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ACCRUALS AND CASH FLOWS ANOMALIES: EVIDENCE FROM THE NEW ZEALAND STOCK MARKET

ABSTRACT

This paper investigates the presence of accruals and cash flows anomalies in the New Zealand stock market for the period of 1987 to 2003. There is insignificant evidence of accruals anomaly. We find, however, that the poor performance of the highest accruals firms contributes most to the positive hedge return. As earnings are positively associated with accruals, it seems that investors are misled by the high accruals in high earnings firms. Further test results based on discretionary accruals support this hypothesis. We also find strong evidence of cash flows anomaly during the sample period.

JEL classification: G14, M41

Key Words: Accruals, Cash flows, Anomalies

I. INTRODUCTION

The accounting and finance literature provides extensive evidence that the magnitude of accruals (cash flows) component in current earnings is negatively (positively) correlated with future stock return. This anomaly apparently occurs because market participants use current reported earnings to forecast future earnings but seem to be uninformed of the difference in persistence between the accruals and cash flows components of current earnings into future earnings. Accruals are less persistent than cash flows (Bradshaw, Richardson and Sloan (2001) and Barth and Hutton (2004)). Consequently, when current earnings are accompanied by high accruals (cash flows), the persistence of current earnings is low (high) which results in lower (higher) than expected future earnings. When future earnings are lower (higher) than expected, investors react negatively (positively) to the earnings announcements. Thus, the market tends to overprice (underprice) high accrual (cash flow) stocks and underprice (overprice) low accrual (cash flow) stocks. This market fixation on earnings provides an opportunity to profit from an arbitrage investment strategy. A hedge trading strategy, taking a short (long) position in a high accrual (cash flow) firms and a long (short) position in a low accrual (cash flow) firms, would generate a positive and significant abnormal investment return.

The accrual anomaly was first documented by Sloan (1996). Sloan finds that the predictability of stock returns is correlated to the different persistence of the accruals and cash flows components of current earnings. Accruals show mean reversion quicker than cash flows and are negatively correlated with future stock returns. He shows that low (high) accrual stocks generate positive (negative) abnormal future returns and a hedge strategy that exploits this anomaly generates a significant annual abnormal return of 10.4%. Because accruals and cash flows are negatively correlated, Sloan argues that a trading

strategy of simultaneously buying high cash flows stocks and selling low cash flows stocks will also generate a positive abnormal return. He postulates that the cash flow anomaly coexists with the accrual anomaly.

Collins and Hribar (2000) and Houge and Lougran (2000) further provide evidence of the coexistence of the accrual and the cash flow anomaly. Collins and Hribar (2000) report that these two anomalies are robust using quarterly data instead of annual data and are distinct from the post-earnings announcement drift anomaly. Houge and Loughran (2000) show that these two anomalies are robust when applying the three factor model of Fama and French (1993). They report, however, that the characteristics of accrual stocks are different from those of cash flow stocks, and that the accrual anomaly arises primarily from the poor performance of high accrual stocks.

Xie (2001) contends that the accruals mispricing reported in Sloan (1996) can be attributed to the discretionary part of accruals. Xie reports that the market overprices the discretionary part of accruals more than the non-discretionary ones. Discretionary accruals are used synonymously with earnings management in the literature (Kothari (2001)). The mispricing of discretionary accruals (Xie (2001)) combined with the lower persistence of accruals on future earnings (Sloan (1996)) and the poor performance of high accrual stocks (Houge and Loughran (2000)) indicate that the accrual anomaly may arise from earnings management.

Several studies attempt to explain the accrual anomaly. Fairfield, Whisenant and Yohn (2003), for example, argue that accruals are not correlated with future earnings but are highly correlated with the growth of invested assets employed in prior studies to scale future earnings. They suggest that high accruals reflect high unproductive assets. They show that, when the denominator used to scale future earnings is replaced with the same denominator used to scale accruals and cash flows, the magnitude of the coefficients of accruals and

cash flows are statistically equal. They conclude that the persistence of accruals is not lower than that of cash flows and that earnings management is not likely to be the explanation for the accrual anomaly. They conjecture that the reversal effect of accruals is probably due to the diminishing return on investment. Desai, Rajgopal and Venkatachalam (2004) find that cash flows to price ratio captures the effects of the accrual anomaly and they argue that the accrual anomaly is actually the manifestation of the value-glamour anomaly.

