$ and AΔ EBITDA /TA$_{t+3.}$
PERFRANK	Is the percentage of franking of dividend for the year prior to the dividend reduction.
RFC	Is the reduction in franking credit per share in during the year of dividend reduction at the interim (final) dividend relative to interim (final) dividend for the year prior to the dividend reduction standardized by share price two days prior to the announcement.
TOP20	Is the proportion of shares held by the top twenty shareholders relative to total shares outstanding at the balance sheet date prior to the year of dividend reduction.
Year t	Is the year of the dividend reduction.

sample firm (BM). Details of the procedure employed to select control-sample firms are given in Panel A of Table 4.[5] For each sample firm, we first identify all firms within the same industry sector, with earnings within ±10% of sample firm, and with BM ratios within ±30% of the sample firm. Then we eliminate the firms that had dividend reduction or repurchasing activity during the sample firm's dividend reduction year. When we find more than one control firm we choose the firm with the closest earnings to the sample firm. We find that 55% of the sample firms meet all these three criteria. If no firms meet the three criteria in (a) to (c), we disregard the book to market criterion. We find that 16% of firms meet the criteria in (a) and (b). Then we disregard the

[5] We also try to find control firms based on changes in earnings of the sample firm during the year of dividend reduction, from a similar industry, similar BM ratio, no dividend reduction and no share repurchase activity by control firm during the year of the dividend reduction of the corresponding sample firm. However, we were unable to find sufficient control firms using this procedure.

Table 3
Financial characteristics of dividend reductions' firms.
This table provides univariate statistics on firm characteristics for Australian firms that reduce dividends. Panel A provides results for two subgroups: (a) firms reduce their dividends and do not repurchase shares during the year of the announcement of dividend reduction (DREDNORP), and (b) firms reduce their dividends and repurchase shares during the year of the announcement of dividend reduction (DREDRP). Panel B provides results partitioning the sample of firms that reduce their dividends into interim versus final dividend reductions. This table also provides nonparametric Mann Whitney (MW) statistics for the difference in median between two sub groups. $NPAT/TA_t$: Net profit after tax in period t standardized by total assets in period t; $EBITDA/TA_t$: earnings before interest, tax and depreciation and amortization in period t standardized by total assets in period t; Δ: First difference operator; MV: Market value one month prior to the dividend reduction; BM: Book to Market ratio in period t − 1; BH: Blockholders holding 5% or more of common stock at the balance sheet date immediately prior to the dividend reduction announcement; Top20: the proportion of shares held by top 20 shareholders at the balance sheet date immediately prior to the dividend reduction announcement; IDYRISK: the idiosyncratic risk measured as the standard error of the market model regression of daily stock returns over the period from day −260 to day −61 for each dividend reduction announcement; DRED: the percentage of dividend reduction; and GEARING: equity to total assets.
*Significantly different from zero at 10% level, ** significantly different from zero at 5% level and *** significantly different from zero at 1% level.

		Panel A — DREDNORP vs D DREDRP			Panel B — INDR vs FINDR		
		DREDNORP	DREDRP	MW test DREDNORP vs DREDRP	Interim Reductions (INDR)	Final Dividend Reductions (FINDR)	MW test INDR vs FINDR
Total $Assets_{t-1}$	Mean ($M)	1278.46	5728.38	1.56	1210.17	2162.14	1.70*
	Median ($M)	110.56	159.46		100.61	138.42	
$NPAT/TA_{t-1}$	Mean %	7.23	6.83	0.16	5.77	8.42	1.92*
	Median%	6.35	7.20		5.99	6.66	
$NPAT/TA_t$	Mean %	0.95	1.53	0.79	−2.37	3.91	3.15***
	Median%	3.15	4.03		2.41	4.16	
$EBITDA/TA_{t-1}$	Mean %	14.96	13.14	0.89	13.52	15.86	1.69*
	Median%	13.73	13.09		12.69	14.10	
$EBITDA/TA_t$	Mean %	9.88	7.84	1.33	7.48	11.56	3.19***
	Median%	9.99	8.43		8.65	10.95	
$\Delta NPAT/TA_t$	Mean %	−6.28	−5.30	1.53	−8.14	−4.51	2.38**
	Median%	−3.13	−1.82		−3.61	−2.36	
$\Delta EBITDA/TA_t$	Mean %	−5.08	−5.30	0.43	−6.04	−4.30	2.32**
	Median%	−3.03	−3.67		−3.99	−2.43	
MV	Mean ($M)	698.37	2758.01	1.56	644.81	1211.88	2.54**
	Median ($M)	77.18	107.11		62.12	116.86	
BM	Mean	0.85	0.88	0.97	0.89	0.83	2.04**
	Median	0.86	0.88		0.92	0.82	
TOP20	Mean %	67.61	61.10	1.83*	65.59	68.15	1.17
	Median %	71.98	63.94		68.47	74.57	
BH	Mean %	43.38	36.01	1.81*	41.14	43.94	1.18
	Median %	45.10	32.97		43.06	46.48	
IDYRISK	Mean %	2.60	2.27	1.05	2.70	2.45	1.86*
	Median %	2.24	2.32		2.40	2.14	
GEARING	Mean %	51.66	58.91	2.07**	51.80	52.88	0.52
	Median %	50.47	59.89		50.55	52.42	
DRED	Mean %	56.19	46.52	1.81*	62.46	48.84	3.65***
	Median %	50.00	40.00		59.38	40.00	
Sample Size		298	33		153	178	

industry criterion but keep the book to market criterion. We find that 22% of firms meet the criteria in (a) and (c). Finally we disregard industry and book to market criteria. We find that 6% of firms meet the criterion in (a) only. We do not find any control firms for 1% of our sample. As can be seen from Panel B of Table 4 we do not find any significant difference in median earnings ($NPAT/TA_{t-1}$) between sample firms and control firms.

