Ex-Dividend Day Behaviour of Australian Share Prices
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Australian Journal of Management 1986 11: 139
DOI: 10.1177/031289628601100202

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EX-DIVIDEND DAY BEHAVIOUR
OF AUSTRALIAN SHARE PRICES

by

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Terry Walter ‡

Abstract:
In North America, on the day a stock has first been quoted ex-dividend, its price has tended to fall by less than the amount of the dividend. Australian dividends likewise have been discounted, by about 25% relative to capital gains. Explanations for the North American discount have included higher taxes on dividends than on capital gains, but this explanation begs questions of marginal transaction costs, time lags embedded in arbitrage and the fact that the tax positions of Australian shareholders are more complex than a simple tax-driven preference for capital gains would suggest. The anomalous share price behaviour extends before and after the ex-dividend day, and has implications for time-related anomalies observed for the market as a whole.

Keywords:
DIVIDEND; EX-DIVIDEND BEHAVIOUR; AUSTRALIAN SHARE PRICES.

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We wish to acknowledge the research assistance of Charles Chin and Loh Hwa Tin. Dividend and capitalisation change data were made available to us by the Centre for Research in Finance at the Australian Graduate School of Management. The Sydney Stock Exchange Ltd provided up-to-date information on the Statex-Actuaries Price and Accumulation Indexes.

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1. Introduction

Recent changes to the Australian income tax law have again focused attention sharply on the sharemarket trade-off between dividends and capital gains. Australia is to get a dividend imputation system, whereby companies will be taxed at the company tax rate on all dividends they pay. Assuming the proposed 49% company tax rate is introduced, for each $51 of eligible dividends he receives, a taxpaying shareholder will be assessed $100 in income and credited with $49 tax paid.

Some have claimed the changes herald a new era for equity investment\(^1\) and that the "strong" sharemarket performance which followed the Treasurer's September, 1985 statement can be explained, at least partly, by his proposals.

We do not address this question directly. But we do address the question of the dividend-capital gain tradeoff, to the extent that it is manifest in the ex-dividend day behaviour of Australian share prices.

The most common finding in North America is that share prices fall by less than the amount of the dividend on the day they are first quoted ex-dividend (XD). Explanations include higher tax rates on dividends than on capital gains, investors or floor operators being "caught asleep" and errors in identifying the XD day.

If the tax rate is higher for dividends than for capital gains and if the marginal investor is indifferent to the form of his after-tax income (that is, whether it be in the form of dividends or capital gains), then a before-tax preference for capital gains should be apparent when share prices fall by less than the amount of the dividend. Kalay (1982) models the relationship clearly.

The difficulty with this argument is that it glosses over questions of transaction costs, time lags that would be embedded in arbitrage operations [cum-dividend (CD) and XD trades are sequential in time] and the fact that the tax positions of investors are more complex than a simple tax-driven preference for capital gains would suggest. These issues are explored further in our literature review (Section 2) and our sketch of the Australian institutional background (Section 3).

The other two explanations can be dismissed readily. Although there are no doubt cases when the floor operator or the investor could overlook the fact that a share is quoted XD,\(^2\) they are hardly likely to be common or pervasive events, partly because of the system safeguards\(^3\) but more importantly because of the automatic safeguard of natural selection in a competitive environment. We protect our experiment against the third explanation, errors in XD dates, in ways which rule out the possibility of data errors driving our results.

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3. Computer-based quote screens in sharebrokers' offices and elsewhere provide XD flags against shares traded XD. Flags are also visible on the trading floors of the stock exchanges.

- 140 -
There is a rational reason for discounting dividends on the XD day: typically dividends are not paid until a few weeks later. At most the discount would be of the order of 1%, which is much less than the 20 to 25% discount we observe.

Data issues are explored in Section 3. We accessed the Centre for Research in Finance at the Australian Graduate School of Management (AGSM/CRIF) database, which includes information on 7,376 dividends paid between January, 1974 and December, 1984.4

Results from the tests we conduct on drop-off ratios (the drop-off ratio is the ratio of the CD price less the XD price, to the dividend amount) and on rates of return (calculated by adding back the full dividend to the XD price) are summarised in Section 4. Their implications for market anomalies are explored in Section 5. We conclude with Section 6.