Several recent studies, however, support the hypothesis that earnings management explains the lower persistence of accruals. Richardson, Sloan, Soliman and Tuna (2004) examine several hypotheses to explain the lower persistence of accruals on future earnings including the marginal diminishing return hypothesis introduced by Fairfield et al. (2003). Richardson et al. (2004) argue that the estimation error in accruals contributes to the lower persistence of accruals and that the “growth” factor defined in Fairfield et al. (2003) is actually an extension of the definition of accruals in Sloan (1996). Further, Richardson, Sloan, Soliman and Tuna (2005) categorize accruals according to their reliability and find that the accruals mispricing is more severe for the less reliable categories of accruals (working capital accruals and non current operating accruals). However, their findings do not apply worldwide (Pincus, Rajgopal, and Venkatachalam (2005)). Chan, Chan, Jegadeesh and Lakonishok (2005) and Pincus et al. (2005) also examine various explanations for the accrual anomaly and find evidence supporting the earnings management hypothesis.

Kothari, Sabino and Zach (2005) and Kraft, Leone and Wasley (2005), however, find that prior studies on the accrual anomaly suffer from sample selection bias. Kraft et al. (2005) show that the accrual anomaly and the cash flow anomaly are attributed to firms with buy and hold annual returns of more than 200%. After eliminating these outliers, which account for less than 1% of total observations, they find that both low and high accrual portfolios generate negative abnormal returns. Further, the magnitude of the abnormal return of the

accrual strategy is reduced to 1.7%. They also report that the high cash flow portfolio abnormal return is reduced from 3.3% to 1.1%. The abnormal return of the hedge strategy based on cash flows, however, is still positive at 23%.

The accrual anomaly documented in the US is not a global phenomenon. Pincus et al. (2005) examine the presence of the accrual and the cash flow anomalies in 20 countries. They find that the presence of one of these anomalies does not imply the coexistence of the other anomaly. They report that the accrual anomaly, but not the cash flow anomaly, occurs in certain countries (the U.S., the U.K., Canada and Australia), while the opposite is true in 8 other countries. Further, Pincus et al. (2005) report that the accrual anomaly tends to occur in countries with certain institutional and accounting structures. They find that the occurrence of the accrual anomaly is correlated with extensive use of accruals accounting, with a common law tradition, with weak shareholder protections and with low share-ownership concentration.

The present study is motivated by several observations. First, as discussed by Pincus et al. (2005) the occurrence of the accrual anomaly is not a global phenomenon and seems to be correlated with a country's legal system and corporate governance. New Zealand's institutional and accounting structures provide a setting in which the accrual anomaly is likely to occur. New Zealand adopts a common law legal system, allows an extensive use of accruals accounting and has a rather weak shareholders protection apparatus in place (Hung (2001) and Walker (2003)). Particularly, prior to 1993, New Zealand had poor corporate governance due to inadequacies of the then existing legislation (Quigg and Land (1994)). Claims of poor compliance with the NZ accounting standards had also been frequently reported (Bradbury and Zijl (2005)). Although Statements of Standard Accounting Practice (SSAPs) were in place, prior to 1993 there was not sufficient legal backing to the standards. These problems urged New Zealand to review its corporate laws. The Companies Act 1993 enhances directors' duties and increases directors' responsibilities (Seebold

(1993) and Quigg and Land (1994)) and The Financial Reporting Act 1993 (FRA93) was introduced to provide a legal backing to ensure that financial reports are made in compliance with the accounting standards. We would, as a spin-off of our investigation, test the impact of these regulations on the presence of accrual in New Zealand. Accounting environment is very similar to that of Australia where accruals mispricing is reported (Pincus et al. (2005)). To the best of our knowledge, this is the first study investigating presence of the accrual anomaly in New Zealand. As the accrual anomaly is a contradiction to the widely believed efficient market hypothesis, evidence from a different country that confirm the existence or non-existence of this anomaly would contribute to the existing literature and could benefit New Zealand investors.

Second, Pincus et al. (2005) also report primarily descriptive evidence that the occurrence of accruals mispricing does not imply cash flows mispricing to occur, or vice versa. The lack of cross-country evidence on the coexistence of the accrual and the cash flows anomalies cast doubt on the coexistence hypothesis of the two anomalies. As the characteristics of the accruals-based portfolios are different from those of cash flows-based portfolios (Houge and Loughran (2000)), this evidence suggests that the two anomalies, although accruals and cash flows are negatively correlated, may not arise exactly from the same reason. Therefore evidence on the (non-) coexistence of these anomalies would indicate whether these anomalies arise both from the same cause, or each from a different cause.