As a robustness check we also use abnormal operating performance to examine the information content of dividend reductions. We define abnormal operating performance as the paired difference in earnings before interest, tax, depreciation and amortization to total assets between dividend reducing firms and control firms. We select control firms based on the following criteria in order of importance: (a) operating performance ($EBITDA/TA_{t-1}$) for the year immediately prior to the dividend reduction is between 90% and 110% of the sample firm, no reduction in dividend and no share repurchase activity during the year of the sample firm dividend reduction; (b) firms belong to the same industry classification; and (c) the book to market ratio is between 70% and 130% of the sample firm (BM). Details of the procedures employed to select the control-sample firms are given in Panel A of Table 4.

3.4. Return generating processes and test statistics

The market model (MM) is used to examine the daily abnormal returns around announcement dates. Model parameters are estimated using 200 observations, commencing 260 days prior to the event, with the Australian All Ordinaries Share Index used as the market proxy. This study uses the t-test statistic (standardized residual test statistic) to report significance levels of the price reactions. The daily returns are measured using logarithmic returns after the adjustment for dividends on ex-dates. The abnormal returns are generated for the event window: day −1 to day 1 (the day before to the day after the announcement).

Table 4
Matching procedure.
Panel A of this table provides details of the procedure employed to select control firms to calculate abnormal earnings and abnormal operating performances. Panel B provides mean and median earnings ($NPAT/TA_{t-1}$) and operating performance ($EBITDA/TA_{t-1}$) for the year prior to the dividend reductions for sample firms and control firms. Mann–Whitney test is used to test the difference in median earnings (operating performances) between sample firms and control firms.

Panel A – matching procedure to calculate abnormal earnings/operating performance

Matching Criteria	$NPAT/TA_{t-1}$	$EBITDA/TA_{t-1}$
Performance ± 10%, no reduction in dividend and no share repurchase activity during the year of the sample firm dividend reduction, same industry classification based on Global Industry Classification standard 10 industry sectors, and BM ± 30%.	181	222
Performance ± 10%, no reduction in dividend and no share repurchase activity during the year of the sample firm dividend reduction, same industry classification based on Global Industry Classification standard 10 industry sectors.	54	59
Performance ± 10%, no reduction in dividend and no share repurchase activity during the year of the sample firm dividend reduction, and BM ± 30%.	74	36
Performance ± 10%, no reduction in dividend and no share repurchase activity during the year of the sample firm dividend reduction.	19	11
No matching	3	3
Total	331	331

Panel B — $NPAT/TA_{t-1}$ and $EBITDA/TA_{t-1}$ for sample firms and control firms

		$NPAT/TA_{t-1}$	$EBITDA/TA_{t-1}$
Sample firms	Mean (%)	7.19	14.78
	Median (%)	6.38	13.62
Matched firms	Mean (%)	7.09	14.82
	Median (%)	6.50	13.61
Mann–Whitney test statistics for the difference in median earnings and operating performance between sample firms and control firms		0.27	0.07

4. Empirical evidence on information content of dividend reductions

We empirically investigate the information content of dividend reductions by examining the relation between future abnormal earnings and dividend reductions using the control sample procedure outlined in Section 3.3, above, for firms that reduce dividends without contemporaneous repurchasing activity (DREDNORP) and for firms that reduce dividends and contemporaneously engage in repurchasing activity (DREDRP), thereby increasing the internal validity of the study and avoiding potential shortcomings that can arise from not controlling for this dimension. We compare the earnings of our sample firms with control firms and calculate abnormal earnings as the difference in earnings between a sample firm and its control firm for the year of the dividend reduction, for each year of the three year periods subsequent to the dividend reduction and we also calculate the average abnormal earnings per year for the three year period after the dividend reduction. As a robustness check we also use abnormal operating performance in our empirical analysis.

4.1. Univariate results on abnormal earnings

Panel A of Table 5 provides results on abnormal earnings for the DREDNORP and DREDRP subsamples. Panel A of Table 5 indicates significantly negative abnormal earnings during the year of, and over the three year period after, the dividend reduction for firms with no repurchasing activities around dividend reductions (DREDNORP) with the mean (median) abnormal earnings of −6.17% (−2.97%) for the year after the dividend reduction, −3.16% (−1.20%) for the 2nd year after the dividend reduction, and −2.16% (−1.21%) for the 3rd year after the dividend reduction. The mean and median of average abnormal earnings per year over the three year period after the dividend reduction are −3.87% and −2.01%, respectively. As a robustness check we also examine the abnormal earnings for the subsample of DREDNORP that meet all matching criteria and find similar results which are reported in Panel C of Table 5. These results provide strong support for our hypothesis H1(a). The abnormal earnings over the three year period after the dividend reduction for firms with contemporaneous repurchasing activity (DREDRP) are statistically insignificant, supporting our hypothesis H1(b).[6] These results confirm that dividend reductions that do not have contemporaneous repurchasing activity provide information content regarding future earnings streams and show that conditioning on repurchasing status has important implications for the information content of dividend reductions.

