THE PERSISTENCE AND PRICING OF EARNINGS, ACCRUALS AND FREE CASH FLOWS: AUSTRALIAN EVIDENCE

Kristen ANDERSON
Australian Accounting Standards Board, Australia
Kerrie WOODHOUSE, Alan RAMSAY and Robert FAFF
Department of Accounting and Finance, Monash University, Australia

ABSTRACT

We test the persistence (H1) and pricing (H2) results found by Sloan (1996) in the Australian market. Our results generally support H1, showing that earnings are persistent, however the persistence of losses appears just as high as that of profits. When earnings are decomposed into future cash flows (FCF) and accruals, the persistence of FCF is generally greater than that of accruals. For H2, earnings are significantly underpriced, a result that contrasts with Sloan (correctly priced) and Dechow et al. (2006) (overpriced). The extent of mispricing appears lower for profits and greater for losses. When earnings are decomposed into FCF and accruals, results show significant mispricing for all samples – Australian investors significantly underestimate the persistence of FCF. This is especially so for firms with negative earnings and negative FCF. In contrast to Sloan (1996), our results indicate that the Australian market never overestimates the persistence of accruals.

earnings persistence, accruals, cash flows, Australia

INTRODUCTION

The pioneering research on the accrual anomaly is Sloan (1996). He identifies the differential persistence of cash flow and accrual components of current earnings for future earnings and shows that market pricing fails to fully reflect this differential persistence. He also shows that trading strategies designed to exploit this mispricing (long in the lowest accrual portfolio, short in the highest accrual

portfolio) produce statistically and economically significant returns. The explanation offered by Sloan (1996) is that investors 'fixate' on earnings, failing to reflect information contained in the cash flow and accrual components.

In this paper, we investigate the extent to which current earnings, free cash flows and 'accruals' of Australian firms persist into the future (H1). We then investigate whether Australian stock prices correctly reflect the information contained in the free cash flow and accrual components of current earnings of Australian firms (H2).

The motivation for our research initially comes from dearth of Australian research on the accrual anomaly. Apart from data on Australia in an international study by Pincus *et al.* (2007), there is nothing published on the accrual anomaly in Australia.[i] Further, there is little Australian research on the persistence of earnings and its components (see Hodgson & van Praag, 2006; Oei *et al.,* 2006). This study provides external validity for Sloan (1996) and provides further evidence on earnings fixation as the explanation for the accrual anomaly.

The accruals measure used by Sloan (1996) and others (working capital accruals and depreciation) is subject to several potential problems. First, it omits important accruals representing the capitalisation of expenditure on non-current assets. Recent accounting scandals have highlighted the significance of this class of accruals (eg WorldCom), which are ignored in the traditional accruals measure. Second, Sloan (1996) also excludes tax, non-operating and special items from earnings and hence from accruals. Thus his calculated accruals and cash flows do not articulate with the information presented in the firm's cash flow statement. An important contribution of our paper is to test whether Australian investors price securities as if they use and understand information disclosed in the cash flow statement. Third, Sloan calculates accruals by balance sheet reconstruction. While this approach is unavoidable for Sloan (1996) as cash flow data was not available for most of the period of his study, in our study cash flows are measured directly from the cash flow statement.

Our measure of accruals is earnings after tax and abnormal items minus free cash flow (the sum of cash flow from operations + cash flow from investing, with both amounts taken direct from the cash flow statement). Although our accruals are measured as a residual, use of the direct approach to measuring cash flows in which cash flows are taken direct from the cash flow statement and not reconstructed via the balance sheet (Hribar & Collins, 2002), should reduce measurement error in accruals. Further, the use of free cash flows in measuring accruals is justified on the basis that free cash flows are an important construct in corporate finance (Jensen, 1986) and evidence shows that free cash flow plays an important role in valuation and pricing (Lundholm & Sloan, 2004, ch. 6). This provides some justification for considering the pricing effects of free cash flows,

whereas we are not aware of any justification for considering the pricing effects of cash flows as defined and measured by Sloan (1996).

Our results for H1 generally show significant earnings persistence in Australia. The persistence parameter for firm years reporting losses appears higher than that for profits. This is contrary to the arguments and evidence of Hayn (1995), but is more consistent with recent US evidence on persistent losses in Joos and Plesko (2005) and Australian evidence on persistence of losses in Wu and Fargher (2007). When earnings are decomposed into free cash flows and accruals, free cash flows are more persistent than accruals when using decile ranks, but not otherwise. Thus the evidence supporting H1 is mixed.

H2 predicts that the implied persistence from market pricing will be consistent with the actual persistence of earnings and its components. The results generally show significant mispricing (underpricing). But for the sample of profit years, the implied persistence and the actual persistence of earnings are not significantly different. This latter result is consistent with Sloan (1996) and with earnings fixation as the explanation for mispricing. The significant underpricing found for all other results is inconsistent with Sloan (1996, correct pricing) and inconsistent with Dechow *et al.* (2006, overpricing).

When earnings are disaggregated into free cash flow and accruals, the implied persistence from market pricing is significantly different to (less than the) actual persistence (as measured by the cross equation Wald test) for accruals. However, it is insignificant for all other sub-samples. We find some evidence of underpricing of accruals, more evidence that cannot reject correct pricing of accruals and no evidence of overpricing of accruals. This differs from Sloan (1996) and Dechow *et al.* (2006) both of whom find overpricing of accruals. In relation to free cash flows, we find significant underpricing for all samples (although only at the 10% level for the sub-sample of profit years). Underestimation of the persistence of cash flows is consistent with the results of Sloan (1996), but not with Dechow *et al.* (2006) who find significant overestimation of the persistence of free cash flows by US investors.