Finally, since the accrual anomaly is correlated with earnings management, evidence on this anomaly would also benefit regulators of financial reporting in New Zealand by providing insights on the value relevance of the firms' financial statements.

This paper employs data from 1987 to 2003 and applies a data-selection procedure similar to that suggested by Kraft et al. (2005). Contrary to prior

studies, we find that, on average, accruals are not associated with future returns. The abnormal return based on the accrual strategy, although positive at 2.56%, is not statistically significant. The abnormal return of high accrual firms is significantly negative at -4.13% while the abnormal return of low accrual firms is negative but statistically insignificant at -1.57%. Thus, the positive abnormal return from the accrual strategy arises mostly from high accrual firms. The significantly negative abnormal return of the high accrual stocks indicates that investors overvalue accruals in high earnings firms. Further, we find a similar abnormal return pattern when we sort firms based on several discretionary accruals models. As discretionary accruals are positively correlated with firms' earnings, the negative stock return of the high accruals firms gives support to the earnings management hypothesis.

Sorting firms based on the magnitude of cash flows, however, presents a different picture. Cash flows are positively and significantly related to future returns. The average abnormal return of high (low) cash flow firms is significantly positive (negative). A hedge strategy, simultaneously taking a long position in the high cash flow portfolio and a short position in the low cash flow portfolio, generates a significant positive abnormal return of 16%. It is further observed that the characteristics of cash flow-sorted portfolios are different from those based on accruals. Both extreme accrual portfolios consist of small firms while only the low cash flows firms consist of small firms.

The rest of the paper is organised as follows. In section 2 we formulate the hypotheses to be tested, and describe the sample selection process and describe the research method. The results are reported in section 3. We conclude the paper in section 4.

2. RESEARCH DESIGN

2.1. Hypothesis

Prior studies on the accrual anomaly report that market participants do not take into account the difference between the persistence of accruals and the persistence of cash flows in current earnings when predicting future earnings (Sloan (1996) and Bradshaw et al. (2001)). Instead, they focus only on current earnings and are “surprised” when future earnings performance is lower (higher) than expected. Sloan (1996) and Bradshaw et al. (2001) examine the relation between future earnings and the components of current earnings. They find that both coefficient of accruals and cash flows are significant between 0 and 1 which mean that the two components contribute to the mean reversion of earnings. The coefficient of accruals, however, is smaller than that of cash flows indicating that the mean reversion of accruals is faster than for cash flows.

Current earnings performance, when accompanied by high accruals, therefore sees a quicker mean reversion than when accompanied by high cash flows. As a result, firms with high earnings attributed to high accruals (cash flows), *ceteris paribus*, will end up with lower (higher) future earnings. The accrual anomaly arises because investors do not price the different persistence of accruals and cash flows. Therefore, to examine the presence of the accrual anomaly, our first hypothesis is:

H1: The performance of current earnings that is mainly attributed to accruals is less persistent than when it is mainly attributed to the cash flows component of earnings.

The accrual anomaly arises because the market incorrectly prices accruals and cash flows as if they have the same persistence on future earnings. As accruals are less persistent than cash flows, the market seems to overprice (underprice) accruals (cash flows). Therefore our second hypothesis is:

H2: The market overprices (underprices) the accruals (cash flows) component.

When future earnings are unexpectedly lower (higher) the market reacts negatively (positively) to the earnings announcement. The higher the accruals component in current earnings, the bigger the earnings surprise and the more negative is the market's reaction to the earnings surprise.

Sloan (1996) suggests that, because accruals and cash flows are negatively correlated, the accrual strategy can also be expressed in terms of the magnitude of cash flow. Empirical evidence on his conjecture, however, is mixed. Houge and Loughran (2000) and Collins and Hribar (2000) find that the magnitude of cash flows and accruals are respectively positively and negatively correlated with future stock return. Pincus et al. (2005), however, find that the occurrence of the accrual anomaly in a country does not always imply that the cash flow anomaly coexists, or vice versa. They find the accrual anomaly is present in the US, the UK, Canada and Australia, but find no evidence of the presence of the cash flow anomaly in these countries. On the other hand, they do not find the accrual anomaly in other countries in their sample but instead find the presence of the cash flow anomaly. This evidence shows that the cash flow anomaly is more pervasive across different countries. Their results also indicate that the two anomalies may not coexist. Thus, third and fourth hypotheses are:

H3: Future stock returns are negatively related to accruals in current earnings

H4: Future stock returns are positively related to cash flows in current earnings

The predictive association between accruals (and cash flows) and future stock return then creates an arbitrage investment opportunity and leads us to our fifth and sixth hypotheses:

H5: A trading strategy that takes a long position in the portfolio of low accruals firms and a short position in the portfolio of high accruals firms generates a positive abnormal return.