2. Prior Evidence

Early research, by Campbell and Beranek (1955) and Durand and May (1960), documents the size of the average price decline on the XD day, relative to the dividend amount. They report drop-off ratios that do not differ greatly from one. By contrast, Elton and Gruber (1970) estimate the drop-off ratio averages 0.78 for 4,148 observations between April 1966 and March 1967, which implies a marginal income tax rate for investors of about 35%. Dividend yield (and payout ratio) is positively related to the drop-off ratio. Elton and Gruber (1970, p.73) conclude:

The close relationship between both measures of a firm's dividend policy and the implied stockholder bracket suggest that M&M were right in hypothesising a "clientele effect".

Kalay (1982) argues that the marginal tax rate of investors cannot be inferred from the dividend drop-off ratio and that any departure of the dividend drop-off ratio from one is bounded by the transaction costs of traders able to arbitrage. From 2,540 U.S. dividends paid in the same period studied by Elton and Gruber, Kalay estimates the drop-off ratio is not significantly different from one. The drop-off ratio is, however, related to dividend yield.

Eades et al (1984) repeat the XD day experiment with a variety of samples. Over the period 1962 to 1981, they find strong support for the hypothesis of an XD day premium (equivalent to a market-adjusted drop-off ratio of less than one) for the total period and the three sub-periods prior to the introduction of negotiated commissions in April, 1975. Results for April, 1975 and later generally favour the null of no XD day premium, which is consistent with a significant drop in effective transaction costs. Taxable preferred stock dividends are priced as if dividends were taxed at a lower rate than capital gains, non-taxable cash distributions are

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4. Unfortunately applicable price data required for this study are unavailable for many of them (refer Section 4).
found to be priced as if they impose negative tax on the recipients, while non-taxable stock dividends are priced on XD days if they were taxable. Their results thus cast doubt on the tax interpretation of XD day pricing behaviour.

Eades et al extend their analysis to examine the pricing behaviour for five days on each side of the XD day. They report (4):

abnormal returns are neither confined to the ex-dividend day nor are they confined to taxable distributions by common stocks. Indeed all samples reveal anomalous return behaviour during the ex-dividend period... (and) suggest that the tax interpretation... is inconsistent with the results of the ex-dividend day experiment.

Noti (1977) is the only published Australian study in this vein. He collected share price data on 36 XD days for four companies. Noise in the data makes it difficult to draw any reliable conclusions from such a small sample.

3. Institutional Background

The income tax positions of Australian shareholders who received dividends and realised capital gains and losses between 1974 and 1984, included all four combinations of dividends or capital gains being taxed or not. Some of Australia's largest investors, such as exempt superannuation funds, paid no income tax at all. Share traders, including sharebrokers, were taxed on dividends and realised capital gains, but could deduct realised capital losses. Personal investors paid tax on dividends, but escaped tax on realised capital gains if the shares were held for at least a year. Taxpaying financial institutions, automatically classed as share traders for tax purposes, were taxed on realised capital gains, but as companies they were eligible for the dividend rebate.

From 1974 until their deregulation in April, 1984, brokerage rates were fixed by agreement among the sharebrokers. Brokerage plus stamp duty averaged about three per cent for an order worth $5,000; 2.5% for $15,000; 2% for $50,000; 1.4% for $250,000; 1.25% for $500,000; and 1% for $1 million. These "one-way" rates could have been halved for "round-trips" completed within a month, as might be the case with arbitrage operations. Even so, a round trip buying CD and selling XD could have consumed a large proportion of the dividend, as the ratio of the dividend amount to the CD price averaged 3.5% over the period 1974 to 1984.