In explaining and justifying our results, part of the difference in our results for aggregate earnings may be attributed to differences in the definition of earnings. Sloan (1996) uses earnings from continuing operations, which is pre-tax and excludes extraordinary items, discontinued operations, special items and non-operating items. Thus Sloan eliminates many of the less persistent components of earnings from his testing. We use earnings after tax and abnormal items, we exclude extraordinary items (relatively rare in our time period) but includes tax expense and 'special' items. Larger and more important differences arise in the definition and measurement of cash flows and accruals, and differences between our definitions and those of Sloan (1996) must be kept in mind. However, our

definitions are the same as those of Dechow *et al.* (2006), yet our results for the persistence and pricing of earnings, cash flows and accruals are quite different to theirs. Hence, differences in definitions are unlikely to be the sole factor contributing to our results.

The remainder of the paper is structured as follows. Section 2 briefly reviews the prior literature and develops our hypotheses. Section 3 outlines the variables and methodology used. Section 4, first outlines the data and sample and then presents and discusses the results. Finally, in Section 5 we summarise our findings and make concluding remarks.

1. HYPOTHESIS DEVELOPMENT

1.1 The persistence of earnings and its components

To assist in making better predictions of future earnings, it is useful to know the degree of persistence in earnings and its components. The higher the level of persistence, the more useful the earnings is going to be for earnings forecasting as it will be a reliable measure of next period's performance. Earnings are comprised of two components: the cash flows of the firm for the period and the accruals that are created by the accountant so that earnings better reflect firm performance. Cash flows suffer from matching and timing problems, which makes them noisy indicators of performance (Dechow *et al.*, 1998). The superior measure of firm performance is the measure that more closely reflects expected cash flows as opposed to realised cash flows. The evidence suggests that accruals improve the ability of earnings to reflect firm performance (Dechow, 1994).

Sloan (1996) examines the relative persistence of the accrual and cash components of earnings. He finds evidence supporting increasing persistence of earnings as the cash flow component increases, and decreasing persistence of earnings as the accrual component increases. This is explained in terms of the differential reliability of cash flows and accruals. Since accruals are the product of accounting allocation, they are more subjective than cash flows. Cash flows are not subject to discretionary allocations or influenced by any accounting policy choices. Where actual cash flow accounts for a substantial portion of the firm's earnings, those earnings are more likely to be sustainable, than would be the case if a major part of the earnings was based accruals. Based on prior literature we hypothesize:

H1: Persistence of the current earnings is decreasing (increasing) in the accrual (cash flow) components

1.2 The pricing of earnings and its components

Information about the firm's cash flows and accruals are available to investors once the firm's financial report is publicly available. It would be expected that investors

would efficiently impound information about the differential persistence of the firms' cash flows and accruals into share prices. The evidence of Sloan (1996) and others is contrary to this view. Sloan's results show that the market overweights (underweights) the less (more) persistent accruals (cash flows). Sloan (1996) posits that the components of earnings are mispriced because the market 'fixates on earnings'.

Dechow *et al.* (2006) find results inconsistent with earnings fixation – they find that investors overestimate the persistence of earnings. Using the same definitions of cash flows and accruals as our study, Dechow *et al.* (2006) confirm the overpricing of accruals but find that free cash flows are also overpriced. They suggest that this is not because of an earnings fixation, but due to an overpricing of the accruals and a smaller overpricing of the cash component.

The earnings fixation explanation for mispricing of cash flows and accruals has also been investigated by Kothari *et al.* (2006). They present evidence that is inconsistent with the earnings fixation hypothesis but is consistent with the mispricing resulting from the 'agency costs of overvalued equity' (Jensen, 2005). The agency theory of overvalued equity predicts that managers of such firms will attempt to boost their firm's reported performance in order to meet investor and analyst expectations. Such firms are likely to aggressively engage in earnings management using large positive accruals. When firms are sorted according to current accruals, the high accrual deciles are likely to be over-represented with firms with prior overvaluation. Finally, the agency cost of overvalued equity explanation predicts that investors will overestimate the persistence of income increasing (positive) accruals but will not overestimate the persistence of income decreasing (negative) accruals. Given the conflicting results of prior research we hypothesize:

H2: Earnings expectations embedded in stock prices correctly reflect the level of persistence of the accrual and free cash flow components of earnings

2. RESEARCH DESIGN

2.1 Variable definitions

Earnings and the components of earnings are defined as follows:

$EARNINGS_t$ = (income after tax and abnormal items and before extraordinary items) /AVERAGE ASSETS

FCF = (cash from operating activities + cash from investing activities) / AVERAGE ASSETS[ii]

$ACCRUALS_t$ = ($EARNINGS_t$ – cash from operating activities – cash from investing activities)[iii]/AVERAGE ASSETS

$ARET_{t+1}$ = $r_{t+1} - \tau_{t+1}$, where r_{t+1} (τ_{t+1}) = actual (expected) equity return for t+1

As in Dechow *et al.* (2006) and Sloan (1996) returns are calculated beginning four months after the year end. $ARET_{t+1}$ follows the size adjusted approach adopted by Sloan (1996). This approach requires the calculation of the annual buy-hold return based on a portfolio of size matched firms from the complete ASX over the year as a proxy for expected return. The decile portfolios are based on the market value of equity at June 30th in the calendar year of their accounting year end and firms are then matched to a portfolio based on their capitalisation at the start of the returns year (4 months after their accounting year end).