H6: A trading strategy that takes a long position in the portfolio of high cash flows firms and a short position in the portfolio of low cash flows firms generates a positive abnormal return.

2.2. Data

This study is conducted using all non financial firms listed on the New Zealand Stock Exchange with available data in the Datasream and the 2004 Datex financial company report files. We delete firm-year observations that have insufficient data for the calculation of accruals as defined below as well as firms that change their fiscal year ends. The sample period is from 1987 to 2003. This process results in a sample of 1,202 firm year observations with the required financial statement and share price data. In order to avoid any data errors and the effects of outliers as in prior studies, we delete from the sample those stocks with annual buy and hold returns of more than $\pm 100\%$. The final sample is 1,127 firm-year observations.

2.3. Methodology

Richardson et al. (2005) find that the less reliable accruals contribute most to the lower earnings persistence. The degree of the accruals reliability is measured using a balance sheet approach. The problem with this approach is that when non-articulation events such as mergers and acquisitions and discontinued operations occur, the parameter estimates are biased toward the existence of earnings management (Collins and Hribar (2002)). As mergers and acquisitions

take place commonly in New Zealand (Peart (2003)), deleting observations related to the takeover events will significantly reduce the sample size of this study. Collins and Hribar (2002) further demonstrate that computing accruals directly from statements of cash flows is a more precise measure of accruals and avoid measurement errors in estimating accruals using the balance sheet approach. This approach has been acknowledged and employed extensively in the literature (Subramanyam (1996), Teoh, Welch and Wong (1998a and 1998b), Collins and Hribar (2000), Klein (2004), Desai et al. (2004), Chan et al. (2005), Pincus et al. (2005) and Coulton, Taylor and Taylor (2005)). Furthermore, the mispricing of the less reliable accruals seems to be specific only to the U.S., the U.K. and Australia data (Pincus et al. (2005)). Accordingly, we use the cash flows approach to measure accruals. Accruals are calculated as the difference between earnings and operating cash flows. Operating cash flows data are obtained from the statements of cash flows. We measure earnings as operating income after depreciation but before interest expense, taxes and special items. All the three variables (earnings, cash flows and accruals) are standardized by the average of the beginning and end of the fiscal year book value of total assets.

Firm statements of cash flows prior to 1991 are not available from Datex¹. Therefore, for periods 1987 to 1991, this study applies a balance sheet approach (as employed in Sloan (1996), Houge and Loughran (2000) and Desai et al. (2004)) in computing accruals²:

$$Accruals = (\Delta CA - \Delta Cash) - (\Delta CL - \Delta STD - \Delta TP) - Dep \quad (1)$$

ΔCA is the change in current assets. $\Delta Cash$ is the change in cash or cash equivalent. ΔCL is the change in current liabilities. ΔSTD is the change in debt

¹ Although SSAP 10 explicitly requires firms to report this statement, poor legal backing results with poor compliance with the accounting standard (Bradbury and Zijl (2005)). This problem was resolved with the introduction of the Financial Reporting Act 1993 that requires firms to include a cash flow statement in their financial reports.

² The results, not reported but available from the authors, are similar when we deleted data prior to 1991 and redid the analysis based on only the accruals calculated based on statements of cash-flow.

included in current liabilities. ΔTP is the change in tax payables, and Dep is the depreciation and amortization expense.

Following Sloan (1996) we use a model that estimate the average persistence of current earnings on future earnings and another model that does not restrict the accruals and cash flows components of current earnings to be equal to examine the different persistence of accruals and cash flows components of current earnings.

$$Earnings_{t+1} = \alpha_1 + \alpha_2 Earnings_t + \varepsilon_{t+1} \quad (2)$$

$$Earnings_{t+1} = \alpha_1 + \beta_1 Cashflows_{it} + \beta_2 Accruals_{it} + \varepsilon_{t+1} \quad (3)$$

Model (2) estimates the average persistence of current earnings on future earnings. The accrual anomaly arises from the different persistence of accruals and cash flows components of earnings. Model (3) breaks current earnings into accruals and cash flows components of earnings. The smaller the component from the other, the faster it is to mean revert, indicating less persistent of the component.