5. Ball et al (1979) take a different approach.
6. A handy reference is Table 17.1 in Bruce et al (1983).
7. A resident public company for tax purposes is entitled to a rebate on all dividends included in its taxable income. The way the rebate is calculated generally means the dividend is tax free. In fiscal 1982/83 only, Australian resident individual shareholders received a rebate on up to $1,000 of dividends included in their taxable incomes.
8. The fee schedule was published in the exchanges' listing manual.
It is a moot point, however, whether transaction costs of this order are relevant at the margin. Brokers who arbitrage recoup their own fees, and for them the appropriate brokerage component of the marginal transaction cost is surely less than the scheduled fee. 9 Other investors may be rearranging their portfolios for reasons unrelated to XD price behaviour. For them, the relevant marginal transaction cost could be negligible.

In sum, anything seems possible. At the margin, dividends could have been preferred to capital gains for tax reasons, but the reverse could easily be true. And transaction costs might or might not have mattered.

4. Data

Our company names, dividend amounts and XD dates come from the AGSM/CRIF data base. Our data set includes 7,376 dividends, although many of them, typically 50 to 60%, can not be used because the required share price data are unavailable. The 7,376 dividends exclude all known cases where the basis of quotation was changed [e.g., where the shares were quoted XB (ex-bonus) or XR (ex-rights)] within the experimental period, which we define as the two weeks centred on the XD day.

There is no reliable, machine-readable data base which contains daily prices of Australian shares for this period. Our prices were taken from quotation sheets issued by the stock exchanges. All price changes were filtered and absolute changes greater than 10% of the CD price were verified. We verified the XD dates against the flags on the quotation sheets and at the same time checked for any other changes in the basis of quotation that could have been missed by our data sources. This was done because our study is sensitive to data errors: XD date errors induce a bias towards a drop-off ratio less than one (an error rate of 10% in the XD dates could lead us to conclude, erroneously, that dividends are discounted by 10%); and including XB or XR prices could bias our results the other way if the dilution effect of the new issue is missed.

We use the Statex-Actuaries Accumulation Index (SAAI) to measure the market return. 10 We recomputed the index to allow for daily reinvestment of the full cash proceeds from any dividend or the sale of any rights etc. It may seem odd that we calculate the market index by assuming dividends are not discounted, when our results show they almost certainly are. However, we should point out (a) although XD dates do cluster, they are nevertheless spread out, over time, for the 50 companies in the index, (b) any bias will tend to be marginal, to overstate the market return and to understate a share’s market-adjusted return (equivalently, to

9. From the enquiries we made in June, 1985, processing a transaction between clients of two different sharebrokers requires preparing at least 20 pieces of paper.
10. The SAAI was not calculated on some public holidays in New South Wales when trading did take place interstate. Corrected index values were supplied by The Sydney Stock Exchange.
overstate the drop-off ratio), (c) the SAAI has a bias towards larger companies and therefore a slight bias towards understating the market return (Brown et al 1983) and (d) in any event, our conclusions are relatively insensitive to whether or not we adjust for market movements.

5. Results

Our results are summarised in Table 1, which is compact and requires elaboration.

Table 1 covers all fiscal years, that is, 1973/74 to 1984/85. Results are presented for continuously compounded rates of return—the natural logarithm of the price relative, \((PXD + Div)/PCD\), where \(PXD\) and \(PCD\) are the XD and CD prices—and for the drop-off ratio \((PCD - PXD)/Div\), both with and without market adjustments.\(^{11}\) To check on the sensitivity of our results to data errors, results are presented for \(PCD\) being the last sale on (a) the day before and (b) the week before the XD day.\(^{12}\) For each variable, we report distributional statistics (mean, median, first and third quartiles), frequency counts, the \(t\)-statistic and the probability of observing it under the appropriate null hypothesis (population mean return is zero; population mean drop-off ratio is one) and selected estimates from the Ordinary Least Squares cross-sectional regression of the deflated price change \((PCD - PXD)/PCD\) on the deflated dividend amount \(Div/PCD\). The regression coefficient of the dividend variable, the coefficient's standard error of estimate and the proportion of explained variance, are the three we report. There are many connections between the results in Table 1: they are far from being independent and some combinations are no more than slightly different ways of looking at the same basic phenomenon.\(^{13}\)

Whichever way we look at it, Table 1 contains clear evidence that Australian share prices drop by less than the amount of the dividend when they are quoted XD, and the difference is statistically significant. The regression estimate, using market-adjusted daily data, is that the drop-off averages 77% of the dividend. The \(t\)-statistics are "large" by any standard; a non-parametric test (based on say the rate of return frequencies \(N < 0\) and \(N > 0\)) leads to the same conclusion, that there is only the remotest possibility of observing the results by chance if the appropriate null hypothesis were true.

