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Paper Title: AASB138: Catalyst to changes in managerial decisions and reduced R&D spending?

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AASB 138: Catalyst to changes in managerial decisions and reduced R&D spending?

Abstract

The Australian accounting standard for research and development (R&D) effective from 1 January 2005 (AASB138) contains more stringent requirements regarding the capitalisation of R&D spending than its predecessor (AASB 1011). The majority of R&D spending now has to be expensed immediately. This affects earnings significantly.

Investment in R&D is critical in maintaining competitive advantage and increases a firm's probability of survival. However, prior research found companies sacrifice long-term value to smooth earnings and that managers cut R&D spending in response to target-driven earnings pressures. Sacrificing long-term value and returns in pursuit of short-term returns is referred to as short-termism.

It is possible that AASB 138 could have discouraged managers to invest in R&D activities and that they may have chosen to reduce R&D spending as a means to manage earnings and meet expected profits. This study investigated these issues using financial data of 31 Australian listed firms for financial years from 2001 to 2010. A regression model was used to ascertain if short-termism affected R&D spending. Research intensity ratios were also calculated to determine trends in R&D spending.

The study found a marked increase in the significance of short-termism in explaining changes in R&D of companies that capitalised R&D in accordance with AASB 1011. Furthermore, the median research intensity ratio of companies that capitalised R&D under AASB 1011 declined almost three times that of companies that expensed R&D after the introduction of AASB 138. The study's findings suggest that AASB138 could have been a catalyst to changes in managerial decisions in pursuit of short-termism that resulted in reduced R&D spending as a means to manage earnings.

Introduction

The Australian Financial Reporting Council announced in July 2002 to adopt the IFRSs. Subsequently, the Australian Accounting Standards Board issued the Australian equivalent standards (AIFRS) of the IFRS. As of 1 January 2005 all financial reports lodged with the Australia Securities and Investments Commission must be prepared in accordance with AIFRS. The transition from Australian Generally Accepted Accounting Principles (AGAAP) to AIFRS resulted in a significant change to the accounting requirements for research and development (R&D) spending. The AIFRS that prescribes the accounting treatment of R&D is AASB 138: *Intangible Assets*. Currently, all research costs have to be expensed as incurred, while development costs may be capitalised provided that a company can demonstrate a number of requirements in relation to the spending (AASB 2009). Previously, under AASB 1011: *Accounting for Research and Development Costs*, all research and all development costs could have been capitalised provided that such spending could be recovered in future periods beyond reasonable doubt (AASB 1987). The accounting requirements of AASB 1011 were arguably simpler and less restrictive while the requirements of AASB 138 are argued to be too conservative (Ahmed & Falk 2006; Deegan 2007). Consequently, it is argued that AASB 1011 may have resulted in a greater amount of R&D spending being capitalised (Ahmed & Falk 2006; Deegan 2007) and that AASB 138 may have caused reductions in R&D spending.

The current study investigates if AASB 138 could have been a catalyst to changes in managerial decisions that consequently resulted in reduced R&D spending. A regression model was used to test whether earnings management and short-termism was prevalent in relation to R&D spending post-2005 and uses the research intensity ratio to determine the trend in R&D spending over the study period.

Literature review

The United States (US) underwent a similar change as Australia in the accounting treatment of R&D spending in 1975. Prior to 1975 all R&D spending could have been capitalised but after 1975 all R&D spending had to be expensed (Horwitz & Kolodny 1980). A few studies investigated whether the amount spent on R&D activities changed due to the change in the accounting treatment requirements in the US. Horwitz and Kolodny (1980) investigated the R&D spending of 43 US companies for the years from 1970 to 1977, inclusive, to determine if the change in US accounting requirements for R&D expenditure had an impact on R&D spending. They used the research intensity ratio to plot R&D spending trends in graph-form for capitalisers (i.e. firms that previously capitalised R&D expenditure) and non-capitalisers (i.e. firms that previously expensed R&D spending immediately in the income statement) for the period under investigation. Elliot et al. (1984) extended and replicated the Horwitz and Kolodny study, examining 75 US companies from 1970 to 1977. Both studies found a significant decline in the R&D spending of capitalisers due to the change in US accounting requirements of R&D expenditure.