2.2 Testing of Hypothesis H1

To test the persistence of earnings and its components we use the relationship in Freeman *et al.* (1982):

$$EARNINGS_{t+1} = \alpha_0 + \alpha_1 EARNINGS_t + \varepsilon_{t+1} \quad (1)$$

The coefficient α_1 represents the persistence of earnings. Following Sloan (1996) and Dechow *et al.* (2006) we decompose $Earnings_t$ into further components, thus:

$$EARNINGS_{t+1} = \alpha_0 + \alpha_1 ACCRUALS_t + \alpha_2 FCF_t + \varepsilon_{t+1} \quad (2)$$

Here, the coefficients α_1 and α_2 represent the persistence of each of the components of earnings. Equations (1) and (2) are alternative versions of the forecasting equation.

2.2 Testing of Hypothesis H2

Sloan (1996) and Dechow *et al.* (2006) base their pricing tests on a framework developed by Mishkin (1983). It is assumed that earnings are a driver of returns and that abnormal returns occur in response to earnings surprises:

$$(r_{t+1} - \tau_{t+1}|\varphi_t) = \beta(EARNINGS_{t+1} - EARNINGS^{e}_{t+1}) + \varepsilon_{t+1} \quad (3)$$

where

φ_t = information set available at the end of period t
$Earnings^{e}_{t+1}$ = A rational forecast of the firms t+1 earnings at time t
β = A valuation multiplier

Equation (3) gives us a rational pricing for shares. The abnormal returns on a share should be related to the abnormal (unexpected) earnings of the firm where actual earnings are different from the expected earnings. The forecasting equation (2) can be seen as a rational expectation of earnings ($Earnings^{e}_{t+1}$). Thus substituting (2) into (3) we obtain:

$$(r_{t+1} - \tau_{t+1}|\varphi_t) = \beta[EARNINGS_{t+1} - (\alpha_0^* + \alpha_1^* ACCRUALS_t + \alpha_2^* FCF_t)] + \varepsilon_{t+1} \quad (4)$$

Equation (4) is the pricing equation. Considering the pair of equations (2) and (4), if the market is efficient and correctly pricing the persistence of the components of

earnings, then the constraint exists that $\alpha_0^* = \alpha_0$, $\alpha_1^* = \alpha_1$, $\alpha_2^* = \alpha_2$. If the market is inefficient at pricing the cash components of earnings, the persistence implied by the market returns will not equal the actual persistence.

In order to test the market's efficiency, a likelihood ratio test is applied based on a statistical comparison of the pricing equation estimated in restricted form (i.e. coefficients are constrained to be equal to the forecasting equation counterparts) and unrestricted. Both estimations use simultaneous non-linear least squares. We also use a cross-equation Wald test, to examine whether the individual components of earnings are mispriced. The Wald statistic tests whether, for example, $\alpha_1^* = \alpha_1$.[iv]

3. RESULTS

3.1 Data and sample

The data were extracted from the Finanalysis database provided by Aspect Huntly.[v] The sample was limited to the 1992-2004 time frame as cash flow statements (CFS) did not become mandatory in Australia until the introduction of the predecessor to AASB107 *Cash Flow Statements* in 1992. The initial sample yielded 12391 firm-year observations, however, after the necessary data exclusions (including matching of accounting and share price data), our final sample reduced to 3507 firm-years.

3.2 Descriptive statistics

EARNINGS can be interpreted as a return on assets (given its scaling by total assets). The mean of the $EARNINGS_t$ is -8.9%, while the median is close to zero. For our persistence sample, 43.7% of firm observations report negative earnings (losses). Dechow *et al.* (2006) reported a negative mean $EARNINGS_t$ (INCOME) for their persistence sample of just -1.6% suggesting that the average profitability of Australian firms is considerably worse than US firms. $ACCRUALS_t$ represent the change in net operating assets of the entity. Our sample shows net operating assets are growing at 1.6%. As the firms are, on average, loss-making and their asset bases are slowly increasing, it follows that they also have negative FCF_t to support their asset base. That is, firms are generating cash inflows from investors (debt or equity) or are reducing their cash balance. Similarly Dechow *et al.* (2006)'s sample also shows a positive, but much larger, $ACCRUALS_t$ (5.8%) and negative FCF_t (-7.3%) in order to support the asset growth. The mean (median) r_{t+1} of all firms is 3.24% (6.45%). $ARET_{t+1}$, the size adjusted abnormal return, has a mean (median) return of -9.71% (-5.60%). Firms in our sample are, on average, making below the average return for firms of a similar size. Although Dechow *et al.* (2006) also had a negative median $ARET_{t+1}$ (-8.0%), they had a positive mean $ARET_{t+1}$ (1.5%).

3.3 Results for the persistence of earnings and its components

H1 investigates whether the persistence of the current earnings is decreasing in the accruals and increasing cash flows. We begin by examining the persistence of aggregate earnings.