When we use abnormal operating performance to examine the information content of dividend reductions we find that abnormal operating performances are significantly negative during the year of, and over the three year period after, the dividend reduction for DREDNORP with a mean (median) abnormal operating performance of −5.46% (−3.11%) for the year after the dividend reduction, −2.58% (−1.57%) for the 2nd year after the dividend reduction, and −3.21% (−2.03%) for the 3rd year after the dividend reduction. The mean and median of the average abnormal operating performance per year over the three year period after the dividend reduction are −3.73% and −3.26%, respectively. As a means of assessing the robustness of our results, we also

[6] We also examine the abnormal earnings for the subsample of DREDRP that meet all matching criteria and we find insignificant abnormal earnings for each year within the three year period after the dividend reduction (reported in Panel C of Table 5).

Table 5
Dividend reductions and abnormal earnings/operating performance.
Panel A of this table provides abnormal earnings as measured by AΔNPAT/TA for the year of the dividend reduction, each year of three years after the dividend reduction and average abnormal earnings per year during the three year period after the dividend reduction ($AAΔNPAT/TA_{3yrs}$). Abnormal earnings are calculated as the difference in NPAT/TA between sample firms and control firms. Panel B of this table provides abnormal operating performance as measured by AΔEBITDA/TA for the year of the dividend reduction, each year of three years after the dividend reduction and average abnormal operating performance per year during the three year period after the dividend reduction ($AAΔEBITDA/TA_{3yrs}$). Abnormal operating performance is calculated as the difference in EBITDA/TA between sample firms and control firms. Panel C provides abnormal earnings for the subsamples of DREDNORP and DREDRP that meet all the matching criteria. Panel D provides abnormal operating performance for the subsamples of DREDNORP and DREDRP that meet all the matching criteria. Wilcoxon signed rank test is used to test whether median abnormal earnings/operating performance is different from zero. Mann–Whitney test is used to test the difference in median earnings (operating performances) between DREDNORP and DREDRP. DREDNORP: firms reduce their dividends and do not repurchase shares during the year of the announcement of dividend reduction, DREDRP: firms reduce their dividends and repurchase shares during the year of the dividend reduction. Significantly different from zero at the 10% level, ** significantly different from zero at the 5% level, and ***significantly different from zero at the 1% level.

Panel A: abnormal earnings for DREDNORP and DREDRP

		$AΔNPAT/TA_t$	$AΔNPAT/TA_{t+1}$	$AΔNPAT/TA_{t+2}$	$AΔNPAT/TA_{t+3}$	$AAΔNPAT/TA_{3yrs}$
DREDNORP	Mean (%)	−4.42	−6.17	−3.16	−2.16	−3.87
	Median (%)	−2.55	−2.97	−1.20	−1.21	−2.01
	WSR	(6.92)***	(6.42)***	(3.23)**	(2.28)**	(5.09)***
	N	295	289	284	277	277
DREDRP	Mean (%)	−1.59	2.31	0.92	1.21	1.58
	Median (%)	−0.93	1.51	−1.65	0.42	−0.64
	WSR	(1.68)*	(1.03)	(0.39)	(0.76)	(0.39)
	N	33	31	29	29	29
MW test: DREDNORP vs DREDRP		1.31	3.08***	0.52	1.46	2.32**

Panel B: abnormal operating performance for DREDNORP and DREDRP

		$AΔEBITDA/TA_t$	$AΔEBITDA/TA_{t+1}$	$AΔEBITDA/TA_{t+2}$	$AΔEBITDA/TA_{t+3}$	$AAΔEBITDA/TA_{3yrs}$
DREDNORP	Mean (%)	−3.44	−5.46	−2.58	−3.21	−3.73
	Median (%)	−2.04	−3.11	−1.57	−2.03	−3.26
	WSR	(5.74)***	(5.60)***	(2.64)***	(3.30)***	(4.46)***
	N	297	292	287	275	275
DREDRP	Mean (%)	−3.24	1.50	1.31	0.77	0.98
	Median (%)	−2.13	0.98	0.24	−1.94	−0.18
	WSR	(1.98)**	(0.72)	(0.58)	(0.52)	(0.04)
	N	31	30	28	27	27
MW test: DREDNORP vs DREDRP		0.11	2.52**	1.47	0.73	2.07**

Panel C: abnormal earnings for the subsample that meet all matching criteria

		$AΔNPAT/TA_t$	$AΔNPAT/TA_{t+1}$	$AΔNPAT/TA_{t+2}$	$AΔNPAT/TA_{t+3}$	$AAΔNPAT/TA_{3yrs}$
DREDNORP	Mean (%)	−4.12	−5.27	−3.08	−2.33	−3.56
	Median (%)	−2.21	−3.01	−1.81	−1.26	−2.24
	WSR	(5.51)***	(4.69)***	(3.18)***	(2.49)**	(4.25)***
	N	158	155	153	150	150
DREDRP	Mean (%)	−2.31	2.54	1.99	1.66	2.21
	Median (%)	−0.82	1.23	−1.07	1.40	−0.32
	WSR	(1.22)	(0.97)	(0.28)	(0.80)	(0.45)
	N	23	23	22	21	21
MW test: DREDNORP vs DREDRP		1.22	2.54**	0.89	1.61	2.00**

Panel D: abnormal operating performance for the subsample that meet all matching criteria