More recently, a few studies investigated if companies reduced R&D spending due to changes in managerial decisions and short-term earnings pressures (Baber, Fairfield & Haggard 1991; Latham & Braun 2010; Osma & Young 2009). These studies found that management is likely to reduce R&D spending in order to attain short-term earnings goals. Osma and Young (2009) conducted a study in the UK, which included 3,866 firm-year observations between 1989 and 2002. They found that managers often cut R&D spending in response to target-driven earnings pressures. This is despite growing evidence suggesting that R&D increases long-term value and has long-term returns which contribute to increased long-term company survival (Esteve-Pérez & Mañez-Castillejo 2008; Hee-Jae & Pucik 2005; Seraina & Mario 2008). The pursuit of choosing short-term earnings targets to the detriment of long-term returns is referred to as short-termism (Irving 2009). Graham, Harvey and Rajgopal (2005) surveyed and interviewed more than 400 executives to determine the factors that drive reported earnings. They found over 78% of executives admitted to sacrificing long-term value to smooth current earnings. Therefore, if AASB 138 is indeed a catalyst for short-termism and earnings management it may result in cuts in R&D investments. Ultimately this may be detrimental to the long-term survival of companies and could be damaging to the economy of Australia.

Latham and Braun (2010) developed a regression model to investigate the impact of short-termism on R&D spending. Company's share market valuation was used as a proxy for short-termism. They argued that if changes in market value were statistically significant to changes to R&D spending then it is possible that managers consider R&D spending as a factor impacting their company's market value. Latham and Braun found that when market value declined so too did R&D spending. They argued that managers were reducing investment in risky long-term activities in pursuit of short-term alternatives.

One method in which management may impose their short-term return focus on financial statements is through earnings management. There are two forms of earnings management:

accruals management and real earnings management (Osma 2008; Schipper 1989). Accruals management describes the act of artificially adjusting discretionary accruals in order to effect a desired change on reported earnings. Importantly, accruals management does not impact upon a company's cash flow. Real earnings management, on the other hand, does impact company cash flow and is defined as the act of modifying real activities in order to achieve desired reported earnings. Real activities include investment decisions such as R&D and the timing of the sale of an asset. Studies have shown that real earnings management has resulted in a direct reduction to R&D spending as companies seek to produce desired financial results (Cao & Laksmana 2010; Das, Shroff & Zhang 2009; Osma & Young 2009).

Based on the findings of previous studies, it is possible that AASB 138 could have been a catalyst to sacrificing investments in long-term activities that increases value such as R&D in pursuit of short-termism as a means to manage earnings and hence reduce R&D expenditure. This may be problematic because reductions in R&D spending have the potential to jeopardise a company's long-term survival (Esteve-Pérez & Mañez-Castillejo 2008; Hee-Jae & Pucik 2005; Seraina & Mario 2008). The aim of the current study is to investigate these speculations.

Research design

This section discusses the sampling process, the research methods and the statistical technique applied.

Companies were sampled from the Connect4 Australian financial reports database using the financial reports of the 2002 financial year. This date was chosen as that is the year Australia announced to adopt IFRS. The period under investigation allows the study to observe if the R&D spending of companies that have capitalised R&D under the less stringent requirements of AASB 1011 were reduced due to the more stringent requirements regarding capitalisation of development costs of AASB 138 after 1 January 2005. All financial years beginning in 2000 up to those ending in 2010 were included. The financial year of all Australian companies ends on 30 June.

