AN INVESTIGATION OF COMPETING EXPLANATIONS FOR THE DISCONTINUITY IN REPORTED EARNINGS IN AUSTRALIA

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1. INTRODUCTION

1.1 Background

General purpose financial reports (GPFR) are prepared to help stakeholders make rational resources allocation decisions based on accounting numbers and other information. Within those accounting numbers, the most important one is the earnings figure since it is widely used as a key financial performance indicator (Holland and Ramsay, 2003). Australian accounting standards and the Corporations Act require managers to prepare GPFR. During the process of preparing financial reports, managers must exercise judgement. For example, managers have discretion to make accounting estimations such as estimating doubtful debts for the current year’s accounts receivables. Allowing managers to have discretion allows measurement of accounting earnings to better reflect firm performance but gives managers the opportunity to manipulate earnings. Moreover, management compensation and other contracts may provide incentives for managers to manipulate earnings. For instance, in Australia, “(M)eeting or surpassing last year’s profit figure may well be an important trigger for executive bonuses”\(^1\) (Holland and Ramsay, 2003, p. 45). Therefore, managers have opportunities and incentives to manipulate earnings. The action of manipulating earnings by using management discretionary powers in the financial reporting process with the intention to make some private benefits is defined as ‘earnings management’ (Healy and Wahlen, 1999). Since earnings management distorts the usefulness of the reported accounting information, a substantial amount of research has been developed to detect earnings management.

\(^1\) Also, in the US, Healy (1985, p.85) pointed out that “earnings-based bonus schemes are a popular means of rewarding corporate executives”.

Several recent studies adopt the distribution approach to detect earnings management. Burgstahler and Dichev (1997) use this approach to examine the distribution of reported earnings of US firms. Their results show that there is a ‘kink’ at zero in the earnings level and earnings change distribution.\(^2\) Precisely, there are more small profit making firms (notably, the benchmark beating group) and fewer small loss making firms (notably, the just miss group) around zero. Holland and Ramsay (2003) adopt this approach and report similar outcomes for Australian firms. Both interpret this “kink” as evidence of earnings management and argue that management manipulate earnings to beat the benchmark.

However, recent research claims that the ‘kink’ cannot be used as evidence of earnings management. Dechow, Richardson and Tuna (2003) analyse the benchmark beating group reported in previous distribution approach studies. They employ four different models to measure the unexpected positive accruals of those firms. Previous researchers such as Healy (1985) and Jones (1991) argue that management manipulates earnings by boosting unexpected accruals. Therefore, Dechow, Richardson and Tuna (2003) argue that if the earnings kink is caused by earnings management, the benchmark beating group should have large positive unexpected accruals relative to the just miss group and other firms. However, their results suggest that those firms do not have unusual unexpected accruals compared with the just miss group. Coulton, Taylor and Taylor (2005) conduct a similar study using Australia data and attain identical results. Hence, both argue that the earnings kink is not evidence of earnings management.

\(^2\)“Zero” in the earnings distribution and changes in earnings distribution is argued as the key threshold in distribution approach studies.
What then causes the ‘kink’ in reported earnings? Durtschi and Easton (2005) claim that deflation effect and sample selection bias rather than earnings management cause the earnings kink reported in previous US distribution approach studies. The deflator considered in their study, which was also used in other US-based leading studies, is the beginning market value of equity.

1.2 Objectives

The above discussion leads to the primary research objective of this study, which is to test whether the “earnings kink” reported in Holland and Ramsay (2003) and other Australian studies are caused by deflation effect and sample selection bias. The second research objective is related to the first objective. Since Dechow, Richardson and Tuna (2003) and Coulton, Taylor and Taylor (2005) argued if earnings management cause the earnings kink, the benchmark beating group should have higher unexpected positive accruals than the just miss group and other firms. In their studies, different models were used to capture the unexpected accruals. Interestingly, all variables incorporated in these models were deflated numbers. The failure to find significantly higher unexpected accruals in the benchmark beating group relative to the just miss group may be due to the effect of scaling. To examine this explanation, two deflators will be used in this study to measure the unexpected accruals of the benchmark beating group, the just miss group and other firms. One is the original deflator used by Coulton, Taylor and Taylor (2005), which is the beginning book value of equity.

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3 Burgstahler and Dichev (1997) use beginning market value of equity as deflator in their distribution approach study.