		$AΔEBITDA/TA_t$	$AΔEBITDA/TA_{t+1}$	$AΔEBITDA/TA_{t+2}$	$AΔEBITDA/TA_{t+3}$	$AAΔEBITDA/TA_{3yrs}$
DREDNORP	Mean (%)	−3.69	−5.39	−2.24	−2.98	−3.63
	Median (%)	−2.80	−2.38	−1.48	−1.76	−2.68
	WSR	(5.20)***	(5.86)***	(1.99)**	(2.59)***	(3.57)***
	N	202	199	196	188	188
DREDRP	Mean (%)	−3.41	3.29	0.91	−0.52	1.43
	Median (%)	−2.68	1.82	0.24	−1.30	0.57
	WSR	(1.18)	(1.36)	(0.47)	(0.62)	(0.73)
	N	20	20	20	19	19
MW test: DREDNORP vs DREDRP		0.03	2.71***	1.17	0.36	1.88*

examine the abnormal operating performance for the subsample of DREDNORP that meet all matching criteria and find similar results (reported in Panel D of Table 5). The abnormal operating performance for DREDRP is statistically insignificant for each year within the three year period after the dividend reduction.[7]

Overall, we find strong support for the view that dividend reductions that are not associated with repurchases provide information regarding both future earnings and operating performance within our sample. We further explore the impact of the timing of the dividend reduction (interim versus final) on future abnormal earnings using cross sectional regression analysis, controlling for the impact of imputation tax credits in Section 4.2, below.

4.2. Franking status, abnormal earnings and dividend reductions

Further evidence regarding the association between dividend reductions and abnormal earnings is provided by regressing abnormal earnings on the percentage of reductions in dividends for the year after the dividend reductions and for the average abnormal earnings per year during the three year period after the dividend reduction. The results, which are reported in Table 6, demonstrate that there is a strong statistical association between the level of the dividend reduction and the deterioration in future earnings. This result is consistent with *H2*, outlined in Section 2, which predicts that there should be an articulation between the percentage of dividend reductions and declines in future earnings. The dummy variables DIOF (interim versus final reduction) and DUFRDR (franking status in the year prior to the dividend reduction) or percentage of franking (PERFRANK) or reduction in franking credit (RFC) do not have any significant relation with abnormal earnings. The dummy variable DREDRP is significantly positive and indicates that abnormal earnings are more unfavorable for dividend reductions that are not associated with share repurchase activity around dividend reductions and thereby confirms the findings in Section 4.1 and support our hypotheses H1(a and b). Thus dividend reductions do convey information regarding earnings declines in the future irrespective of whether the reduction takes place at the interim or final, and irrespective of whether the reductions are in franked or unfranked dividends.

5. Market reaction to dividend reductions

As a final investigation of the information content, we examine stock market reactions to dividend reductions. We analyze the stock market reaction using an event study methodology and report univariate results in Section 5.1 and the results using cross-sectional regressions in Section 5.2.

5.1. Announcement effects

Table 7 contains the results regarding the stock price reaction to dividend reductions. We report mean and median abnormal returns and the standardized residual t-tests (SRT) employing the market model for the period from the day before the announcement date to the day after (day-1 to day +1). Table 7 indicates that the 3-day mean cumulative abnormal return (CAR) surrounding the announcement of dividend reductions for the full sample is statistically significantly negative (at the 1% level) with a CAR of −3.36%, for the DREDNORP subsample it is statistically significantly negative (at the 1% level) with a CAR of −3.39%,and for the DREDRP sample it is statistically significantly negative (at the 1% level) with a CAR of −3.11%. We do not find any significant difference in price reactions as between DREDNORP and DREDRP. This evidence indicates that dividend reductions do have consistently strong pricing impacts in Australia, irrespective of the share repurchase activities around dividend reductions. We examine the impact of the timing of the dividend reductions controlling for the impact of the imputation tax credit using the cross-sectional regression analysis reported in Section 5.2, below.

5.2. Cross sectional analysis of price reactions

In this section, we examine the impacts of the reduction at the interim versus final upon the magnitude of the price reaction via a cross sectional specification controlling for the impact of the imputation tax credit. The dependent variable is the abnormal return from day −1 to day 1. The set of explanatory variables are: DRED: the percentage dividend reduction ; DUFRDR: a dummy variable that takes the value of one if the firm paid an unfranked dividend in the year t−1 and zero for a franked (full or partial) dividend in the year t−1; PERFRANK: percentage of franking in year t−1; DIOF: a dummy variable where DIOF equals 1 if the firm reduces its dividend at the interim stage and zero if the firm reduces the dividend at the final stage; RFC: reduction in franking credit per share in year t at the interim (final) dividend relative to interim (final) dividend in year t−1, standardized by the share price two days prior to the announcement; LMV: the natural logarithm of the market value one month prior to the announcement of the dividend reduction; GEARING: the gearing ratio (equity to total assets); and LBM: the natural logarithm of the book to market ratio.

The results of the cross-sectional analyses are reported in Table 8. The dividend reduction (DRED) variable has the expected sign and is statistically significant. The dummy variable DIOF has the expected sign and is statistically significant at the 5% level and is consistent with our hypothesis *H3*, that an interim dividend reduction provides a greater “shock” as compared to final

[7] We also examine the abnormal operating performance for the subsample of DREDRP that meet all matching criteria and find insignificant abnormal operating performance for each year (reported in Panel D of Table 5).