The term 'research and development' and various permutations of the term were searched for in the 2002 financial statements in order to identify companies that reported R&D spending, either being capitalised or expensed. Only companies that remained in operation throughout the study period were selected. In total, 152 companies were identified using these terms in their 2002 financial statements. However, 108 of these companies merely reported their R&D accounting policy notes but did not disclose any R&D spending figures in the financial statements. Consequently, these companies were excluded from the sample. Three more companies were excluded because financial reports for one or more of the 10 years under investigation were not available. Another eight companies were excluded due to sporadic R&D spending disclosures resulting in discontinuous data on R&D spending during the study period. One company was excluded because it entered administration during the study period and later on in the collection of data phase, another company was excluded due to the unavailability of historical share prices (which were used in the regression model). This resulted in a final sample size of 31 companies. The financial reports for the 10 year study period for these companies were downloaded from the Connect4 Australian financial reports database.

The financial statements of the sampled companies for all years from 2001 to 2004 were studied to determine the company's accounting treatment of R&D expenditure. This was done

to divide the companies into two categories: capitalisers and non-capitalisers. For a company to be classified as a capitaliser it was required to have capitalised a portion of its R&D spending in any financial year prior to 1 January 2005. If a company never capitalised any R&D during this period, thus expensed all R&D directly to the income statement, it was classified as a non-capitaliser. The Latham and Braun (2010) regression model that the current study adopted (discussed next), requires companies to be classified according to industries because it uses aggregate industry R&D spending as a control variable. The sampled companies were therefore also classified according to their broad industry membership in the Australian and New Zealand Standard Industrial Classification (ANSZIC) system. The yearly aggregate industry level R&D spending statistics of all industries represented in the sample were downloaded from the Australian Bureau of Statistics.

Table 1 below shows the industry and the classification of the sampled firms.

Table 1						
Industry and classification of sampled firms						
Industry	Capitaliser		Non-capitaliser		Total	
	No. of companies	%	No. of companies	%	No. of companies	%
Agriculture, Forestry and Fishing	1	6.3	-	-	1	3.2
Mining	-	-	3	20.0	3	9.7
Manufacturing	3	18.8	5	33.3	8	25.8
Electricity, Gas, Water and Waste Services	1	6.3	-	-	1	3.2
Construction	-	-	1	6.6	1	3.2
Information Media and Telecommunications	-	-	1	6.6	1	3.2
Professional, Scientific and Technical Services	11	68.8	5	33.3	16	51.6
Total	16	100.0	15	100.0	31	100.0

Table 1 shows that the majority of sampled companies (16 companies in total) are from the Professional, Scientific and Technical Services category, with Manufacturing being the second most represented industry (8 companies in total). The remainder of the companies are spread across the other industries.

Two research methods were applied in this study. The first method ascertained the trend of R&D spending over the study period. The trend of each sampled firm was determined by calculating the research intensity ratio for each year under investigation. The research intensity ratio is developed by Horwitz and Kolodny (1980) and is determined as follow:

$$RI = \frac{Sales}{R\&D}$$

Where:

RI = Research intensity

Sales = Total sales for the year
R&D = Sum of capitalised and expensed R&D

After calculating the R&D spending trends for each company first, the data was aggregated for capitalisers and for non-capitalisers and for the 4 year period before 1 January 2005 and the 6 year period thereafter. The purpose of aggregating the data was to determine the RI ratio for the two groups for these two periods and to investigate if there are differences in the trends of capitalisers and non-capitalisers and also for the different periods.

The second research method applied is the regression model that Latham and Braun (2010) developed. This model attempts to ascertain the explanatory power of various variables as they relate to changes in R&D spending and is expressed as follows:

$$(\Delta R\&D) = (\Delta MARKETVALUATION) + (\Delta CASHFLOW) + (\Delta NETINCOME) + (\Delta DEBT) + (LEVERAGE) + (R\&D STOCK) + (\Delta INDUSTRYR\&D) + \varepsilon$$

This model comprises the dependent variable ($\Delta R\&D$), the independent variable ($\Delta MARKETVALUATION$), and six control variables. A definition for each of these variables is provided in Table 2.