4 For example, in the modified Jones model (Dechow, Sloan and Sweeney, 1995), the value of total accruals, change in revenue, change in accounts receivable and plant, property and equipment in the estimation period are all deflated by lagged market value of equity or lagged total assets.
total assets. The other one is the beginning number of shares. Hence, the second research objective is to test whether measurements of unexpected accruals with two different deflators generate different outcomes.

1.3 Motivations

As outlined above, ‘Earnings management research’ is one of the most important topics in current financial accounting research. The two leading approaches used to detect earnings management are the distribution approach and the aggregate accruals approach (McNichols, 2000). Essentially, deflators play an important role in both approaches.

Given the different deflators used in Australian studies (the beginning book value of total assets) and various different economic factors between Australian and the US market, it is unclear if deflation will have a similar impact on Australian distribution approach studies. Therefore, it is important to examine the causation of the earnings kink is reported in previous Australian studies.

In addition, the reason that Dechow, Richardson and Tuna (2003) and Coulton, Taylor and Taylor (2005) do not find significantly higher unexpected accruals in the benchmark beating group relative to the just miss group may be due to the effect of deflation. Since their studies use aggregate accrual approach, an examination of deflation effect on this approach is essential.

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5 Barth and Clinch (2007) found share-deflated (deflated by number of shares) specification performed better than other commonly used deflators. Although their research was solely based on Ohlson’s valuation model, it can be expected that using the number of shares as the deflator in those expected accrual models that employed by Coulton, Taylor and Taylor (2005) may give a different outcome.

6 For example, the number and size of listed firms in Australia are generally smaller than the US. Therefore, whether deflation will have a similar impact on Australia-based distribution approach study is unclear. Also, the degree of pressure to meet market expectations may also different in Australia and the US.
2. LITERATURE REVIEW

In the late 1980s and early 1990s, researchers developed a series of related measures designed to detect earnings management. The measures developed have been named by McNichols (2000) as the aggregate accruals approach. Under this approach, researchers divide the total accruals into expected accruals (non-discretionary accruals) and unexpected accruals (discretionary accruals). The unexpected portion of total accruals is used to capture earnings management.

The key to the aggregate accruals approach is to estimate the expected portion of total accruals. Hence, the value of unexpected accruals is the difference between actual total accruals and the estimated expected accruals. Consequently, models used for estimating expected accruals need to be developed. Jones (1991) designed a time-series model to estimate expected accruals. This model is expressed as:

\[ TACC = \alpha + \beta_1 \Delta REV + \beta_2 PPE + \varepsilon \]  

(1)

where \( TACC \) is total accrual of the current year, \( \Delta REV \) is the change in sales revenue from the previous year to the current year and \( PPE \) is the gross value of property, plant and equipment of the current year. Subsequently, several modified Jones models has been developed. Notably, these models were also employed cross-sectionally in subsequent earnings management studies.\(^7\)

\(^7\) For example, DeFond and Subramanyam (1998) use cross-sectional version of the Jones model to estimate the unexpected accruals in their study, Dechow, Richardson and Tuna (2003) and Coulton, Taylor and Taylor (2005) use these modified cross-sectional Jones model in their research.
The aggregate accruals approach soon became the most common one used in earnings management research. However, there are several problems with this approach. Dechow, Sloan and Sweeney (1995, p. 223) summarise the performance of all unexpected accruals models that have been developed. They conclude that: “the power of the tests is low for earnings management of economically plausible magnitudes. When the models are applied to samples of firm-years experiencing extreme financial performance, all models lead to misspecified tests”. Hence, measurement errors of unexpected accruals will exist if the above conditions apply.

In addition, since the modified cross-sectional Jones model is usually applied in recent earnings management studies, issues related to the cross-sectional regression need to be addressed. Under this method, McNichols (2000) expect the accruals of each industry to be estimated. Initially, one sample firm will be taken out from this industry. After that, contemporaneous data for the rest of the firms in this industry will be used to estimate the coefficient of the underlying models. Finally, the estimated coefficient and the sample firm’s data will be used to produce the unexpected accruals of this firm. Firms that do not have sufficient data to employ the underlying models will be deleted. This will reduce the sample size and may induce some bias. Moreover, the primary assumption for the cross-sectional method is that there is no earnings management for those firms that were used to estimate the coefficient of the underlying models. However, this assumption is not reliable since those firms may also have incentives to manipulate their earnings.