\(^{11}\) All prices are for the last sale on the day (see Kalay 1982) as opening prices and index values are unavailable. Returns are adjusted by subtracting the continuously compounded rate of return on the SAAI. The drop-off ratio is adjusted by multiplying the CD price by the ratio of the SAAI on the XD date to its value the day (or week) before.

\(^{12}\) We also studied the two weeks centred on the XD date. The results are closely similar to those reported in Table 1.

\(^{13}\) The slight differences between the market-adjusted frequency counts, for the rate of return and the drop-off ratio, are due to the slightly different natures of the two market adjustments (see fn.11).
Table 1
Summary of Results: Rates of Return\(^a\) and Dividend Drop-Off Ratios, 1974 to 1984.

<table>
<thead>
<tr>
<th>Rate of Return</th>
<th>Drop-Off Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Adj.</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>(a) Daily Price Data</td>
<td></td>
</tr>
<tr>
<td>No Adj.</td>
<td>0.73</td>
</tr>
<tr>
<td>Mkt Adj.</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>0.68</td>
</tr>
</tbody>
</table>

Regression:\(^b\)
- beta \* 0.845 0.772
- std err beta \* 0.028 0.28
- r-squared \* 0.23 0.21

|           | No Adj.       | Mkt Adj. |
|           | Mean          | Median   | 1st Quartile | 3rd Quartile | t-statistic | t-probability | N<0 | N=0 | N>0 | N |
| (b) Weekly Price Data |               |          |              |              |             |              |      |     |     |   |
| No Adj.       | 1.39          | 1.04     | -0.99        | 16.04        | 1.000       |               | 998  | 196 | 1,749 | 2,943 |
| Mkt Adj.     | 1.06          | 0.90     | -1.41        | 12.77        | 1.000       |               | 1,148|     |         | 2,913 |
|               | 0.46          | 0.67     | 1.33         | -6.94        | 0.000       |               | 1,749| 196 |         |       |
|               | 0.59          | 0.72     | 1.47         | -6.35        | 0.000       |               | 1,763|     |         |       |

Regression:\(^b\)
- beta \* 0.645 0.639
- std err beta \* 0.04 0.05
- r-squared \* 0.04 0.05

Notes:

a. Holding period is from the last CD sale one trading day/week before the XD day until the last sale on the XD day.

b. The regression is an Ordinary Least Squares regression of the CD price less the XD price (deflated by the CD price) on the dividend amount (also deflated by the CD price).
Table 1 contains evidence of skewness in the distributions (the mean drop-off ratio is less than the median in all cases) although we did not test specifically for skewness; and the data are noisy (note the inter-quartile range relative to the median). We collected weekly data to try to avoid a downward bias in the drop-off ratio due to XD date errors. Interestingly the bias, if there is one, goes the other way. However the weekly data, as we would expect, are more noisy than the daily data (compare the lower t-statistics and proportions of variance explained by the regression, or the inter-quartile ranges). For this reason we prefer to concentrate our discussion on the results from the daily data.

It makes little difference to the tenor of the results whether or not we adjust for market movements. The reason is simple enough: dividends, as we have already noted, are most often paid half-yearly and given the history of dividend yields and the (daily) return on the market since January 1974, the dividend is the dominant component of the XD day return. It does, as we expect, make more difference with a longer holding period. For example, the mean and median drop-off ratio is more sensitive to market adjustments for weekly than for daily data.