Table 2
Definitions of Variables

Variable	Definition
$\Delta R\&D$	Change in R&D between two consecutive years
$\Delta MARKETVALUATION$	Change in the market valuation, lagged by one year
$\Delta CASHFLOW$	Change in the net cash flow, lagged by one year
$\Delta NETINCOME$	Change in net income, lagged by one year
$\Delta DEBT$	Change in total debt, lagged by one year
$LEVERAGE$	Debt to asset ratio, for the previous year
$R\&DSTOCK$	Total R&D investment in the preceding 5 years
$\Delta INDUSTRYR\&D$	Change in R&D investment by applicable industry, lagged by one year

Source: Latham and Braun (2010)

Latham and Braun argued that changes in market valuation provide a proxy for the extent of short-termism in explaining observed changes in R&D spending. They reasoned that if market valuation demonstrated significant explanatory power for changes to R&D spending then short-termism likely affected R&D spending decisions. This argument is based on their assumption of a short-term focused capital market. In the current study, the market valuation for each year was determined by downloading the historical share prices of the sampled companies from the BodhiGold database and multiplying that with the outstanding number of shares reported in the financial statements of the particular year.

The Latham and Braun model was used to determine the change in each variable before and after 2005. It is expected that any change in a particular variable will reflect a change in the explanatory power of that variable on observed changes in R&D spending. An increase in the statistical significance of the market valuation variable may signify that the market valuation of the company had become more important to management when considering R&D spending. Similarly, an increase in the statistical significance of the net income variable may indicate the same regarding net income. Finally, an increase in the statistical significance of both the company's total debt and leverage may indicate management's increased concern for possible debt covenants.

Traditional statistical techniques, such as Analysis of Variance (ANOVA), operate under the assumption that each individual measurement is made completely independent of another (Bryk & Raudenbush 1992; Weiers 2008). However, this assumption is inappropriate for longitudinal data that is represented in a hierarchical manner (Bryk & Raudenbush 1992; Latham & Braun 2010). Longitudinal data represents measurements of a subject that are taken repeatedly over a set period of time. In this study, the subject is represented by a company and the repeated measures are key financial disclosures in all financial years from 2001 to 2010. Given that each measurement for a particular company essentially belongs to that company the assumption of independent measurement becomes invalid. For example, the profitability of a company in one year may influence certain spending decisions in the following year. Therefore, the measurements made in each financial year are not always independent of one another. This can further be extended to the industry level, where the industry in which a company operates determines the magnitude of certain expenditures. For example, one may assume that a biotechnology company may spend more funds on research and development than a residential housing construction company. When the assumption of independent observation is no longer appropriate, HLM is recommended as the preferred analysis method (Bryk & Raudenbush 1992; Latham & Braun 2010). The HLM technique has been adopted in the longitudinal studies of many disciplines and has been referred to with various names and descriptions (Bryk & Raudenbush 1992; West 2009). These include: linear mixed models, mixed-effects models, multilevel models and random coefficient models.

The dataset for the current research is of a hierarchical nature and contains repetitive measurements for each sampled company. Therefore it violates the assumptions of traditional statistical analysis techniques. Thus, HLM is used with the regression model to analyse R&D spending changes.

Results

The results of the RI ratio are presented first in a graph, followed by the results of the regression analysis. The RI ratio calculates the percentage of sales that a company devotes to R&D spending in any particular year. A decrease in this ratio may indicate management's decision to reduce R&D spending. Figure 1 shows the median research intensity for each of the 10 years investigated for each of the two groups.