8 These models include: (1) the Healy Model (Healy, 1985), (2) the DeAngelo Model (DeAngelo, 1986), (3) the Jones Model (Jones, 1991) and (4) the Modified Jones Model (Dechow, Sloan and Sweeney, 1995).
Since measurement errors of the aggregate accruals approach have been identified, a new approach, developed by Burgstahler and Dichev (1997), has been employed. Under this approach, they initially hypothesise that managers have motivations to meet certain earnings thresholds. The most common used earnings thresholds are (1) reporting positive earnings, and (2) reporting positive changes in earnings. Burgstahler and Dichev (1997) graphically present the pooled, cross-sectional frequency distribution of reported earnings and reported changes in earnings. They find that discontinuities (‘kinks’) exist around both thresholds (see footnote 2). That is, there are significantly more firms that report small profits or small positive changes in earnings and significantly less firms that report losses or small negative changes in earnings. They argue that this phenomenon is caused by management earnings manipulation in order to beat their earnings threshold. Hence, the discontinuities in reported earnings and reported changes in earnings distribution can be used as evidence of earnings management. Holland and Ramsay (2003) adopt this methodology and report similar outcomes for Australian firms. McNichols (2000) calls this approach as the distribution approach to detect earnings management.

Subsequent research examined the issue whether the earnings kink is evidence of earnings management. This research brings the aggregate approach and the distribution approach together and uses the former approach to examine the earnings kink reported in the latter approach. Dechow, Richardson and Tuna (2003) argue that if the earnings kink is to be used as evidence of earning management, it means that the benchmark beating group beat their earnings threshold by manipulating earnings upwards. Since the aggregate approach studies argue that managers manipulate earnings through accruals, the benchmark beating group should have significantly higher positive unexpected accruals relative to both the just miss group and other firms. Therefore, Dechow, Richardson and Tuna (2003) employ four
modified cross-sectional Jones models to measure the unexpected accruals of those firms. Surprisingly, they find that although the benchmark beating group has higher positive unexpected accruals than other firms, they have similar positive unexpected accruals to the just miss group. Coulton, Taylor and Taylor (2005) conduct a similar study on Australia data and attain identical results. Hence, both argue that the earnings kink is not evidence of earnings management.

Therefore, what is the true reason for the ‘kink’ in previous reported earnings and change in earnings? Durtschi and Easton (2005, p.591) evaluate the earnings kink reported in previous US-based distribution approach study. They claim that those earnings kinks are caused by factors other than earnings management. These factors encompass “(1) deflation, (2) sample selection criteria that lead to differential inclusion/exclusion of observations to the left of zero versus observations to the right of zero, (3) differences between the characteristics of observations to the left of zero and to the right of zero… or (4) a combination of these effects”.

Initially, Durtschi and Easton (2005) examine the effect of deflation in previous distribution approach studies. Since the earnings of large numbers of different size firms are being compared in a distribution approach study, the ‘size’ effect needs to be mitigated before making any inferences. Barth and Clinch (2007, p.8) review several past studies that address the size effect. These studies “identify a variety of issues related to the scale or size of the

9 Beaver, McNichols and Nelson (2004) predicted that “the discontinuity in (price-deflated) earnings changes is largely driven by the same factors that determine the discontinuity in the distribution of (price-deflated) earnings levels” (Durtschi and Easton, 2005, p. 560). Hence, Durtschi and Easton (2005) is consistent with this argument and focus on the earning level distribution.

10 In this paper, the factor “Differences between the characteristics of observations to the left of zero and observations to the right of zero” (Durtschi and Easton, 2005, p. 591) will not be considered.
firm that can cause inference problems in capital markets-based accounting research”. Therefore, the earnings level and change in earnings level distributions studies incorporate deflated numbers in order to mitigate the size effect. After dividing by a deflator, the ‘scaled’ number is assumed to be comparable across all firm sizes.\textsuperscript{11}

However, the deflator used to ‘scale’ earnings may not effectively mitigate the size effect, and it may cause other statistical problems. Initially, Burgstahler and Dichev (1997) use the beginning market value of equity as the deflator of reported earnings. The distributions of these deflated earnings show an earnings kink around zero. However, when Durtschi and Easton (2005) use another deflator, which is the beginning number of shares, to deflate the reported earnings, there is no earnings kink, and the distribution of these deflated earnings is smooth.