Table 6
Regression Analysis – Information content of dividend reductions and abnormal earnings.
The dependent variable is abnormal earnings for year after the dividend reduction ($A\Delta NPAT/TA_{t+1}$) in Panel A and average abnormal earnings per year during the period t+1 to t+3 ($AA\Delta NPAT/TA_{3yrs}$). Independent variables are DRED: the percentage dividend reduction; DREDRP: a dummy variable where DREDRP equals 1 if firms reduce their dividends and buyback shares during the year of dividend reduction and zero otherwise; DIOF: a dummy variable where DIOF equals 1 if the firm reduces its dividend at the interim stage and zero if the firm reduces the dividend at the final stage; DUFRDR: a dummy variable equal to 1 if the firm paid unfranked dividend in the year t−1 and zero for franked (full or partial) dividend in the year t−1; PERFRANK: the percentage of franking of dividend for the year prior to the dividend reduction; and RFC: the reduction in franking credit per share in year t at the interim (final) dividend relative to interim (final) dividend in year t−1 standardized by share price two days prior to the announcement. *Significantly different from zero at the 10% level, ** significantly different from zero at the 5% level and *** significantly different from zero at the 1% level.

Panel A – Dependent variable: Abnormal earnings in year *t+1* ($A\Delta NPAT/TA_{t+1}$)

	A1	A2	A3	A4	A5	A6	A7
Constant	0.0004	−0.0119	−0.0140	−0.0144	−0.0225	−0.0129	−0.0131
	(0.03)	(−0.90)	(−0.98)	(−0.97)	(−1.08)	(−0.87)	(−0.93)
DRED	−0.0971	−0.0895	−0.0916	−0.0930	−0.0890	−0.0828	−0.0838
	(−3.68)***	(−3.44)***	(−3.43)***	(−3.52)***	(−3.46)***	(−3.08)***	(−3.08)***
DREDRP		0.0837	0.0832	0.0824	0.0846	0.0817	0.0579
		(3.08)***	(3.06)**	(3.02)***	(3.07)***	(3.00)***	(3.00)***
DIOF			0.0073	0.0075	0.0068	0.0049	0.0050
			(0.41)	(0.42)	(0.38)	(0.27)	(0.29)
DUFRDR				0.0047		−0.0027	
				(0.21)		(−0.12)	
PERFRANK					0.0099		
					(0.46)		
RFC						−0.1054	−0.1032
						(−0.82)	(−0.93)
Adj R	0.0392	0.0604	0.0579	0.0551	0.0557	0.0586	0.0615
F statistic	14.01	11.25	7.54	5.65	5.70	4.97	6.23
p-value	0.0002	0.0000	0.0001	0.0002	0.0002	0.0002	0.0001

Panel B – Dependent variable: Average abnormal earnings during the period t+1 to t+3 ($AA\Delta NPAT/TA_{3yrs}$)

	B1	B2	B3	B4	B5	B6	B7
Constant	−0.0001	−0.0104	0.0104	−0.0110	−0.0177	−0.0093	−0.0095
	(−0.01)	(−0.82)	(−0.86)	(−0.89)	(−1.00)	(−0.75)	(−0.79)
DRED	−0.0574	−0.0510	−0.0510	−0.0530	−0.0488	−0.0416	−0.0423
	(−2.82)***	(−2.51)**	(−2.54)**	(−2.57)**	(−2.43)**	(−2.00)**	(−2.11)**
DREDRP		0.0708	0.0707	0.0698	0.0720	0.0690	0.0687
		(2.73)***	(2.75)***	(2.77)***	(2.82)***	(2.73)***	(2.68)***
DIOF			0.0001	0.0003	−0.0004	−0.0026	−0.0024
			(0.01)	(0.03)	(−0.03)	(−0.20)	(−0.20)
DUFRDR				0.0063		−0.0019	
				(0.39)		(−0.12)	
PERFRANK					0.0085		
					(0.52)		
RFC						−0.1175	−0.1159
						(−1.04)	(−1.06)
Adj R	0.0236	0.0519	0.0489	0.0464	0.0468	0.0579	0.0608
F statistic	8.70	9.71	6.45	4.87	4.91	4.91	6.15
p-value	0.0034	0.0001	0.0003	0.0008	0.0008	0.0002	0.0001

Table 7
Price Reaction to Dividend reductions.
This table reports mean and median abnormal returns and the standard residual t-tests (SRT) employing the market model for dividend reduction for the period: the day before the announcement date to day after (day-1 to day +1) for full sample and subgroups: DREDNORP and DREDRP. This table also provides parametric t-test statistics for the difference in mean abnormal returns between two sub groups: DREDNORP and DREDRP. DREDNORP: firms reduce their dividends and do not repurchase shares during the year of dividend reduction. DREDRP: firms reduce their dividends and repurchase shares during the year of dividend reduction. *Significantly different from zero at the 10% level, ** significantly different from zero at the 5% level and *** significantly different from zero at the 1% level.

	DREDNORP Versus DREDRP			
	Full Sample	DREDNORP	DREDRP	t-test : DREDNORP VS DREDRP
Mean (%)	−3.36	−3.39	−3.11	−0.59
Median (%)	−1.67	−1.62	−2.92	
SRT	(−24.60)***	(23.21)***	(−8.16)***	
Sample Size	331	298	33	

Table 8
Analysis of Price Reaction.
This table provides cross-sectional results for the dividend reductions firms. The dependent variable is three-day abnormal returns, employing the market model. Independent variables are DRED: the percentage dividend reduction; DREDRP: a dummy variable takes a value of one if firms reduce their dividends and buyback shares during the year of the announcement of dividend reduction and zero otherwise; DUFRDR: a dummy variable if the firm paid unfranked dividend in the year t − 1 and zero for franking (full or partial) dividend in the year t − 1; DIOF: a dummy variable where DIOF equals 1 if the firm reduces its dividend at the interim stage and zero if the firm reduces the dividend at the final stage; PERFRANK is the percentage of franking of dividend for the year prior to the dividend reduction; RFC: reduction in franking credit per share in year t at the interim (final) dividend relative to interim (final) dividend in year t − 1, standardized by share price two days prior to the announcement; LMV: the natural logarithm of the market value one month prior to the announcement of dividend reduction; GEARING: the gearing ratio (equity to total assets); and LBM: the natural logarithm of the book to market ratio. *Significantly different from zero at the 10% level, ** significantly different from zero at the 5% level and *** significantly different from zero at the 1% level.