Table 1. **Testing persistence of earnings**

Panel A: Aggregate Persistence	
Coefficient	Estimated Coefficient
α_1	0.665**
	(8.009)
Adj. R^2	0.298
Panel B: Persistence Decomposed into Accruals and Future Cash Flows	
Coefficient	Estimated Coefficient
α_1	0.614** (5.891)
α_2	0.705** (9.268)
Adj. R^2	Adj. R^2 0.300
Wald Test: $\alpha_1 = \alpha_2$ (p-value)	1.879 (0.170)

This table reports the estimation of forecasting equations to explore the persistence of earnings. Panel A shows the aggregate persistence, while Panel B disaggregates into accruals and future cash flows (FCF). The sample size is 3507 firm-year observations, representing the full set of firms for which all accounting and share price data are available to perform the ultimate pricing tests. The forecasting equation in Panel A is given by:

$$EARNINGS_{t+1} = \alpha_0 + \alpha_1 EARNINGS_t + \varepsilon_{t+1}$$

while the counterpart for Panel B is:

$$EARNINGS_{t+1} = \alpha_0 + \alpha_1 ACCRUALS_t + \alpha_2 FCF_t + \varepsilon_{t+1}$$

where $EARNINGS_{t+1}$= the earnings of the firm after abnormal items but before extraordinary items in year t+1; $ACCRUALS_t$ = EARNINGS – Cash flows from operating activities – cash flows from investing activities; FCF_t = Cash flow from operating activities + cash flow from investing activities. All variables are standardised by average assets. t-statistics are reported in parentheses below parameter estimates. Significance at the 1% (5%) level indicated by ** (*).

Panel A of *Table 1* shows that earnings are persistent, α_1 being 0.6651. We also estimated the forecasting equation using decile ranks of earnings formed annually for each sample year. Earnings were again highly persistent, but the coefficient was somewhat lower (0.5870). We examined the persistence of earnings in loss years and profit years separately. Following Hayn (1995), we expected profit years to be more persistent that loss years, however, in untabulated results using continuous measures, we find α_1 is 0.3938 for profit making years and 0.6373 for loss making years. However, when measured using ranks, α_1 is approximately 0.590 for both groups. That is, in Australia losses appear at least as persistent as profits.[vi]

Panel B of *Table 1*, similar to Sloan (1996) and Dechow *et al.* (2006), shows that the actual persistence of the FCF_t component of earnings (α_2 = 0.705) is numerically higher than the $ACCRUALS_t$ component of earnings (α_1 = 0.614). However, unlike the prior research, the Wald statistic indicates for our sample the coefficients on $ACCRUALS_t$ and FCF_t are not significantly different (5% level). This result suggests that there is no accrual anomaly present in the Australian market in that the actual persistence of the $ACCRUALS_t$ and FCF_t are not significantly different. However, in unreported results the persistence regressions using ranks show that FCF_t is significantly more persistent for future earnings than $ACCRUALS_t$. This result is consistent with Sloan (1996) and with Dechow *et al.* (2006) and supports H1. In untabulated results, we again split the sample into profit and loss years. For profits, cash flows are more persistent than accruals (using both continuous variables and decile ranks). However, for loss years using continuous variables there is no difference between the persistence of cash flows and accruals, but when estimated using decile ranks, cash flows are more persistent than accruals. This again indicates that extreme observations are an issue for loss years.[vii] Taken overall, the results for H1 are somewhat mixed.

3.4 Results for the pricing of earnings and its components

H2 investigates whether the earnings expectation embedded in stock prices correctly reflect the level of persistence of the accrual and free cash flow components of earnings. We begin by examining the pricing of aggregate earnings.

Table 2. **Estimation results for Sloan's aggregate earnings persistence and pricing model**

Panel A: Full Sample				
Actual Persistence from Forecast Equation		Implied Market Persistence from Pricing Equation		Cross Equation Wald Statistic
Coefficient	Estimated Coefficient	Coefficient	Estimated Coefficient	
α_1	0.665**	α_1*	0.020	43.000**
	(8.009)		(0.126)	
		β	0.268**	
			(5.202)	
Adj. R^2	0.298	Adj. R^2	0.058	
Test of Market Efficiency:	$\alpha_1 = \alpha_1$*			
Likelihood Ratio Statistic	165.35			
(p-value)	(0.000)			
Panel B: Positive Earnings sub-sample				
Actual Persistence from Forecast Equation		Implied Market Persistence from Pricing Equation		Cross Equation Wald Statistic
Coefficient	Estimated Coefficient	Coefficient	Estimated Coefficient	
α_1	0.394**	α_1*	0.406**	0.019
	(3.376)		(3.207)	
		β	0.957**	
			(6.220)	
Adj. R^2	0.078	Adj. R^2	0.114	
Test of Market Efficiency:	$\alpha_1 = \alpha_1$*			
Likelihood Ratio Statistic	5.39			
(p-value)	(0.075)			
Panel C: Negative Earnings sub-sample				
Actual Persistence from Forecast Equation		Implied Market Persistence from Pricing Equation		Cross Equation Wald Statistic
Coefficient	Estimated Coefficient	Coefficient	Estimated Coefficient	
α_1	0.637**	α_1*	0.201	6.410*
	(5.849)		(1.004)	
		β	0.195**	
			(5.009)	

Panel A: Full Sample				
Actual Persistence from Forecast Equation		Implied Market Persistence from Pricing Equation		Cross Equation Wald Statistic
Adj. R^2	0.228	Adj. R^2	0.037	
Test of Market Efficiency:	$\alpha_1 = \alpha_1^*$			
Likelihood Ratio Statistic	144.81**			
(p-value)	(0.000)			