Why do earnings deflated by these two deflators give different distributions? If deflators can be perfectly used to mitigate the size effect, the outcomes of these two deflated earnings distributions should tell the same story (that is, either an earnings kink exists in both distributions or there is no earnings kink in both distributions). Therefore, Durtschi and Easton (2005) start to doubt the effectiveness of these deflators. If deflators are biased, outcomes induced by the biased deflator will distort the true story. For the earnings level kink, firms to the right of zero are profit making firms and those to the left are loss making firms. Therefore, to evaluate whether these deflators are biased it is necessary to find out whether deflators of profit making firms are significantly different from the deflators of loss making firms. Durtschi and Easton (2005) firstly evaluate the beginning number of shares.

\textsuperscript{11} For example, if firm A has $100 profit and firm B has $1 million profit, without deflation, there is no comparability between A and B. After we deflate their profit by, say their beginning market value of equity, we will get a ratio which is comparable, hence, this is the purpose of deflation.
The results show that no significant differences between the beginning number of shares of profit making firms and loss making firms. Hence, deflation by the beginning number of shares does not distort the earnings distribution. Rather, it may indicate that deflation by the beginning market value of equity distorts the earnings distribution.

Since the only difference between the beginning market value of equity and the beginning number of shares is the price per share at the beginning of the year,\textsuperscript{12} Durtschi and Easton (2005) evaluate the beginning share prices of profit making firms and loss making firms. They find that profit making firms have significantly higher mean and median share prices than loss making firms in every one-cent EPS interval from +/- $0.01 to +/- $1.00. Since the earnings deflated by the beginning market value of equity equals to EPS divided by price per share, and as EPS distribute smoothly, the generally higher denominators (price per share) for profit making firms and lower denominators for loss making firms must be contributing to the earnings kink. This means that profit making firms at each EPS interval will be divided by a higher denominator than loss making firms in the corresponding interval. Dividing by a higher denominator will push the profit making firms’ deflated earnings relatively close to zero in their earnings level distribution. Conversely, dividing by a lower denominator will spread the loss making firms’ deflated earnings further from zero in their earnings level distribution. Consequently, an earnings kink is derived.

The sample selection criteria used in previous earnings management studies are also considered in Durtschi and Easton (2005, p.566). Their results show “larger proportion of loss making firms…deleted from the sample because of an inability to calculate beginning

\textsuperscript{12} The value of beginning market value of equity is the product of number of shares and price per share at the beginning of the year.
market value of equity in general”. Furthermore, they conduct a detailed test for the firms within the +/- one-cent EPS interval. They observe significantly more deleted loss making firms (755) than profit making firms (532), as a result of incorporation of a criterion namely the beginning market value of equity. Since more loss making firms (especially small loss making firms) are deleted from the sample, it will consequently reduce the number of small loss firms at earnings level distribution. Thus, it is concluded that the earnings kink at zero might be partially caused by the sample selection criteria.

3. HYPOTHESIS DEVELOPMENT

Given the different deflators used in Australian studies (the beginning book value of total asset) and various different economic factors between Australian and the US market (see footnote 6), it is important to examine the causation of the earnings kink that has been reported in previous Australian studies. Notably, Coulton, Taylor and Taylor (2005) briefly examine the influence of scale effect on the earnings kink reported in previous Australia-based studies in their study. However, given that the sample size used by them is unreasonably low, inferences about the earnings kink cannot be made based on their study. Four measures of earnings level will be considered in this paper. They are (a) undeflated (raw) earnings, (b) earnings deflated by the beginning number of shares, (EPS) (c) earnings deflated by the beginning book value of total asset, and (d) earnings deflated by the beginning market value of equity. Therefore, the primary hypothesis (in null form) is:

Hypothesis 1: The earnings kink at zero in Australia studies is not caused by deflation effect and sample selection bias.

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13 In their study, they find that 41% of loss making firms were deleted due to the lack of beginning market value of equity in contrast with 34% of profit making firms.
14 Coulton, Taylor and Taylor (2005) only use 168 sample firm-years to consider the deflation issue.
The second hypothesis in this study is related to the result of the first hypothesis. If this paper cannot reject H1, it means that earnings management is still a valid and powerful reason for the earnings kink. Therefore, investigating why the findings of Coulton, Taylor and Taylor (2005) did not support this argument becomes a new issue. One possible explanation is that their results were distorted by deflation.