To test the market's pricing on accruals and cash flows we employ the Mishkin (1983) tests and the hedge portfolio test. These tests have been frequently used in studies on the accrual anomaly (Sloan (1996), Collins and Hribar (2000), Xie (2001) and Pincus et al. (2005)) to examine whether the market efficiently prices the accruals and the cash flows components of earnings.

Mishkin Test

Mishkin (1983) provides a framework to test for accrual anomaly. As in prior studies, we estimate the following jointly regressions:

$$Earnings_{t+1} = \alpha_1 + \beta_1 Cashflows_{it} + \beta_2 Accruals_{it} + \varepsilon_{t+1} \quad (4a)$$

$$AR_{t+1} = \gamma_1 (Earnings_{t+1} - \alpha_1 - \beta_1^* Cashflows_{it} - \beta_2^* Accruals_{it}) + v_{t+1} \quad (4b)$$

AR is a stock's abnormal return defined as the difference between the stock return and the size matched portfolio return. The idea is to figure out if investors assign a higher valuation coefficient to accruals than the one expected in the association between accruals and future earnings. If markets are efficient, we should expect the two coefficients not to be statistically different from each other. Accruals (cash flows) mispricing is observed if the market assigns a significantly larger or smaller coefficient than implied in the association between accruals (cash flows) and future earnings.

The Mishkin (1983) test is carried out first by estimating regressions jointly using an iterative weighted nonlinear least squares method to obtain the coefficient estimates. Then the joint regressions are re-estimated by imposing the constraints $\beta_p = \beta_p^*$. We test this by using a likelihood statistic ratio which is asymptotically $\chi^2(q)$ distributed:

$$2 \cdot N \cdot \ln \left(\frac{SSR^c}{SSR^u} \right) \quad (5)$$

N = number of observation

q = number of restrictions

SSR^c = sum of squared residuals of the constrained regression

SSR^u = sum of squared residuals of the unconstrained regression

Hedge portfolio test

We group stocks into five categories based on the magnitude of accruals and cash flows. Stock returns are computed as the buy and hold returns that are measured beginning from four months after the end of the firms' fiscal years. Prior studies find that although more than one year ahead abnormal stock returns are positive, these returns are not significantly different from zero. Furthermore,

the inclusion of more than one year ahead stock returns will decrease the sample size of this study. Therefore, future stock return is examined only as a one year ahead stock return. These portfolios are rebalanced every year. To generate the benchmark portfolio returns, five equally weighted portfolios are constructed based on the size or market value of the firms. The buy and hold returns of these portfolios are calculated within each group. Following similar studies on the accrual anomaly, the abnormal stock return is defined as the difference between the stock return and the size matched portfolio return:

$$AR_{it} = R_{it} - R_{pt} \quad (6)$$

AR_{it} is the size adjusted returns of stock i , R_{it} is the raw return of the individual stock and R_{pt} is the size matched portfolio return.

3. EMPIRICAL RESULTS

3.1. *The accrual and the cash flow anomalies*

As reported in Panel A of Table 1, the coefficient of current earnings in model (2a) is between 0 and 1 indicating that current earnings is mean reverting. Pincus et al. (2005) report the cross-country range of mean reversion of earnings is between 0.6 and 0.8. The mean reversion of NZ firms' earnings is within the mean range ($\alpha_2 = 0.71$). Results in panel B of Table 1 show that both accruals and cash flows components of current earnings significantly explain future earnings. The coefficient of accruals (0.54) is however smaller than the coefficient of cash flows (0.94) and less than unity which means that accruals are mean reverting faster than cash flows. An F test confirms that the coefficient of accruals is smaller than the coefficient of cash flows. This evidence supports the hypothesis that accruals are less persistent than cash flows in shaping future earnings.

Panel A. $Earnings_{t+1} = \alpha_1 + \alpha_2 Earnings_t + \varepsilon_{t+1}$

\square_I	\square_\square	Adj. R ² %
0.00 (0.49)	0.71 (20.62)***	30.76

Panel

B. $Earnings_{t+1} = \alpha_1 + \beta_1 Cashflows_t + \beta_2 Accruals_t + \varepsilon_{t+1}$

\square_I	\square_I	\square_\square	Adj. R ² %
-0.01 (-1.78)	0.95 (20.26)***	0.54 (13.23)***	34.25
F test: $\square_I \square_I \square_\square$		47.71	
p-value		0.000***	

Table 1: The Persistence of Accruals and Cash Components of Earnings

The dependent variable is one year ahead earnings, the explanatory variables are cash flows and accruals. Earnings are measured as operating income after depreciation but before interest expense, taxes and special items. Cash Flows are operating cash flows. Accruals are the difference between earnings and cash flows. All variables are deflated by average total assets. Sample consists of 956 firm years observations from 1987 to 2003. Two-tail t statistics are in parentheses.