This table reports the joint estimation of forecasting and pricing equations to explore the persistence and pricing of aggregate earnings. Panel A shows the full sample results (N = 3507 firm-year observations), Panel B shows the positive earnings sub-sample (N = 1976 firm-year observations) and Panel C shows the negative earnings sub-sample (N = 1531 firm-year observations). The pair of forecasting and pricing equations, respectively, is given by:

$EARNINGS_{t+1} = \alpha_0 + \alpha_1 EARNINGS_t + \varepsilon_{t+1}$

$ARET_{t+1} = \beta[EARNINGS_{t+1} - (\alpha_0^* + \alpha_1^* EARNINGS_t)] + \varepsilon_{t+1}$

where $EARNINGS_{t+1}$= the earnings of the firm after abnormal items but before extraordinary items in year t+1; and $ARET_{t+1}$= the actual return less the expected return based on the size matched portfolio. Earnings is standardised by average assets. t-statistics are reported in parentheses below parameter estimates. Significance at the 1% (5%) level indicated by ** (*).

Panel A of *Table 2* shows the persistence and pricing of earnings for our full sample (3507 firm-years). The market's implied persistence coefficient α_1^* from the pricing equation is insignificant at 0.020. This suggests that the market does not expect there to be any persistence in the earnings of Australian firms. The significant cross equation Wald statistic and likelihood ratio statistic indicate that there is significant mispricing of overall earnings in the Australian market and that the market underestimates the persistence of earnings ($\alpha_1^* < \alpha_1$). Untabulated results using decile ranks confirm the results in Panel A.

This result contrasts sharply with Sloan (1996) who found aggregate earnings correctly priced ($\alpha_1^* = \alpha_1$) and argued that investors 'fixate' on earnings.[viii] It also contrasts with Dechow *et al.* (2006) who found that investors overestimate the persistence of earnings ($\alpha_1^* > \alpha_1$). They attributed the difference in their results compared to Sloan (1996) to the inclusion of later time periods in which earnings have become less persistent and there is a greater likelihood of losses being reported by US firms (Joos & Plesko, 2005). To investigate this issue further we split the sample into positive and negative earnings years and re-ran the Mishkin (1983) regressions. Results are shown in Panel B for profit-making years and Panel C for loss-making years.

For the profit making years, the results are similar to Sloan (1996) in that the cross-equation Wald test cannot reject the view that aggregate earnings are correctly priced ($\alpha_1^* = \alpha_1$), however the likelihood ratio statistic is marginally significant indicating pricing of profit-making firms in Australia is close to being efficient. Panel C shows that for the loss-making years very different results are found. The implied persistence coefficient for aggregate earnings from the market is insignificant and the cross equation Wald test rejects the view that $\alpha_1^* = \alpha_1$. The market clearly underestimates the persistence of losses in the Australian market resulting in significant mispricing of aggregate earnings when earnings are negative.[ix] We now investigate how the market *prices* the persistence of $ACCRUALS_t$ and FCF_t. Results are shown in *Table 3*.

Table 3. **Estimation results for Sloan's earnings persistence and pricing model – decomposed into accruals and Future Cash Flows**

Actual Persistence from Forecast Equation		Implied Market Persistence from Pricing Equation		Cross Equation Wald Statistic
Coefficient	Estimated Coefficient	Coefficient	Estimated Coefficient	
α_1	0.614**	α_1^*	0.330*	6.002*
	(5.891)		(2.147)	
α_2	0.705**	α_2^*	-0.243	53.927**
	(9.268)		-(1.036)	
		β	0.263**	
			(5.439)	
Adj. R^2	0.300	Adj. R^2	0.063	
Wald Statistic				
$\alpha_1 = \alpha_2$	1.879	$\alpha_1^* = \alpha_2^*$	6.334*	
(p-value)	(0.170)		(0.012)	
Test of Market Efficiency:	$\alpha_1 = \alpha_1^*$ and $\alpha_2 = \alpha_2^*$			
Likelihood Ratio Statistic	185.14**			
(p-value)	(0.000)			

This table reports the joint estimation of forecasting and pricing equations to explore the persistence and pricing of earnings, decomposed into its accruals and future cash flow components for the full sample (N = 3507 firm-year observations). The pair of forecasting and pricing equations, respectively, is given by:

$$EARNINGS_{t+1} = \alpha_0 + \alpha_1 ACCRUALS_t + \alpha_2 FCF_t + \varepsilon_{t+1}$$

$$ARET_{t+1} = \beta[EARNINGS_{t+1} - (\alpha_0^* + \alpha_1^* ACCRUALS_t + \alpha_2^* FCF_t)] + \varepsilon_{t+1}$$

where $EARNINGS_{t+1}$ = the earnings of the firm after abnormal items but before extraordinary items in year t+1; $ARET_{t+1}$ = the actual return less the expected return based on the size matched portfolio; $ACCRUALS_t$ = EARNINGS – Cash flows from operating activities – cash flows from investing activities; and FCF_t = Cash flow from operating activities + cash flow from investing activities. All variables except ARET are standardised by average assets. t-statistics are reported in parentheses below parameter estimates. Significance at the 1% (5%) level indicated by ** (*).