If this paper rejects H1, it means that deflation and sample selection bias can be used to explain the earnings kink. Hence, the levels of unexpected positive accruals should be similar across all firms since there is no earnings management. Coulton, Taylor and Taylor (2005) found that the benchmark beating group and the just miss group had similar levels of unexpected positive accruals, but both of them had significantly higher levels of unexpected positive accruals than other firms. One possible explanation for this finding is that their results were distorted by deflation. To examine this explanation, two deflators will be used in this study: (1) the original deflator used by Coulton, Taylor and Taylor (2005), which is the beginning book value of total asset, and (2) the beginning number of shares.

Initially, the study of Coulton, Taylor and Taylor (2005) will be replicated with three more years’ data. The results generated by this replication will be compared with their findings. Motivations include (a) an additional three years data may change their results, (b) before comparing the results generated by two different deflators, time effect need to be eliminated,\(^\text{15}\) and (c) data sources used by them may contain some errors. Hence, the first part of the second hypothesis (in null form) is:

\(^{15}\) Data from 1993 to 2005 will be used in this paper to estimate the unexpected accruals with another deflator, which is beginning number of shares. Without eliminating the time effect, direct comparison the results that will generate in this paper with Coulton, Taylor and Taylor (2005)’s findings are meaningless, since they use the data from 1993 to 2002. Hence, replication of their study with more recent data is necessary.
Hypothesis 2a: When unexpected accruals are estimated using the beginning book value of total assets as the deflator, there will be no significant difference between the unexpected accruals of the benchmark beating group and the just miss group. Both the benchmark beating group and the just miss group will have significantly higher levels of unexpected accruals than other firms.

Subsequently, after eliminating the time effect, whether different deflators generate the same results can be tested. Hence, the second part of the second hypothesis (in null form) is:

Hypothesis 2b: when unexpected accruals are estimated using the beginning number of shares as the deflator, there will be no significant difference between the unexpected accruals of the benchmark beating group and the just miss group. Both the benchmark beating group and the just miss group will have significantly higher levels of unexpected accruals than other firms.

4. METHODOLOGY

4.1. Methodology used for Hypothesis 1

Initially, pooled, cross-sectional frequency distributions based on Australian listed firms’ financial data need to be presented graphically. These distributions cover (1) undeflated earnings, (2) earnings deflated by the beginning number of shares, (3) earnings deflated by the beginning book value of total asset, and (4) earnings deflated by the beginning market value. Since histograms are used in these frequency distributions, interval width for each
histogram needs to be determined. Consistent with Holland and Ramsay (2003), interval widths will be determined using methods developed by Silverman (1986) and Scott (1992). \[^{16}\]

After presenting these four frequency distributions in this paper, visual inspection is required to determine whether a discontinuity exists in these distributions. Subsequently, the models developed by Burgstahler and Dichev (1997) are used to test whether the number of firms in intervals around the earnings kink is significantly unusual.

When there is no earnings management, the expected number of firms in the testing interval should be equal to the average number of firms in its two adjacent intervals (Burgstahler and Dichev, 1997). The test statistic used to test this statement is calculated as:

\[^{16}\] Silverman’s methods: interval width = 0.79 (IQR) \(n^{-1/5}\), or 1.06\(\sigma n^{-1/5}\), or 0.9(min (\(\sigma\), IQR/1.34)) \(n^{-1/5}\), Scott (1979)’s method: interval width = 3.5\(\sigma n^{-1/3}\), where, \(\sigma\) = Standard deviation of sample, IQR = inter-quartile range in sample and \(n\) = number in sample.
where, $ANF$ is the actual number of firms in the testing interval, $ENF$ is the expected number of firms in the testing interval and. $N$ is the total number of observations, $p_i$ is the probability of an observation will fall into interval $i$, $p_{i-1}$ is the probability of an observation will fall into interval $i - 1$, $p_{i+1}$ is the probability of an observation will fall into interval $i + 1$. Hence, when the absolute value of calculated test statistics for intervals adjacent to zero is higher than test statistics at accepted significance levels (ie 5%, 1% level), the above statement can be rejected.