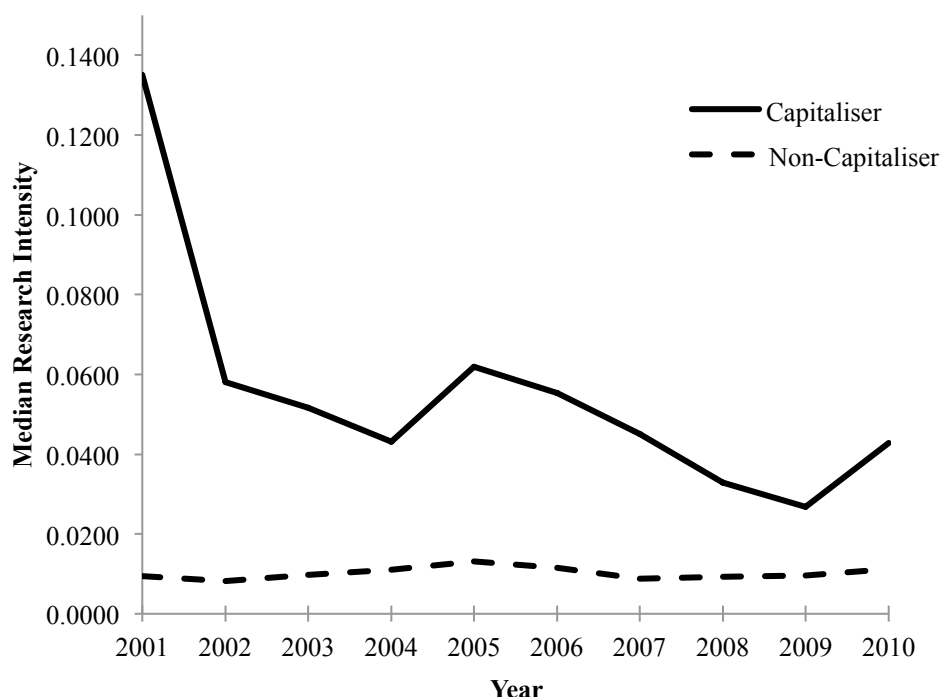


Figure 1 Median research intensity for capitalisers and for non-capitalisers from 2001 to 2010

It is evident from Figure 1 that no significant change in median research intensity occurred for the non-capitaliser group. This may have been expected as the non-capitaliser group had expensed all R&D prior to 2005. Therefore it is likely that they would have continued to do so regardless of the R&D accounting requirements of AASB 138.

Figure 1 also shows a significant difference between the median research intensities of the two groups throughout the study period. The median research intensity for non-capitalisers remained steady throughout the study period. It is clear from Figure 1 that non-capitalisers devoted less of their sales each period to R&D than their capitalising counterparts. Research intensity for capitalisers displays an overall downward trend with the exception of 2005 and 2010 when research intensity increased. This declining ratio shows a reduction in the percentage of sales that capitalising companies devoted to R&D spending. It is unclear whether the introduction of AASB 138 affected the capitaliser group's median research intensity directly or whether their median research intensity would have continued to decline regardless. To clarify this uncertainty the research intensity results are interpreted in conjunction with the regression analysis results later in the paper.

The fact that the non-capitaliser median RI remained relatively steady suggests there were no other factors that would have caused companies to reduce their R&D spending. Therefore, changes to capitaliser R&D spending were likely caused by factors that were unique for capitalising companies. One such factor is the stricter accounting requirements of AASB 138 relating to R&D expenditure.

The regression analysis was conducted to determine if short-termism was evident during the study period. To test for short-termism the significance of the $\Delta MARKETVALUE$ variable is compared for the study period before and that after 2005. Latham and Braun (2010) argue that the significance of the $\Delta MARKETVALUE$ variable is directly related to the prevalence of short-termism. Therefore, an increase in the t-statistic or the significance of that variable

would indicate that short-termism affected R&D spending. Regression analyses were run for capitalisers and for non-capitalisers, for the pre and for the post-2005 periods. The results are presented in Tables 3 to 6. Table 3 shows the results of the regression analysis for the capitaliser group in the 2001 to 2004 period and Table 3 for the non-capitaliser group for this period.