*** significant at 1%

The results from the Mishkin test reported in Table 2 indicate that on average the NZ market underprices both accruals ($\beta_2 > \beta^*_2$) and cash flows component of earnings ($\beta_1 > \beta^*_1$). The underpricing of both accruals and cash flows is not unique to New Zealand, as reported by Pincus et.al (2005) do occur in other countries as well.

Panel A of Table 3 provides statistics of five portfolios of stocks sorted by the magnitude of accruals. Earnings are positively correlated with accruals but cash flows are negatively correlated with accruals. The average annual correlation between accruals and cash flows however, is weak, only -0.22. The magnitude of this correlation is much lower than that reported in prior studies which is typically more than -0.5.

$$Earnings_{t+1} = \alpha_1 + \beta_1 Cashflows_{it} + \beta_2 Accruals_{it} + \varepsilon_{t+1}$$

$$AR_{t+1} = \gamma_1 (Earnings_{t+1} - \alpha_1 - \beta^*_1 Cashflows_{it} - \beta^*_2 Accruals_{it}) + v_{t+1}$$

	β_1	β^*_1	β_2	β^*_2
	0.94	0.14	0.54	0.30
L: $\beta_1 = \beta^*_1$	2.75 (0.0973)*			
L: $\beta_2 = \beta^*_2$			27.30 (0.000)***	

Table 2: Results from the Iterative *Weighted* Non-linear Least Squares Regressions of the Stock Price Reaction to Information in the Components of Current Earnings

Earnings are measured as operating income after depreciation but before interest expense, taxes and special items. Cash Flows are operating cash flows. Accruals are the difference between earnings and cash flows. Abnormal return is computed as the stock's buy and hold annual raw return minus the size-matched buy and hold annual portfolio return. Sample consists of 956 firm years observations from 1987 to 2003. $L = 2 \cdot n \cdot \ln(SSR^c / SSR^u)$. SSR^c is the sum of square residuals of the constrained regression. SSR^u is the sum of square residuals of the unconstrained regression. p -values are in parentheses.

* significant at 10%

*** significant at 1%

The inverted “U” shape pattern in the market value of the firms sorted by accruals shows that the two extreme portfolios consist of small stocks. A hedge portfolio strategy taking a long position in the low accrual portfolio and a short position in the high portfolio should therefore eliminate the size-risk factor of the strategy.

The average abnormal return from the hedge strategy during the sample period is positive at 2.56% per year but insignificant. The positive hedge return is derived mainly from the negative return of the high accrual portfolio. The abnormal return of the high accrual portfolio is negative at -4.13% and statistically significant, while the abnormal return of the low portfolio is -1.57% and statistically insignificant. Furthermore, the abnormal returns are weakly correlated with the order of the quintile portfolios. This confirms that the positive abnormal

return of the accrual strategy is mainly due to the poor performance of firms reporting high accruals (Houge and Loughran (2000)) and that the abnormal returns of both extreme accrual portfolios after excluding the outliers are negative (Kraft et al. (2004)).

Panel A. Sorted by Total Accruals

Portfolio	Lowest	2	3	4	Highest
Earnings	-0.10	0.06	0.08	0.11	0.14
Cash Flows	0.12	0.10	0.08	0.07	-0.02
Accrual	-0.22	-0.04	0.01	0.04	0.17
Size	85.16	206.12	183.38	183.32	112.99
B/M	1.14	1.28	1.45	1.13	0.99
Raw Return	-2.15%	5.21%	2.82%	3.25%	4.90%
AR	-1.57% (-0.63)	3.77% (1.71)*	0.85% (0.44)	1.03% (0.53)	-4.13% (-1.90)*
Hedge Return	2.56% (0.55)				

Panel B. Sorted by Discretionary accrual

Raw Return	-0.11%	6.31%	1.39%	0.17%	-3.67%
AR	0.91% (0.37)	4.36% (2.01)**	-0.39% (-0.19)	-1.00% (-0.54)	-3.85% (-1.73)*
Hedge Return	4.76% (1.01)				