The implied persistence coefficient on $ACCRUALS_t$ is positive and significant, however the implied persistence coefficient on FCF_t is insignificant. A Wald test that the implied pricing coefficient on $ACCRUALS_t$ (α_1*) equals the implied coefficient on FCF_t (α_2*) is rejected, with the coefficient on $ACCRUALS_t$ being significantly higher than for FCF_t. The cross-equation Wald tests show that the implied persistence for both $ACCRUALS_t$ and FCF_t are significantly lower than their actual persistence. The evidence is consistent with a rejection of hypothesis H2 that the market correctly prices the persistence of the components of earnings. The individual coefficient mispricing is further supported by the overall likelihood ratio which is significant, indicating that earnings, decomposed into $ACCRUALS_t$ and FCF_t, are mispriced.[x]

This result contrasts with Sloan (1996) who found that investors tend to overestimate the persistence of accruals ($\alpha_1^* > \alpha_1$) and underestimate the persistence of cash flows ($\alpha_2^* < \alpha_2$). They also contrast with Dechow *et al.* (2006) who found that investors overestimate the persistence of both accruals ($\alpha_1^* > \alpha_1$) and to a lesser degree cash flows ($\alpha_2^* > \alpha_2$). They attributed the difference in their results compared to Sloan (1996) to the inclusion of later time periods in which earnings have become less persistent. They argue investors do differentiate between cash flows and accruals but inherently overestimate the persistence of the less persistent accrual component. Our results are quite different indicating that Australian investors underestimate the persistence of both cash flows and accruals, but more so for cash flows.[xi]

Again, we investigate this issue further by splitting the sample into positive and negative earnings years and re-running the Mishkin (1983) regressions. Results are shown in *Table 4*.

Table 4. **Estimation results for Sloan's earnings persistence and pricing model – decomposed into accruals and Future Cash Flows: positive vs. negative earnings cases**

Panel A: Positive Earnings sub-sample				
Actual Persistence from Forecast Equation		Implied Market Persistence from Pricing Equation		Cross Equation Wald Statistic
Coefficient	Estimated Coefficient	Coefficient	Estimated Coefficient	
α_1	0.369**	α_1*	0.498**	1.909
	(3.194)		(3.588)	
α_2	0.437**	α_2*	0.248	3.697
	(3.919)		(1.802)	
		β	0.933**	
			(6.115)	
Adj. R^2	0.085	Adj. R^2	0.124	
Wald Statistic				
$\alpha_1 = \alpha_2$	6.415*	α_1*= α_2*	11.579**	
(p-value)	(0.011)		(0.001)	
Test of Market Efficiency:	$\alpha_1 = \alpha_1$* and $\alpha_2 = \alpha_2$*			
Likelihood ratio Statistic	37.62**			
(p-value)	(0.000)			
Panel B: Negative Earnings sub-sample				
Actual Persistence from Forecast Equation		Implied Market Persistence from Pricing Equation		Cross Equation Wald Statistic
Coefficient	Estimated Coefficient	Coefficient	Estimated Coefficient	
α_1	0.591**	α_1*	0.396	0.793
	(4.227)		(1.625)	
α_2	0.676**	α_2*	0.033	8.498**
	(6.763)		(0.125)	
		β	0.193**	
			(5.101)	
Adj. R^2	0.229	Adj. R^2	0.038	
Wald Statistic				
$\alpha_1 = \alpha_2$	0.742	α_1*= α_2*	1.417	
(p-value)	(0.389)		(0.234)	
Test of Market Efficiency:	$\alpha_1 = \alpha_1$* and $\alpha_2 = \alpha_2$*			
Likelihood ratio Statistic	147.31**			
(p-value)	(0.000)			

This table reports the joint estimation of forecasting and pricing equations to explore the persistence and pricing of earnings, decomposed into its accruals and future cash flow components. Panel A shows the positive earnings sub-sample (N = 1976 firm-year observations) and Panel B shows the negative earnings sub-sample (N = 1531 firm-year observations). The pair of forecasting and pricing equations, respectively, is given by:

$$EARNINGS_{t+1} = \alpha_0 + \alpha_1 ACCRUALS_t + \alpha_2 FCF_t + \varepsilon_{t+1}$$

$$ARET_{t+1} = \beta[EARNINGS_{t+1} - (\alpha_0^* + \alpha_1^* ACCRUALS_t + \alpha_2^* FCF_t)] + \varepsilon_{t+1}$$

where $EARNINGS_{t+1}$= the earnings of the firm after abnormal items but before extraordinary items in year t+1; $ARET_{t+1}$= the actual return less the expected return based on the size matched portfolio; $ACCRUALS_t$ = EARNINGS – Cash flows from operating activities – cash flows from investing activities; and FCF_t = Cash flow from operating activities + cash flow from investing activities. All variables except ARET are standardised by average assets. t-statistics are reported in parentheses below parameter estimates. Significance at the 1% (5%) level indicated by ** (*).