Table 2 gives selected statistics, for the drop-off ratio, by fiscal year (July 1 to the next June 30) after adjustment for market effects. The measures of central tendency fluctuate about 0.8. We note, in particular, that deregulation of brokerage rates in April 1984 had no obvious impact on the drop-off ratio in 1984/85. In every year the drop-off ratio for an individual share was less than one more often than it was greater than one, which suggests that dividends have been discounted relative to capital gains throughout the experimental period.

Eades et al (1984) examine the rate of return for five days on each side of the XD day. Since we had collected prices on the fifth day before and after XD day, we also could examine returns over the same 5-day periods. Table 3 reports selected statistics for the market-adjusted, continuously compounded rate of return over four adjacent holding periods: day $t-5$ to day $t-1$; day $t-1$ to day $t$ (the XD day); day $t$ to day $t+1$; and day $t+1$ to day $t+5$. There is clear evidence in Table 3 that positive returns, in excess of the market, occur before and after the XD day, though it appears that, in Australia, they peak on the XD day itself. Our finding differs from that of Eades et al, who report that “for all but the stock dividends and splits sample, the absolute value of the ex-day excess returns are smaller than the day +1 or the day −1 returns or both” (1984, p.21).

Elton and Gruber (1970) found the dividend drop-off ratio declined with the dividend yield, consistent with the clientele view. Lakonishok and Vermaelen (1983) and Booth and Johnson (1984) did not find the relationship in Canada.

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14. The ratio of the dividend amount to the CD price averaged 3.5% over all years. The average peaked in fiscal 1974/75 (at 4.4%). Its lowest value was 2.8%, in 1984/85.

15. In 1984/85 the mean drop-off ratio did increase (to 0.97) but all other indicators (median, regression coefficient, frequency counts) are consistent with a drop-off ratio less than one; see Eades et al (1984).
Table 2
Drop-Off Ratio Statistics by Fiscal Year (July 1 to June 30), 1974-1985; Holding Period is One Trading Day; Adjusted for Market Movements

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Mean</th>
<th>Median</th>
<th>Regression</th>
<th>SE(B)</th>
<th>N&lt;1</th>
<th>N&gt;1</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>.85</td>
<td>.83</td>
<td>.81</td>
<td>.12</td>
<td>92</td>
<td>54</td>
<td>146</td>
</tr>
<tr>
<td>1975</td>
<td>.72</td>
<td>.71</td>
<td>.90</td>
<td>.10</td>
<td>154</td>
<td>68</td>
<td>222</td>
</tr>
<tr>
<td>1976</td>
<td>.85</td>
<td>.87</td>
<td>.84</td>
<td>.08</td>
<td>173</td>
<td>106</td>
<td>279</td>
</tr>
<tr>
<td>1977</td>
<td>.81</td>
<td>.86</td>
<td>.79</td>
<td>.06</td>
<td>198</td>
<td>102</td>
<td>300</td>
</tr>
<tr>
<td>1978</td>
<td>.83</td>
<td>.90</td>
<td>.97</td>
<td>.08</td>
<td>184</td>
<td>126</td>
<td>310</td>
</tr>
<tr>
<td>1979</td>
<td>.79</td>
<td>.88</td>
<td>.85</td>
<td>.10</td>
<td>201</td>
<td>133</td>
<td>334</td>
</tr>
<tr>
<td>1980</td>
<td>.77</td>
<td>.83</td>
<td>.51</td>
<td>.11</td>
<td>205</td>
<td>131</td>
<td>336</td>
</tr>
<tr>
<td>1981</td>
<td>.55</td>
<td>.78</td>
<td>.89</td>
<td>.11</td>
<td>190</td>
<td>122</td>
<td>312</td>
</tr>
<tr>
<td>1982</td>
<td>.74</td>
<td>.82</td>
<td>.92</td>
<td>.14</td>
<td>134</td>
<td>71</td>
<td>205</td>
</tr>
<tr>
<td>1983</td>
<td>.76</td>
<td>.82</td>
<td>.80</td>
<td>.10</td>
<td>127</td>
<td>77</td>
<td>204</td>
</tr>
<tr>
<td>1984</td>
<td>.52</td>
<td>.74</td>
<td>1.08</td>
<td>.10</td>
<td>170</td>
<td>77</td>
<td>247</td>
</tr>
<tr>
<td>1985</td>
<td>.97</td>
<td>.85</td>
<td>.83</td>
<td>.27</td>
<td>68</td>
<td>41</td>
<td>109</td>
</tr>
<tr>
<td>All</td>
<td>.68</td>
<td>.84</td>
<td>.77</td>
<td>.03</td>
<td>1,904</td>
<td>1,100</td>
<td>3,004</td>
</tr>
</tbody>
</table>