Panel C. Sorted by Non Discretionary Accruals

Raw Return	-2.09%	3.26%	1.92%	-0.81%	2.45%
AR	-2.69% (-1.06)	2.29% (1.14)	-0.15% (-0.07)	-1.75% (-0.82)	2.22% (1.09)
Hedge Return	-4.91% (-1.07)				

Table 3: Average of Firm Variables Sorted by Accruals

Earnings are measured as operating income after depreciation but before interest expense, taxes and special items. Cash Flows are operating cash flows. Accruals are the difference between earnings and cash flows. All variables are deflated by average total assets. Size is market value of firms' equity and B/M is the Book equity/Market value of firms' equity. Book equity is total asset minus total liabilities. Return is defined as the buy and hold return calculated from 4 months after the end of the firm fiscal year. Sample consists of 1,127 firm years observations from 1987 to 2003. Two-tail t statistics are in parentheses.

* significant at 10%

** significant at 5%

Figure 1 shows that the accrual strategy generates positive abnormal returns in only 9 (53%) of 17 years during the sample period. The highest positive return is 53.15% in 1991 and the lowest abnormal return is -16.15% in 1989. This evidence shows that the extensive use of accruals in an accounting system and a country's legal tradition may not always be indicative of the possibility of occurrence of the accrual anomaly in a particular country as suggested by Pincus et.al. (2005)

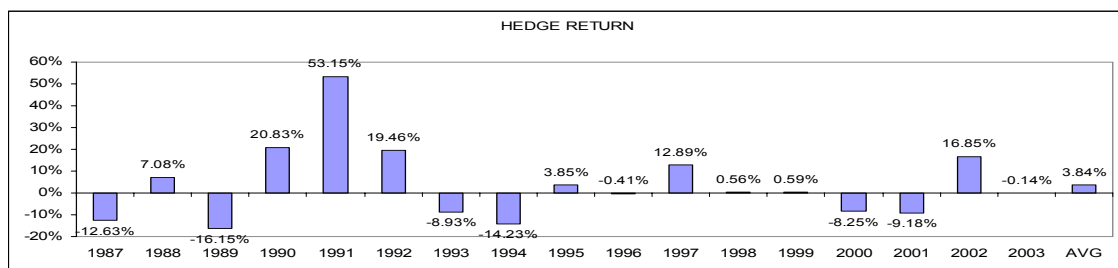


Figure 1: Abnormal returns of the trading strategy based on accruals by calendar year

Abnormal returns are firms' size adjusted returns. The strategy's abnormal returns are based on going long on the lowest accrual portfolio and short on the highest accrual portfolio. Accruals are the difference between earnings and cash flows. All variables are deflated by average total assets. Sample consists of 1,127 firm years observations from 1987 to 2003.

The significant abnormal return of the high accrual portfolio indicates that investors overvalue high accrual stocks. Indeed, when we apply the Mishkin test on high accrual stocks, we find that the market significantly overprices accruals in the high accrual portfolio³. Panel A of Table 3 shows that firms with high accruals are also firms with high earnings. As the investors seem to overvalue high accrual stocks, the poor performance of the high accrual portfolio provides a preliminary indication that when high earnings are accompanied by high accruals, managers of these firms engage in income increasing accruals.

To investigate the possibility of income increasing management, we sort portfolios into discretionary and non discretionary accruals. We employ the cross

³ Results are not reported but available from the authors and they are significant at the conventional level of 5%.

sectional modified Jones model (Dechow, Sloan and Sweeney (1995)) to partition the discretionary accruals from total accruals:

$$TA = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_t - \Delta REC_t}{A_{t-1}} \right) + \alpha_3 \left(\frac{PPE_t}{A_{t-1}} \right) + \phi_t \quad (7)$$

TA is accruals, A is total assets, ΔREV is the change in revenues, ΔREC is the change in account receivables and PPE is property plant and equipment. The nondiscretionary accruals are the fitted values and the discretionary accruals are the residuals of the model.

Although the modified Jones model is not perfect in separating discretionary and nondiscretionary accruals from total accruals, this model is widely used in the earnings management literature and is the most practical alternative available (Dechow, Sloan and Sweeney (1995) and Guay, Kothari and Watts (1996)). The cross-sectional modified Jones model is chosen instead of the time series Jones model because the parameter estimates obtained from the cross sectional version of the modified Jones model are specified better and do not suffer from the “look ahead” bias as in the time series version (Subramanyam (1996) and Bartov, Gul and Tsui (2000)). In addition, few NZ firms have long historical data. Hence the cross sectional Jones model generates a larger sample and the power of the tests in this study.