Table 3
Regression analysis results for Capitalisers from 2001 to 2004 inclusive

Parameter	Estimate	Std. Error	df	t	P
Intercept	-0.046	0.027	10.221	-1.725	0.115
$\Delta MARKETVALUE$	0.002	0.001	15.626	1.848	0.084
$\Delta NETINCOME$	-0.096	0.009	7.646	-10.319	0.000
$\Delta CASHFLOW$	0.168	0.002	7.613	71.548	0.000
$\Delta DEBT$	0.475	0.176	22.897	2.700	0.013
$LEVERAGE$	-0.064	0.988	29.824	-0.645	0.524
$R\&DSTOCK$	0.000	0.000	5.814	2.316	0.061
$\Delta INDUSTRYR\&D$	0.129	0.079	29.645	1.641	0.111

Table 3 shows that the change in market value was statistically insignificant ($P > 0.05$) for capitalisers from 2001 to 2004. This indicates that short-termism did not have any significant explanatory power in terms of changes to R&D spending. Changes in debt was a significant control variable for capitalisers in the 2001 to 2004 period, indicating that debt may have been a significant source of funds for the R&D activities of capitalisers. Table 3 also shows that changes to net income and cash flow were statistically significant ($P < 0.05$) from 2001 to 2004. This indicates that capitalisers considered their net income and the availability of cash in making R&D spending decisions. The significance of net income suggests that earnings management may have had some impact on R&D prior to 2004.

Table 4
Regression analysis results for Non-capitalisers from 2001 to 2004 inclusive

Parameter	Estimate	Std. Error	df	t	P
Intercept	0.014	0.010	9.022	1.288	0.230
$\Delta MARKETVALUE$	0.000	0.000	7.872	2.838	0.022
$\Delta NETINCOME$	-0.273	0.013	14.951	-21.476	0.000
$\Delta CASHFLOW$	0.083	0.001	15.571	8.584	0.000
$\Delta DEBT$	0.026	0.056	7.881	0.455	0.661
$LEVERAGE$	-0.038	0.056	8.236	-0.687	0.511
$R\&DSTOCK$	0.000	0.000	7.547	0.984	0.356
$\Delta INDUSTRYR\&D$	-0.005	0.011	7.421	-0.479	0.646

Table 4 shows that changes in market value were statistically significant for non-capitalisers from 2001 to 2004. Since a change in market value is a proxy for short-termism, this implies that short-termism was evident for this group during this time period and that short-termism is positively correlated with R&D spending. Table 4 also shows that changes to net income and cash flow were statistically significant ($P < 0.05$) for non-capitalisers from 2001 to 2004. This is similar to the result of the capitalisers group suggesting that cash flow is considered in R&D spending decisions and that earnings management may be prevalent amongst non-capitalisers. Tables 3 and 4 also show that both groups have a negative (-10.319 and -21.476 t-statistic respectively) correlation between R&D spending and net income, and a positive (71.548 and 8.584 t-statistic respectively) correlation with cash flow. One possible explanation for this negative relationship is that non-capitalising companies may have attempted to protect their profits by reducing investments in risky activities such as R&D. As discussed in the literature review, this phenomenon is described as real earnings management (Osma 2008; Schipper 1989) namely the act of modifying real activities in order to achieve a desired change on reported earnings, which also impacts cash flow.

The next two tables show the regression model results for the period from 2005 to 2010. Table 5 shows the results of capitalising and Table 5 the results for the non-capitalising group for this period.