Panel A (Panel B) for profit-making (loss-making) years. For the profit-making years, the implied persistence coefficient for accruals is positive and significant but for cash flows is insignificant. The results are similar to Sloan (1996) in that the forecasting equation shows that cash flows are more persistent than accruals($\alpha_2 > \alpha_1$), but investors price accruals as more persistent than cash flows ($\alpha_1^* > \alpha_2^*$). The cross-equation Wald tests cannot reject the view that accruals are correctly priced ($\alpha_1^* = \alpha_1$), however for cash flows the test that ($\alpha_2^* = \alpha_2$) is significant at the 10% level. Moreover, the likelihood ratio statistic is significant indicating overall mispricing. For Australian firms making profits, the results are similar to those found by Sloan (1996) in the US and are consistent with rejection of H2.[xii]

Panel B shows that for the loss-making years very different results are found. The implied persistence coefficients for both accruals and cash flows are insignificant[xiii] and the cross-equation Wald test rejects the view that $\alpha_2^* = \alpha_2$. The market clearly underestimates the persistence of FCF_t for firms making losses in the Australian market resulting in significant mispricing of earnings components when earnings are negative.[xiv]

In summary: for profit-making years in Australia the market correctly estimates the persistence of aggregate earnings, but when earnings are disaggregated into accruals and cash flows, the market overestimates the persistence of accruals relative to the persistence of FCF. This is similar to the results of Sloan (1996) and consistent with investors fixating on earnings. For loss-making years in Australia, the market significantly underestimates the persistence of losses and when earnings

are disaggregated into cash flows and accruals the market significantly underestimates the persistence of FCF, especially when FCF is negative.

CONCLUSIONS

In this paper, we investigate the extent to which current earnings, free cash flows and 'accruals' of Australian firms persist into the future (H1). Our results for H1 generally show significant earnings persistence in Australia. This is contrary to the arguments and evidence of Hayn (1995), but is more consistent with recent US evidence on persistent losses in Joos and Plesko (2005). When earnings are decomposed into free cash flows and accruals, we find mixed evident regarding the differential persistence of the components. Thus the evidence supporting H1 is somewhat mixed.

We then investigate whether Australian stock prices correctly reflect the information contained in earnings and its free cash flow and accrual components. H2 predicts that the implied persistence from market pricing will be consistent with the actual persistence of earnings and its components. Results for aggregate earnings show significant mispricing (underpricing) of aggregate earnings for the full sample and the sub-sample of loss years. But for the sample of profit years, the implied persistence and the actual persistence of earnings are not significantly different. This latter result is consistent with Sloan (1996) and with earnings fixation as the explanation for mispricing. The significant underpricing found for all other results is inconsistent with Sloan (1996, correct pricing) and with Dechow *et al.* (2006, overpricing).

When earnings are disaggregated into free cash flow and accruals, the implied persistence from market pricing is significantly different from (less than) the actual persistence for accruals for the full sample. However, the difference is insignificant for all other sub-samples. We find no evidence of overpricing of accruals. This differs from Sloan (1996) and Dechow *et al.* (2006) both of whom find overpricing of accruals. In relation to free cash flows, we find significant underpricing for all samples. Underestimation of the persistence of cash flows is consistent with the results of Sloan (1996), but not with Dechow *et al.* (2006) who find significant overestimation of the persistence of free cash flows by US investors. Additional tests indicate that the mispricing observed in Australia is inconsistent with both earnings fixation and with the agency cost of overvalued equity (Kothari *et al.*, 2006).

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REFERENCES

Australian Accounting Standards Board (2006) "Cash Flow Statements", *AASB 107,* Australian Accounting Standards Board, Australia

Chan, H., Faff, R. & Ramsay, A. (2005) "Firm size and the information content of annual earnings announcements: Australian evidence", *Journal of Business Finance and Accounting*, vol. 32: 211-254

Clinch, G., Fuller, D., Govendir, B. & Wells, P. (2007) "The accrual anomaly: Australian evidence", *UTS Summer Research Conference* 2007

Dechow, P.M. (1994) "Accounting earnings and cash flows as a measure of firm performance. The role of accruals", *Journal of Accounting and Economics,* vol. 18, no. 1: 3 – 42

Dechow, P.M. & Dichev, I.D. (2002) "The quality of accruals and earnings: the role of accrual estimation errors", *The Accounting Review,* vol. 77, supplement:
35 - 59

Dechow, P.M., Kothari, S.P. & Watts, R.L. (1998) "The relation between earnings and cash flows", *Journal of Accounting and Finance,* vol. 25: 133 - 168

Dechow, P.M., Richardson, S.A. & Sloan R.G. (2006) "The persistence and pricing of the cash component of earnings", *working paper*, University of Michigan

Dopuch, N., C. Seethamraju & W. Xu, (2005) "The pricing of accruals for profit and loss firms", available at SSRN: http://ssrn.com/abstract=663514

Fairfield, P. M., Whisenant, J.S. & Yohn, T.L (2003) "Accrued earnings and growth: implications for future profitability and market mispricing", *The Accounting Review,* vol. 78, no. 1: 353 – 371

Francis, J. & Smith, M. (2005) "A re-examination of the persistence of accruals and cash flows", *Journal of Accounting Research,* vol 43, no. 3: 413 – 451

Freeman, R.N., Ohlson, J.A. & Penman, S.H. (1982) "Book rate-of-return and predictions of earnings changes: an empirical investigation", *Journal of Accounting Research,* vol. 20, no 2: 639 - 653

Hayn, C. (1995) "The information content of losses", *Journal of Accounting and Economics* vol. 20: 125-153

Hodgson, A. & van Praag, B. (2006) "Information trading by corporate insiders based on accounting accruals: forecasting economic performance", *Accounting and Finance*, vol. 46: 819-842

Hribar, P & Collins, D.W. (2002) "Errors in estimating accruals: implications for empirical research", *Journal of Accounting Research*, vol. 40, no. 1: 105 - 134

Jensen, M.C. (1986) "Agency costs of free cash flow, corporate finance, and takeovers", *American Economic Review,* vol. 76, no 2: 323 – 329