Note: a. Regression “Beta” and “SE(B)” refer to the coefficient of the dividend variable and its standard error in the OLS regression of the deflated price change \((PCD - PXD)\) on the deflated dividend amount. The CD price, \(PCD\), is the deflator.


We replicate the Elton and Gruber experiment but on a daily basis, to minimise the impact of shifts in dividend yields over time. The price we pay is a coarser test, because of data sparsity. Our test is a pair-wise comparison between shares quoted XD on the same day. The clientele effect predicts that the drop-off ratio is lower for the share with the lower yield, a prediction which, under the most favourable interpretation of Table 4, is only weakly confirmed by our daily data and is rejected by the weekly data. For example, Table 4 reports a total of 1,924 cases that support the clientele effect and 1,895 that do not (if we ignore the 177 cases where the drop-off ratios were equal).\(^{16}\)

In sum, then, we find evidence that dividends were discounted about 20 to 25%, relative to capital gains, in Australia over the period 1974 to 1984, but any

\(^{16}\) The results in Table 4 are calculated without adjusting for market effects. The corresponding market-adjusted numbers are: for daily data, 2,052 v. 1,919; for weekly data, 1,811 v. 1,869.
Table 3
Selected Statistics for the Market-Adjusted, Continuously Compounded Rates of Return (%) for Four Adjacent Holding Periods, All Years

<table>
<thead>
<tr>
<th>Holding Period (day (t) is the XD day)</th>
<th>Statistic</th>
<th>((t-5, t-1))</th>
<th>((t-1, t))</th>
<th>((t, t+1))</th>
<th>((t+1, t+5))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>(0.41)</td>
<td>(0.66)</td>
<td>(0.21)</td>
<td>(0.21)</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>(0.26)</td>
<td>(0.46)</td>
<td>(0.11)</td>
<td>(0.10)</td>
<td></td>
</tr>
<tr>
<td>1st Quartile</td>
<td>(-1.68)</td>
<td>(-0.55)</td>
<td>(-0.88)</td>
<td>(-2.00)</td>
<td></td>
</tr>
<tr>
<td>3rd Quartile</td>
<td>(2.34)</td>
<td>(1.81)</td>
<td>(1.28)</td>
<td>(2.24)</td>
<td></td>
</tr>
<tr>
<td>(t)-statistic</td>
<td>(6.03)</td>
<td>(14.81)</td>
<td>(4.92)</td>
<td>(3.03)</td>
<td></td>
</tr>
<tr>
<td>(t)-probability</td>
<td>(1.000)</td>
<td>(1.000)</td>
<td>(1.000)</td>
<td>(0.999)</td>
<td></td>
</tr>
<tr>
<td>(N&lt;0)</td>
<td>1,527</td>
<td>1,108</td>
<td>1,357</td>
<td>1,543</td>
<td></td>
</tr>
<tr>
<td>(N=0)</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>(N&gt;0)</td>
<td>1,806</td>
<td>1,896</td>
<td>1,582</td>
<td>1,642</td>
<td></td>
</tr>
<tr>
<td>(N)</td>
<td>3,333</td>
<td>3,004</td>
<td>2,944</td>
<td>3,189</td>
<td></td>
</tr>
</tbody>
</table>

There is evidence linking the discount to the dividend yield is at best very weak.