After plotting the frequency distributions and testing the existence of an earnings kink, investigation of the deflation effect and sample selection bias will then be performed. The method used to investigate the deflation effect will be similar to that used by Durtschi and Easton (2005). Firstly, means and medians of the beginning number of shares of every undeflated earnings interval are calculated. Comparisons of these means and medians between positive undeflated earnings and negative undeflated earnings of the same amount are made for every undeflated earnings interval. Secondly, the means and medians of lagged book value of total assets per share and lagged market price per share of every earnings per share’s interval are calculated. Comparisons of these means and medians between positive earnings per share and negative earnings per share of the same amount are made for every earnings per share interval. Finally, the medians of lagged book value of total assets per share and lagged market price per share at all EPS intervals will be plotted. In addition,
significance test for these comparisons will be performed. To be consistent with Durtschi and
Easton (2005), the Fama and MacBeth (1973) method will be adopted to compute the t-
statistic since it will mitigate the effect of cross-sectional correlation. The t-statistic is given
by:

\[
    t = \frac{1}{T} \sum_{t=1}^{T} \bar{X}_t - \frac{1}{T} \sum_{t=1}^{T} \bar{Y}_t \sqrt{s_p^2 \left( \frac{1}{n_1} + \frac{1}{n_2} \right)}
\]

where \( \bar{X}_t \) is the mean of portfolio \( t \) in sample 1, \( \bar{Y}_t \) is the mean of portfolio \( t \) in sample 2, \( n_1 \)
is the size of sample 1, \( n_2 \) is the size of sample 2, \( T \) is the number of portfolios\(^{17} \) and \( s_p^2 \) is the
pooled variance that is derived from the equation:

\[
    s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{(n_1 - 1) + (n_2 - 1)}
\]

where \( s_1^2 \) is the variance of sample 1, \( s_2^2 \) is the variance of sample 2, \( n_1 \) is the size of sample 1
and \( n_2 \) is the size of sample 2.

Furthermore, a detailed test of the two intervals adjacent to zero will be performed. Initially,
firms in the intervals adjacent to zero at the earnings per share distribution will be taken out.
Frequency distributions will be plotted for (1) earnings scaled by lagged book value of total
asset, and (2) earnings scaled by lagged market value of equity for these firms. Subsequently,
the Fama and MacBeth’s (1973) method will be employed to test whether the number of
firms in the first positive interval next to zero is significantly higher than the number of firms
in the first negative interval next to zero on these two frequency distributions. The objective

\(^{17} \) Each portfolio is a separate year’s data, for example, if we have 13 years, we will have 13 portfolios.
is to test whether the deflator for profit making firms is generally higher than loss making firms, hence inducing the deflation effect.

Tests of sample selection bias will employ similar methodology to that used by Durtschi and Easton (2005). Firstly, all firms listed on the Australian Stock Exchange (ASX) during the period 1993 to 2005, which also have their ‘earnings’ data in the ASPECT database, will be examined. Those firms will be divided into loss making firms (group 1) and profit making firms (group 2) according to their earnings. Secondly, all firms listed on the ASX during the period 1993 to 2005, which also have their ‘earnings’ data and ‘beginning book value of total asset’ (the sample selection criteria) data in ASPECT database, will be examined. Those firms will be divided into loss making firms (group 3) and profit making firms (group 4) according to their earnings.

Hence, comparison can be made between group 1 and group 3, and between group 2 and group 4. The purpose of these comparisons is to show the deleted proportion (numbers) of loss making firms and profit making firms due to the sample selection bias. Again, significance test of this comparison will be employed. Hence, if the test results show that a larger proportion (numbers) of loss making firms have been deleted than profit making firms, it means that the earnings kink reported in previous Australian studies is partially induced by the sample selection criteria.

4.2. Methodology used for Hypothesis 2

The purpose of H2 is to examine the impact of the deflator on the measurement of unexpected accruals for the benchmark beating group, the just miss group and other firms. To be consistent with Coulton, Taylor and Taylor (2005), three modified cross-sectional Jones model will be employed to estimate the expected accruals. The first model of expected
accruals was developed by Dechow, Sloan and Sweeney (1995) and named the modified Jones model. In contrast to the original Jones model, the change in sales revenue is adjusted by the change in accounts receivables. Hence, the modified Jones model is as follows:

$$TACC = \alpha + \beta_1(\Delta REV - \Delta REC) + \beta_2 PPE + \varepsilon$$

(5)

where $\Delta REV$ is the change in sales revenue from the previous year to the current year, $PPE$ is the gross value of property, plant and equipment at the end of the year, $\Delta REC$ is the change in accounts receivable from the previous year to the current year, $TACC$ is the total accruals of the current year. To be consistent with Coulton, Taylor and Taylor (2005) and Hribar and Collins (2002), $TACC$ is calculated as earnings minus cashflow from operation.