	1	2	3	4	5	6	7	8	9
Constant	−0.0151 (−2.72)***	−0.0150 (−2.67)***	−0.0092 (−1.44)	−0.0097 (−1.54)	−0.0009 (−0.08)	−0.0086 (−1.235)	−0.0193 (−5.21)***	0.0002 (0.01)	0.0174 (0.83)
DRED	−0.0335 (−2.58)***	−0.0336 (−2.61)***	−0.0274 (−2.31)**	−0.0290 (−2.30)**	−0.0299 (−2.39) **	−0.0226 (−1.86)*		−0.0240 (−1.79)*	
DREDRP		−0.0007 (−0.09)	0.0004 (0.05)	−0.0005 (−0.06)	−0.0010 (−0.11)	−0.0006 (−0.07)	0.0154 (0.17)	0.0006 (0.07)	0.0023 (0.24)
DIOF			−0.0202 (−2.53)**	−0.0201 (−2.51)**	−0.0199 (−2.49) **	−0.0218 (−2.76)***	−0.0250 (−2.91)***	−0.0222 (−2.73)***	−0.0248 (−2.80)***
DUFRDR				0.0058 (0.56)					
PERFRANK					−0.0097 (−0.95)				
RFC						−0.0653 (−2.59)***	−0.0769 (−3.06)***	−0.0682 (−2.57)**	−0.0778 (−2.83)***
LMV								−0.0016 (−0.59)	−0.0005 (−0.21)
GEARING								−0.0026 (−0.12)	−0.0029 (−0.14)
LBM								−0.0047 (−0.62)	−0.0068 (−0.75)
Adj R-Squared	0.0194	0.0164	0.0308	0.0289	0.0308	0.0391	0.0326	0.0319	0.0254
F-statistics	7.53	3.76	4.49	3.45	3.62	4.36	4.71	2.56	2.43
P-value	0.0064	0.0244	0.0042	0.0088	0.0066	0.0019	0.0031	0.0142	0.0258
Sample size	331	331	331	331	331	331	331	331	331

dividend reductions. We do not find any significant impact for franking status in year t − 1 in terms of the significance of the franking dummy variable or percentage of franking. The coefficient of the variable that measures the reduction in franking credit (RFC) is statistically significantly negative and provides empirical support for the view that the market incorporates the financial or economic impact of the reduction in the franking credit in prices at the announcement date of the dividend reduction. The coefficients of LBM, LMV and the gearing ratio are not statistically significant. These results indicate that there is no difference in stock price response for large firms as compared to small firms, investment/growth opportunities do not play a significant role in determining the stock price reactions and that leverage is not associated with the magnitude of the stock price response. Overall, the market reacts negatively to dividend reductions and reacts more aggressively to interim as compared to final dividend reductions. Furthermore, the market reaction is negatively related to the reduction in imputation tax credit, thereby providing some support for a tax effect within the price reactions.

6. Determinants of the size of the dividend reduction

Firms that pay franked dividends may reduce their dividend if there is insufficient imputation credit to pass on in comparison with the previous year's level, even in situations where the management does not expect earnings to decline in future years. However, as a result of the tax preference for dividends of Australian resident investors, managers will be reluctant to reduce the franked dividend too dramatically. To examine this further we employ Tobit regressions using the percentage dividend reduction as the dependent variable to identify the factors that determine the magnitude of the dividend reduction, with a particular emphasis upon the impact of franking status, since we find some evidence for a pricing effect deriving from tax credits. The results are reported in Table 9.

We find that the franking status of the dividend for the year immediately prior to the dividend reduction, as encapsulated in the PERFRANK (percentage of franking) variable and the dummy variable DUFRDR have statistically significant impacts upon the size of the dividend reduction. That is, the higher the degree of franking prior to the dividend reduction, the lower the size of the dividend reduction which is consistent with management's reluctance to reduce dividends as enhanced by tax preferences. Prior year earnings, as measured by $NPAT/TA_{t-1}$ has a negative coefficient, indicating that firms with lower prior year earnings tend to have larger dividend reductions, other things being equal. The decline in future earnings measured as the matched difference in earnings between sample firms and control firms in year t + 1, $A\Delta NPAT/TA_{t+1}$ has statistically significant negative signs, plausibly indicating that firms facing a steeper decline in future earnings for the year after the dividend reduction tend to make deeper cuts