Table 5
Regression analysis results for Capitalisers from 2005 to 2010 inclusive

Parameter	Estimate	Std. Error	df	t	P
Intercept	0.019	0.007	24.915	2.558	0.017
$\Delta MARKETVALUE$	0.006	0.001	9.669	9.891	0.000
$\Delta NETINCOME$	-0.005	0.001	8.699	-13.330	0.000
$\Delta CASHFLOW$	-0.019	0.001	23.527	-16.432	0.000
$\Delta DEBT$	0.012	0.008	17.656	1.502	0.151
$LEVERAGE$	-0.130	0.007	11.203	-19.595	0.000
$R\&DSTOCK$	0.000	0.000	21.039	9.707	0.000
$\Delta INDUSTRYR\&D$	-0.032	0.038	29.724	-0.843	0.406

In contrast to Table 3, Table 5 shows that market value was statistically significant for capitalisers in the 2005 to 2010 period. This indicates that short-termism became evident only after 2005 and suggests that investments in R&D decreased as the market value of a company dropped. It is possible that management could have decided to reduce R&D in order to meet profit targets and also to possibly increase market value. This suggests earnings management may be prevalent after the introduction of AASB 138 in 2005.

Table 6
Regression analysis results for Non-capitalisers from 2005 to 2010 inclusive

Parameter	Estimate	Std. Error	df	t	P
Intercept	-0.196	0.099	50.623	-1.984	0.053
$\Delta MARKETVALUE$	0.003	0.009	42.668	0.329	0.744
$\Delta NETINCOME$	-0.285	0.024	26.242	-12.068	0.000
$\Delta CASHFLOW$	0.111	0.122	34.316	9.032	0.000
$\Delta DEBT$	-0.214	0.635	24.140	-0.337	0.739
$LEVERAGE$	0.609	0.381	42.615	1.597	0.118
$R\&DSTOCK$	0.000	0.000	25.864	0.105	0.917
$\Delta INDUSTRYR\&D$	0.135	0.424	56.813	0.318	0.751

Table 6 shows that all but $\Delta NETINCOME$ and $\Delta CASHFLOW$ were statistically insignificant for non-capitalisers post 2005. Table 4 showed that in addition to these two variables, $\Delta MARKETVALUE$ was also statistically significant before 2005. It therefore appears that the market valuation of non-capitalisers lost its explanatory power for changes in R&D spending

following 2005. The global financial crisis, starting in 2008, may be partly responsible for this statistical change. The share prices of the non-capitaliser group may have varied significantly as a result and therefore the regression model may have been unable to find a correlation between the share price movements and changes to R&D spending of the non-capitaliser group. Table 6 also shows a slight increase in the correlation for cash flow and R&D spending to 9.032 compared with 8.584 in Table 4.

The regression results are interpreted in conjunction with the research intensity results in the next section.

Interpretation

Referring to the $\Delta MARKETVALUE$ variable for capitalisers in Tables 3 and 5, it can be concluded that short-termism became statistically significant for capitalisers following the introduction of AASB 138 in 2005. Furthermore, by ignoring the proxy relationship between market value and short-termism that Latham and Braun (2010) argued, it is clear that R&D spending was significantly positively correlated with market value. This shows that R&D was directly adjusted through earnings management in response to changes in a company's share price. It is therefore argued that the more conservative R&D accounting requirements of AASB 138 likely caused changes in managerial decisions in pursuit of short-termism, resulting in earnings management by way of reduced R&D spending. The research intensity results in Figure 1 show an overall downward trend in research intensity for the capitaliser group. On their own, the research intensity results do not provide conclusive evidence as to the cause for the decline in research intensity. However, short-termism (Graham, Harvey & Rajgopal 2005) and earnings management (Osma & Young 2009) have been linked with reduced R&D spending. Therefore it may be argued that the decline in research intensity after 2005 would have been less severe if short-termism and earnings management had not impacted R&D spending. Interpreting the regression results in conjunction with the research intensity results leads to the following conclusion: AASB 138 was a catalyst for changes in managerial decisions in pursuit of short-termism, and resulted in earnings management by way of reduced R&D spending for companies that capitalised R&D expenditure prior to 2005.