6. Implications For Market Anomalies

Figure 1 displays the average rate of return on the Statex-Actuaries Accumulation Index (SAAI) by day-of-the-week. Because XD days are concentrated on Mondays and to a lesser extent on Fridays, and given the drop-off ratio is on average less than one, we would expect a higher average return on Mondays and Fridays, other things being equal. We do not find that to be so and the puzzle, in Figure 1, is why.

There is evidence in Figure 1 of an anomalous day-of-the-week effect, as French (1980) and Keim and Stambaugh (1984) document for the U.S. and Jaffe and Westerfield (1985) show is present also in Japan, Canada, the United Kingdom and Australia. But the strength of this effect is masked by the concentration of

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17. The percentage of XD dates, by day-of-the-week (Monday to Friday) are 45, 11, 10, 15 and 19. The corresponding percentages for capitalisation changes are 38, 15, 14, 16 and 17.
18. Although irregular holding periods (due to long weekends or mid-week holidays) are excluded from Figure 1, their inclusion does not alter the picture. At a superficial level, Figure 1 suggests investors should sell late on a Friday and buy late on a Tuesday. Ball and Bowers (1986) have also investigated the day-of-the-week phenomenon.
19. Jaffe and Westerfield (1985) calculate their returns as the percentage change in the SAAI from one day to the next. Our results are corrected for known errors in the published index. They exclude irregular holding periods, are based on daily reinvestment of dividends and the proceeds from rights issues and other entitlements, and are expressed in continuously compounded form. Nevertheless our results exhibit the same broad pattern as those of Jaffe.
Table 4

Frequency with which the Drop-Off Ratio of a Lower Yielding Security
was less than, Equal to or Greater than the Drop-Off Ratio
of its Higher Yielding Pair; Comparison is for Shares QuotedXD on Same Day

<table>
<thead>
<tr>
<th>Year</th>
<th>Daily Data</th>
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XR dates (see fn.17) and the suspicion that rights adjustments can bias indexes in subtle ways (O’Brien and Young 1985).

Now consider the index seasonality question which Officer (1975) studies. Officer rejects a dividend explanation of market index seasonalities. Yet XD dates are concentrated in March-April and October, periods in which the average return on the SAAI is among the highest.20 We wonder if the XD date concentration also has complicated measurement of the so-called “January effect” (see, for example, Brown et al 1983).

Figure 2 explores the day-of-the-month phenomenon. Ariel (1983) reports anomalously high returns for U.S. stocks beginning with the last trading day of the month and continuing for the next nine days; and anomalously low returns in the previous nine days. We find a similar result (possibly beginning a day earlier), although our data are more limited in scope than his. But what causes the anomaly?

There is no simple relationship between the concentration of XD, XB and XR dates, and anomalous returns. The peaks in the XD and XB/XR date concentrations and Westerfield.

20. A third of the XD-dates are in March-April and a fifth are in October.
are respectively days $-9$, $-4$, 5 and 6 for dividends, and days $-4$ and 1 for capitalisation changes. Index returns on average are negative on days $-9$ and $-4$, less than the global mean on day 1, not much different from the mean on day 5, and about zero on day 6.

7. Summary

We find clear evidence that the dividend drop-off ratio in Australia is significantly less than one. Our best guess is that prices drop, on average, by about 75 to 80\% of the dividend. The extent of the drop-off is largely unrelated to the dividend yield.

Given the wide difference in the tax status of Australian shareholders and the irrelevance of transaction costs for portfolio investors who are rebalancing for other reasons, we are not prepared to argue that the discounting is tax-induced. But it does exist, and it probably interacts with other puzzling anomalies which so far defy explanation.

It will be interesting to see what changes, if any, occur in the behaviour of share prices around ex-dividend dates if the Commonwealth government introduces the proposed new income tax regime. We might have to wait at least until July, 1987, to find out.

References

Ariel, R.A., 1983, A monthly effect in stock returns, unpublished manuscript, University of Chicago, Graduate School of Business.


O'Brien, J.R. and I.C. Young, 1985, Rates of return on rights and shares, unpublished manuscript, Macquarie University.