The second model of expected accruals was developed by Dechow, Richardson and Tuna (2003) and named the lagged modified Jones Model. In contrast to model represented by equation (5), a new independent variable, which is the lagged (the previous year's) value of total accruals ($LTACC$), is included in this model. Hence, the lagged modified Jones Model is as follows:
\[ TACC = \alpha + \beta_1(\Delta REV - \Delta REC) + \beta_2PPE + \beta_3LTACC + \varepsilon \]  \hspace{1cm} (6)

The third and final model of expected accruals was developed by Dechow, Richardson and Tuna (2003) and named the forward-looking modified Jones model. In contrast to model represented by equation (6), an additional independent variable, which is growth in sales revenue of the next year \((GROWTH)\), is included in this model. Hence, the forward-looking modified Jones model is as follows:

\[ TACC = \alpha + \beta_1(\Delta REV - \Delta REC) + \beta_2PPE + \beta_3LTACC + \beta_4GROWTH + \varepsilon \]  \hspace{1cm} (7)

In this paper, these models will be estimated cross-sectionally for each Global Industry Classification Standard (GICS) 4-digit industry group in each year from 1993 to 2005. The error term \(\varepsilon\) will be the value of unexpected accruals.

Coulton, Taylor and Taylor (2005) use the beginning book value of total assets as the deflator to measure the unexpected accruals of the benchmark beating group, the just miss group and other firms. Their results showed that the benchmark beating group have similar levels of unexpected accruals to the just miss group, both of the benchmark beating group and the just miss group have significantly higher levels of unexpected accruals than other firms. To test H2a, three more years’ data but the same deflator (the beginning book value of total asset) will be used in this study to estimate the unexpected accruals of the benchmark beating group, the just miss group and other firms. If the results are the same as these formed by Coulton, Taylor and Taylor (2005), then H2a cannot be rejected. If any of the comparisons gives different outcomes, then H2a will be rejected. This test will show whether three more years’ data will vary Coulton, Taylor and Taylor (2005)’s findings.
To test H2b, another deflator, which is lagged number of shares, will be used to estimate unexpected accruals for the benchmark beating group, the just miss group and other firms. This study will then compare (1) levels of unexpected accruals of the benchmark beating group with the just miss group, (2) levels of unexpected accruals of the benchmark beating group with other firms, (3) levels of unexpected accruals of the just miss group with other firms. If this study gets the same results as the results generated by using the beginning book value of total asset as deflator, then H2b will not be rejected. Appendix 1 illustrates the process of testing H2a and H2b.

4.3. Sample and Data Collection

4.3.1 Period of Study

The period of study in this paper is from 1993 to 2005.\(^\text{18}\)

4.3.2 Data used for Hypothesis 1

Firstly, all firms listed on the ASX during the period 1993 to 2005, which also have their ‘earnings’, ‘beginning book value of total asset’, ‘beginning market value of equity’ and ‘beginning number of shares’ data in the ASPECT database, will be selected as samples to test the deflation effect in hypotheses 1. Secondly, All firms listed on the ASX during the period 1993 to 2005, which also have their ‘earnings’ and ‘beginning book value of total asset’ data in the ASPECT database, will be selected as samples to test the sample selection bias in hypotheses 1.

4.3.3 Data used for Hypothesis 2

\(^\text{18}\) Since cashflow from operations data were available on ASPECT only from 1993.
Since H2 requires running three different models, sample firm-years for testing H2 must have data that can be used to employ these models. Hence, sample firm-years used to test H2 have to meet all of the following criteria. Firstly, they must be Australian listed firms during the period 1993 to 2005. Secondly, they must have their ‘earnings’, ‘beginning book value of total asset’, ‘beginning market value of equity’, and ‘beginning number of shares’ data in the ASPECT database. Thirdly, they also need to have their ‘cash flow from operations’ and ‘book value of property, plant and equipment’ data in the ASPECT database. Finally, they must have sufficient data available in the ASPECT database to calculate their ‘change in sales revenues’, ‘lagged value of total accruals’, ‘growth in sales revenues for the following period’ and ‘change in accounts receivables’. Since cross-sectional models will be used for testing H2, GICS 4-digit industry group will be used for industry classification. Industries with less than 10 firms in a particular year will be deleted.