Summary and conclusion

Prior studies have established a causal link between short-termism (Graham, Harvey & Rajgopal 2005) and earnings management (Osma & Young 2009) with reduced R&D spending. However, no studies were found that examined if changes to R&D accounting requirements may have affected short-termism and earnings management in Australia. This study attended to this gap and adopted the Latham and Braun (2010) regression model to examine the possible impact of earnings management and short-termism on R&D spending for listed Australian companies for the period from 2001 to 2010. The regression model used the statistical significance of changes in company market valuation as a proxy for short-termism, as argued by Latham and Braun (2010). The results showed a significant positive correlation between market valuation and changes in R&D spending of capitalising companies after 2005. However, prior to 2005 there was no statistically significant correlation between the market valuation and R&D spending of these companies. This suggests that short-termism, as a means of earnings management, impacted the R&D spending of capitalising companies following the introduction of AASB 138 in 2005.

To ascertain R&D spending trends, the research intensity ratio for all sampled companies over the study period were calculated. The research intensity ratio shows the percentage of sales a company devotes to R&D spending. To obtain meaningful results from the research intensity calculation the sample was divided into two groups: capitalisers and non-capitalisers. Non-capitalisers were used as a control group in order to account for any other events that may have affected R&D spending. The results showed that non-capitaliser R&D spending remained steady throughout the study period. However, there is a downward trend for the whole period under investigation for the capitalising group.

The study makes three contributions to the body of knowledge. Firstly, the research intensity ratios show that Australian listed companies reduced their R&D spending following the introduction of AASB 138 in 2005. Secondly, it demonstrates a link between the R&D accounting requirements of AASB 138 and earnings management and a subsequent impact on the R&D spending of capitalising companies. Thirdly, the study shows a link between changed R&D accounting requirements and reduced R&D spending. The study's contributions show that AASB 138 is a catalyst to changes in managerial decisions in pursuit of short-termism through reduced R&D spending of capitalising companies.

Understanding that R&D accounting requirements may result in managerial decisions to manage earnings and consequently reduce R&D spending could be most useful to two stakeholders: standard setters and company boards of directors. The results of this study may contribute to standard setters' awareness of the impact that AASB 138 had on managerial decisions and the reduction of R&D spending. This result suggests that companies may have chosen to invest in activities with short-term, less risky, returns as opposed to more risky investments in long-term activities, such as R&D. Reducing R&D investments have the potential to undermine the future survivability of a company (Esteve-Pérez & Mañez-Castillejo 2008; Hee-Jae & Pucik 2005; Seraina & Mario 2008). This may ultimately be detrimental to the Australian economy. The results of this study may also be useful to company boards. In order to ensure the long-term survival of their companies' boards may implement policies to prevent managerial decisions that result in unwarranted reductions in R&D. They may also link these policies with executive bonus schemes and reduce the amount of the bonus if it is found that R&D spending was reduced unnecessarily.

The research intensity results show an overall declining trend in R&D spending for the entire period under investigation for capitalisers. However, there was virtually no change in the spending of R&D for the non-capitaliser group. This suggests that there was a unique factor that significantly affected the R&D spending of capitalisers. It is possible that the R&D accounting requirements of AASB 138 are too conservative, and resulted in a decline in R&D spending for companies that had capitalised their R&D previously applying AASB 1011 before 2005. Hence it could be argued that AASB 138 could have been a catalyst in managerial decisions to manage earnings and hence to decrease R&D spending.

This study reinforced the findings of similar studies conducted in the US and the UK: there is a causal link between short-termism and R&D spending. The study also illustrated that there is a link between AASB 138, earnings management and short-termism and a decline in R&D spending. It can therefore be concluded that the stricter R&D accounting requirements of AASB 138 was a catalyst to changes in managerial decisions to invest in short-term activities with short-term returns instead of long-term activities such as R&D. This may be to the disadvantage of the survival of companies and ultimately to the Australian economy.

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