Jensen, M. C. (2005) "Agency costs of overvalued equity", *Financial Management*, Spring: 5-19

Joos, P. & Plesko, G.A. (2005) "Valuing loss firms', *The Accounting Review*, vol. 80: 847-870

Kothari, S. P., Loutskina, E. & Nikolaev, V. (2006) "Agency theory of overvalued equity as an explanation of the accrual anomaly", available at SSRN: http://ssrn.com/abstract=871750

Lundholm, R. & Sloan, R. (2004) *Equity valuation and analysis with eVal*, Irwin McGraw Hill

Mishkin, F.S. (1983) *A Rational Expectations Approach to Macroeconometrics, Testing Policy ineffectiveness and Efficient-Markets Models,* The University of Chicago Press for the National Bureau of Economic Research, Chicago, USA

Oei, R., Ramsay, A. & Mather, P. (2006) "Earnings persistence, accruals and managerial share ownership", *working paper*

Pincus, M., Rajgopal, S. & Ventatachalam, M. (2007) "The accrual anomaly: international evidence", *The Accounting Review,* vol. 82, no. 1: 169-203

Richardson, S.A, Sloan R.G., Soliman, M.T. & Tuna, I (2005) "Accrual reliability, earnings persistence and stock prices", *Journal of Accounting and Economics*, vol. 39: 437 - 485

Richardson, S. A., Sloan, R.G., Soliman, M.T. & Tuna, I., (2006) "The implications of accounting distortions and firm growth for accruals and profitability", *The Accounting Review,* vol. 81, no. 3: 713-743

Sloan, R.G. (1996) "Do stock prices fully reflect information in accruals and cash flows about future earnings?", *The Accounting Review*, vol. 71, no. 3: 289 – 315

Wu, H. & Fargher, N. (2007) "The implications of accounting distortions, growth and losses for accruals and profitability: Australian evidence", *UTS Summer Research Conference 2007*

Xie, H (2001) "The mispricing of abnormal accruals", *The Accounting Review*, vol. 76, no. 3: 357-373

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[i] Recent unpublished Australian papers on this topic include Clinch *et al.* (2007) and Wu and Fargher, (2007)

[ii] Our definition of free cash flow is consistent with Dechow *et al.* (2006)

[iii] Effectively, we measure accruals as Earnings – FCF, making accruals the residual amount after the FCF have been accounted for. This is done because we want to measure as much of our data as possible using figures highlighted in published financial statements. All cash receipts, cash payment sand cash balance figures are taken directly from the Cash Flow Statement.

[iv] Consistent with Dechow *et al.* (2006) we report results using continuous variables, but to investigate the robustness of the results, the regressions are also estimated using the decile rankings of the variables instead of their actual values. Decile ranks were assigned annually for each of the twelve years in our sample.

[v] Extensive validity checks of these data were applied. These tests were based on testing the relationships implicit in the cash flow statement itself, such as the sum of cash flow from operations, cash flow from investing and cash flow from financing being equal to the net change in cash in the period. Cases in which this relationship did not hold were usually explained by missing data fields in the database, and in very rare circumstances were caused by errors in the actual cash flow statement itself as prepared by the firm and contained in the annual report. The summation of

the financing components being equal to net cash flow from financing was also tested. Firm-years which failed these tests were dropped from the sample.

[vi] There is US evidence of persistence in losses. Joos and Plesko (2005) find that more than 10% of their sample report 10 or more losses over their 30 year sample period. Wu and Fargher (2007) present evidence that losses in Australia are more persistent than profits.

[vii] Wu and Fargher (2007) find that accruals are more persistent than cash flows for firm years reporting losses in the current or next year. Our results do not support the view that accruals are more persistent than earnings for loss years.

[viii] Clinch *et al.* (2007) also find that aggregate earnings are not mispriced in their study of the Australian market.

[ix] Further investigation (untabulated) was conducted by splitting the positive and negative profit samples according to the sign of both ACCRUALS and FCF (Kothari *et al.,* 2006, Dopuch *et al.*, 2005). Overall, positive profit years continued to be correctly priced and negative profit years continued to be mispriced regardless of the sign of these variables.

[x] Results for the pricing equation using decile ranks are essentially unchanged from those reported in Table 3.

[xi] Clinch *et al.* (2007) in their Australian study find there is overall mispricing of accruals and cash flows, but the mispricing seems to involve underestimation of the persistence of cash flows. Hence their results are similar to ours.

[xii] Further investigation (untabulated) was undertaken by splitting the profit years according to the sign of both $ACCRUALS_t$ and FCF_t (Kothari *et al.*, 2006, Dopuch *et al.*, 2005). Results show that firm years with positive earnings and positive accruals show the strongest evidence of the accrual anomaly with the cross-equation Wald test showing significant mispricing of FCF_t. This result could be consistent with earnings management to boost accruals 'misleading' investors.

[xiii] Joos and Plesko (2005) investigate how investors price the (operating) cash flow and accrual components of US loss making firms. They divide firms into persistent and transitory losses and find the market prices accruals but not (operating) cash flows for persistent losses and prices (operating) cash flows but not accruals for transitory losses.

[xiv] Further investigation (untabulated) was conducted by splitting the negative profit sample according to the sign of both ACCRUALS and FCF. Overall, for negative profit years where FCF_t is also negative the market significantly underestimates the persistence of these negative free cash flows resulting in significant mispricing of FCF and significant overall mispricing.