Table 9
Determinants of dividend reductions.
This table provides Tobit regression results. The dependent variable is DRED: percentage of dividend reduction; Independent variables are DUFRDR: a dummy variable takes value of one if the firm paid unfranked dividend in the year t − 1 and zero for franking (full or partial) dividend in the year t − 1; DREDRP: a dummy variable taked value of one if firms reduce their dividends and buyback shares during the year of dividend reduction and zero otherwise; PERFRANK: percentage of franking credit incorporated into the interim and final dividends for the year prior to the interim and final dividend reductions; IDYRISK: the idiosyncratic risk measured as the standard error of the market model regression of daily stock returns over the period from day −260 to day −61 for each dividend reduction announcement; LMV: the logarithm of the market value of the issuing firm; $NPAT/TA_{t-1}$:net profit after tax to total assets for the year before the year of the dividend reduction; $\Delta NPAT/TA_t$: changes in net profit after tax to total assets for the year of the dividend reduction; $A\Delta NPAT/TA_t$: abnormal earnings for the year of the dividend reduction; $AA\Delta NPAT/TA_{3yrs}$: average abnormal earnings during the period t + 1 to t + 3; DIOF: a dummy variable where DIOF equals 1 if the firm reduces its dividend at the interim stage and zero if the firm reduces the dividend at the final stage; and LMV: the natural logarithm of the market value one month prior to the announcement of dividend reduction. *Significantly different from zero at the 10% level, ** significantly different from zero at the 5% level, and ***significantly different from zero at the 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Constant	0.5122 (24.47)***	0.5614 (28.53)***	0.6514 (18.34)***	0.3270 (8.16)***	0.5799 (28.71)***	0.5628 (26.53)***	0.5678 (26.97)***	0.5350 (22.95)***	0.5387 (23.24)***	0.3348 (8.24)***	0.4115 (7.38)***	0.5484 (8.56)***	0.6649 (8.61)***	0.6663 (8.58)***	0.5493 (8.46)***
DUFRDR	0.1561 (3.70)***							0.1595 (3.94)***	0.1622 (4.00)***	0.0926 (2.25)**		0.1201 (3.10)***			0.1218 (3.12)***
DREDRP		−0.1050 (−1.87)*						−0.0907 (−1.71)*	−0.0897 (−1.74)*	−0.0908 (−1.75)*	−0.0879 (−1.69)*	−0.0473 (−0.94)	−0.0455 (−0.90)	−0.0509 (−1.04)	−0.0521 (−1.07)
PERFRANK			−0.1400 (−3.33)***								−0.0804 (−1.98)**		−0.1133 (−2.93)***	−0.1138 (−2.94)***	
IDYRISK				8.7291 (6.11)***						7.8808 (5.49)***	8.0260 (6.61)***	5.0987 (4.55)***	5.1550 (4.60)***	5.2400 (4.48)***	5.1600 (4.41)***
$NPAT/TA_{t-1}$					−0.9710 (−5.34)***	−0.9694 (−5.15)***	−1.0073 (−5.26)***	−0.9573 (−5.24)***	−0.9925 (−5.34)***			−0.7751 (−4.28)***	−0.7819 (−4.30)***	- 0.8025 (−4.28)***	−0.8004 (−4.27)***
$\Delta NPAT/TA_t$					−0.6616 (−3.72)***	−0.5945 (−2.92)***	−0.6303 (−3.01)***	−0.5548 (−2.63)***	−0.5872 (−2.72)***			−0.4308 (−2.24)**	−0.4361 (−2.27)**	−0.4744 (−2.38)**	−0.4691 (−2.36)**
$A\Delta NPAT/TA_{t+1}$						−0.3299 (−3.00)**		−0.3040 (−2.81)***				−0.2324 (−2.11)**	−0.2192 (−1.99)**		
$AA\Delta NPAT/TA_{3yrs}$							−0.3918 (−2.51)**		−0.3639 (−2.40)**					−0.1683 (−1.11)	−0.1945 (−1.29)
LMV												−0.0362 (−4.36)***	−0.0377 (−4.49)***	0.0372 (−4.37)***	−0.0358 (−4.23)***
DIOF												0.0659 (2.07)**	0.0672 (2.11)**	0.0671 (2.09)**	0.0659 (2.06)**
LR Chi^2	13.51	2.89	11.06	50.32	42.28	46.89	45.29	63.97	62.75	57.16	55.99	121.26	120.19	117.43	118.68
Prob > Chi^2	0.0002	0.0890	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pseudo R2	0.0610	0.0131	0.0494	0.2274	0.1910	0.2203	0.2128	0.3005	0.2948	0.2583	0.2530	0.5696	0.5646	0.5518	0.5576
Sample Size	331	331	331	331	331	320	319	320	319	331	331	320	320	319	319

in dividends, providing further support for the information content of dividend reductions. The coefficient of the average abnormal earnings over the three year period has statistically negative signs in models 7 and 9. However, it becomes statistically insignificant after controlling for firm size (LMV) and risk in models 14 and 15.

The coefficient of idiosyncratic risk is significantly positive, indicating that firms with high idiosyncratic risk tend to make steeper reductions in dividends reflecting lower quality, other things being equal. Finally the coefficient of LMV (logarithm of the market value of the firm) is negative, denoting that large firms tend to make lower reductions in dividends as compared to smaller firms, ceteris paribus. We also find that the percentage of dividend reduction is larger for firms reducing dividends at the interim rather than for those delaying the reduction to the final stage.

7. Decision to reduce dividends at the interim stage rather than final stage

Unlike US companies, Australian firms pay dividends twice a year. Faced with declining future prospects, managers have the choice of reducing dividends at the interim level or postponing the reductions to the final dividend stage. During the period of announcement of interim dividends both managers and outside investors have incomplete information regarding the earnings of the firm during the current year to date (that is, only unaudited interim figures are available, containing a number of estimated figures). We do not find any support for the existence of differing information contents for dividend reductions at the interim and final stages regarding future earnings or operating performance. However, we do find that the market reacts more negatively to the dividend reduction at the interim stage rather than the final stage. Therefore, we examine the factors that determine the decision to reduce dividends at the interim level rather than delay the reduction to the final stage, using logistic regressions. The results are reported in Table 10.