4.3.4 Definition of Variables

The above are defined as follows:

(1): ‘earnings’ as used in this paper are earnings after income tax expenses but before extraordinary items.

(2): ‘beginning book value of total asset’, ‘beginning market value of equity’, ‘beginning number of shares’, ‘cash flow from operations’ and ‘book value of property, plant and equipment’ are financial reporting numbers that should be disclosed on the ASPECT database directly if available. In addition, ‘beginning’ means the 1st day of reporting period.

(3): ‘Change in accounts receivables’ is calculated as the current year’s accounts receivables minus the previous year’s accounts receivables. ‘Change in sales revenues’ is calculated as
the current year’s sales revenues minus the previous year’s sales revenues. In addition, ‘lagged value of total accruals’ is calculated as the previous year’s earning minus the previous year’s cash flow from operation. Finally, ‘growth in sales revenues for the following period’ is calculated as the next year’s sales revenues minus the current year’s sales revenues. Accounts receivables and sales revenues are financial reporting numbers that should be disclosed on the ASPECT database directly if available.

5. **EXPECTED RESULTS**

Results of this study should be able to answer the following questions:

(1): Is the earnings kink at zero in Australian studies caused by deflation and sample selection bias?

(2): when unexpected accruals are estimated by using the beginning book value of total asset as a deflator, will the benchmark beating group have similar levels of unexpected positive accruals to the just miss group? Will both of the benchmark beating group and the just miss group have significantly higher levels of unexpected accruals than other firms?

(3): when unexpected accruals are estimated by using the beginning number of shares as a deflator, will the benchmark beating group have similar levels of unexpected positive accruals to the just miss group? Will both of the benchmark beating group and the just miss group have significantly higher levels of unexpected accruals than other firms?

(4): Does deflation effect exist in aggregate accruals approach studies?
Since the aggregate accruals approach and the distribution approach are used most commonly in recent earnings management studies, the significance of the results of this study is that they may tell us something about the potential problems related to both approaches. If this study can show that the earnings kink reported in previous Australia-based studies is caused by deflation, it can further test the robustness of Durtschi and Easton’s (2005) findings, which is based on the US evidence, and hence conclude that earnings kink cannot be used as evidence of earnings management. Similarly, if this study can show that choice of deflator will vary the outcomes provided by the modified Jones model, it will give us a reasonable ground to believe that the deflation effect also exists in aggregate accruals approach studies. In conclusion, when aggregate accruals approach and distribution approach are employed in future’s earnings management studies, the deflator needs to be selected carefully and deflation effect needs to be considered before making any inference.
7: REFERENCES


APPENDIX 1: AN ILLUSTRATION OF THE PROCESS OF TESTING HYPOTHESIS 2

<table>
<thead>
<tr>
<th>Category1: Deflated by lagged total asset</th>
<th>Category2: Deflated by lagged total asset</th>
<th>Category3: Deflated by beginning number of shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison results use unexpected accruals calculated by Coulton, Taylor and Taylor (2005)</td>
<td>Comparison results use unexpected accruals that will be generated by this research</td>
<td>Comparison results use unexpected accruals that will be generated by this research</td>
</tr>
<tr>
<td>Compare levels of unexpected accruals of the benchmark beating group with the just miss group</td>
<td>= (1)</td>
<td>4</td>
</tr>
<tr>
<td>Compare levels of unexpected accruals of the benchmark beating group with other firms</td>
<td>&gt; (2)</td>
<td>5</td>
</tr>
<tr>
<td>Compare levels of unexpected accruals of the just miss group with other firms</td>
<td>&gt; (3)</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 1
Table 1 illustrates the process of testing H2a and H2b. Category 1 are results generated by Coulton, Taylor and Taylor (2005), category 2 are results that will generate in this paper by using lagged book value of total asset, category 3 are results that will generate in this paper by using lagged number of shares. For testing H2a, if 1=4 and 2=5 and 3=6, H2a cannot be rejected, if any of them are significantly different, (for example, if 1≠4 and 2=5 and 3=6) H2a will be rejected. For testing H2b, if 4=7 and 5=8 and 6=9, H2b cannot be rejected, if any of them are significantly different, H2b will be rejected.