The coefficients of prior year earnings, changes in earnings and firm size are significantly negative. The coefficients of the risk and book to market ratio variables are significantly positive, but only when they are used as standalone independent variables. The coefficients on the abnormal earnings variables are statistically insignificant, indicating that declines in future earnings do not influence the decision to reduce the dividend at the interim stage rather than delay the reduction to the final stage. Overall, firms experiencing lower levels of prior year earnings, steeper declines in current year earnings, with smaller firm sizes tend to reduce their dividends at the interim stage rather than delay the reduction to the final dividend declaration. The impacts of prior and current year earnings are consistent with managers resorting to interim reductions due to the force of current circumstances which is consistent with hypothesis *H4*.

Table 10
Decision to reduce dividend at the interim rather delay to the final stage.
This table provides logistic regression results. The dependent variable is DIOF where DIOF equals 1 if the firm reduces its dividend at the interim stage and zero if the firm reduces the dividend at the final stage. Independent variables are $NPAT/TA_{t-1}$:net profit after tax to total assets for the year before the year of the dividend reduction;; $\Delta NPAT/TA_t$: changes in net profit after tax to total assets in the year of the divided reduction; $A\Delta NPAT/TA_{t+1}$: abnormal earnings for the year after the dividend reduction; $AA\Delta NPAT/TA_{3yrs}$: average abnormal earnings during the period t + 1 to t + 3; a dummy variable DREDRP where DREDRP equals 1 if firms reduce their dividends and buyback shares during the year of the announcement of dividend reduction and zero otherwise; IDYRISK: the idiosyncratic risk measured as the standard error of the market model regression of daily stock returns over the period from day −260 to day −61 for each dividend reduction announcement; LMV: the natural logarithm of the market value one month prior to the announcement of dividend reduction; and LBM: the natural logarithm of the book to market ratio. Significantly different from zero at the 10% level, ** significantly different from zero at the 5% level, and ***significantly different from zero at the 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.0654	0.0194	0.0016	−0.0123	0.4727	0.4600	0.6098	−0.0560	−0.4749
	(0.46)	(0.14)	(−0.01)	(−0.09)	(1.06)	(1.03)	(2.04)**	(−0.45)	(−2.22)**
$NPAT/TA_{t-1}$	−2.9921	−4.9890	−4.8065	−4.7484	−5.0510	−4.9469			
	(−2.35)**	(−3.55)***	(−3.43)***	(−3.32)***	(−3.40)***	(−3.30)***			
$\Delta NPAT/TA_t$		−3.2879	−3.3090	−3.0638	−3.1348	−2.8992			
		(−3.24)***	(−2.98)***	(−2.81)***	(−2.88)***	(−2.70)***			
$A\Delta NPAT/TA_{t+1}$			0.4172		0.5017				
			(0.55)		(0.63)				
$AA\Delta NPAT/TA_{3yrs}$				−0.1219		0.0333			
				(−0.12)		(0.03)			
DREDRP					0.3014	0.3266			
					(0.75)	(0.82)			
LMV					−0.1299	−0.1279	−0.1644		
					(−1.87)*	(−1.84)*	(−2.73)**		
LBM					−0.1882	−0.1761		0.3871	
					(−0.63)	(−0.59)		(1.70)*	
IDYRISK					3.4660	3.0559			12.6134
					(0.41)	(0.36)			(1.79)*
LR Chi^2	5.81	17.77	14.87	14.49	19.90	19.35	7.82	2.63	2.65
Prob > Chi^2	0.0159	0.0001	0.0019	0.0023	0.0058	0.0072	0.0052	0.1047	0.1036
Pseudo R^2	0.0127	0.0389	0.0337	0.0330	0.0451	0.0440	0.0171	0.0058	0.0058
Sample Size	331	331	331	319	320	319	331	331	331

8. Conclusion

In this paper we examine the information content of dividends by analyzing the relation between dividend reductions and future abnormal earnings together with the associated stock price reactions. We find that, firms without contemporaneous repurchasing activity do experience negative abnormal earnings during the year of and during each year of the subsequent three-year period after the dividend reductions. We also find support for this conjecture when we used abnormal operating performance instead of abnormal earnings. The tax status of the prior dividend or the reduction in franking credit or the timing of the dividend reduction (interim versus final) does not have any impact upon the information content of dividend reductions regarding future earnings prospects.

The stock price reaction to dividend reductions is negative and is an increasing function of the size of the reduction, which is consistent with general information content predictions. Interim reductions produce stronger negative abnormal returns than do final dividend reductions. That is, firms reduce their dividends at the interim rather than delay the reduction to the final stage when they are in more parlous states; the immediacy of the dividend reduction is likely responsible for the stronger market reaction. Moreover, we find that the market ignores the tax status of the prior dividend in reacting to dividend reductions but that it incorporates the reduction in franking credit at the announcement of dividend reduction in prices.

Overall, our study shows that dividend reductions that are not associated with contemporaneous share repurchase activities do have "information content," that is, they provide (negative) information regarding future earnings prospects. This evidence shows that conditioning on repurchasing status has important implications for the information content of dividends. While the tax system in Australia differs from that in the U.S., we find that the tax dimension has pricing implications rather than generating information regarding future earnings prospects in Australia. Moreover, the market reacts more aggressively to interim dividend reductions. This demonstrates that the information content of dividends depends upon institutional features that vary internationally and focusing solely on US data restricts the external validity of empirical studies on information content of dividends.

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