The results in Panel B and C of Table 3 support the manipulation hypothesis. The abnormal return pattern across quintile portfolios sorted by discretionary accruals is similar to that of based on total accruals. The abnormal return of the low (high) accrual portfolio is positive (significantly negative) at 0.9%

$(-3.85\%)^4$. When portfolios are sorted by nondiscretionary accruals, the pattern of the portfolios' abnormal returns is inconsistent with that of total accruals.

Evidence reported in Table 4 shows that on average accruals have a weak association with the abnormal returns. Accruals are insignificantly correlated with the stock returns. Current earnings are significantly and positively associated with the stocks' abnormal returns. This significant correlation derives from cash flows which are significantly and positively related to the stocks' abnormal returns. A Robustness test using Fama Mac-Beth regressions in Table 5 is consistent with these results.

As discussed earlier, the Financial Reporting Act 1993 (FRA93) was introduced to provide a legal backing to ensure that financial reports are made in compliance with the accounting standards. Based on visual inspection of Graph 1, after 1992, the accrual anomaly hardly exists during the sample period. To test the effects of these regulations, we repeat our analysis on the accrual anomaly from 1993 to 2003. We find that all the abnormal returns of the two extreme accruals portfolios and the hedge accrual strategy are negative and insignificant. This evidence gives some support to the notion that these acts have significant impact on the accrual anomaly.

⁴ Coulton et al. (2005) suggest adding the lagged of total accruals into the modified Jones model to capture the reversal effect of accruals. Therefore, we repeat the analysis with the lagged modified Jones model. The lagged modified Jones model:

$$TA = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_t - \Delta REC_t}{A_{t-1}} \right) + \alpha_3 \left(\frac{PPE_t}{A_{t-1}} \right) + TA_{t-1} + \phi_t \quad (8)$$

We find that the hedge abnormal return of portfolios sorted based on the lagged modified Jones model is also positive at 3.03% and insignificant, and the pattern of the abnormal returns is also similar to that of previous analysis using the modified Jones model, the results are not reported but are available from the authors.

Intercept	Earnings	Accruals	Cash Flows	Adj. R ² %
-0.01 (-0.45)	0.14 (3.84)***			1.27
-0.03 (-0.91)		0.04 (0.76)		0.03
-0.02 (-0.72)			0.22 (4.48)***	1.74
-0.02 (-0.58)		0.05 (0.92)	0.22 (4.51)***	1.72

Table 4: The Association between Returns and The Components of Earnings

The dependent variable is one year future abnormal return, the explanatory variables are earnings, cash flows, accruals, book to market ratio and ln market value of assets (not reported). Earnings are measured as operating income after depreciation but before interest expense, taxes and special items. Cash Flows are operating cash flows. Accruals are the difference between earnings and cash flows. All variables are deflated by average total assets. Sample consists of 1,127 firm years observations from 1987 to 2003. Two-tail t statistics are in parentheses.

*** significant at 1%

Accruals	Cash Flows
0.01 (0.17)	
	0.31 (5.18)***

Table 5: Fama-MacBeth Regressions: Size-Adjusted Returns and The Components of Earnings

The dependent variable is one year future abnormal returns, the explanatory variables cash flows and accruals. Cash Flows are operating cash flows. Accruals are the difference between earnings and cash flows. All variables are deflated by average total assets. Sample consists of 1,127 firm years observations from 1987 to 2003. Two-tail t statistics are in parentheses.

*** significant at 1%

Addressing the cash flow anomaly, Table 6 presents summary statistics of firms sorted by the magnitude of their cash flows. Earnings are positively (negatively) correlated with cash flows (accruals). Firms in the low (high) cash flow portfolio exhibit the lowest (highest) performance in future returns. Consistent with Houge and Loughran (2002), we find that the profile of portfolios based on cash flows is different from that based on accruals. The low cash flow

portfolio consists of small stocks while the high cash flow portfolio consists of big stocks. The average abnormal return in the low (high) cash flow portfolio is negative (positive) at -9% (6%) and statistically significant. The average return of the hedge strategy is around 16% and statistically significant. Furthermore, the relation between the magnitudes of cash flows and the abnormal returns is more stable. The average abnormal return is generally increasing according to the order of the quintile portfolios.

Portfolio	Lowest	2	3	4	Highest
Earnings	-0.12	0.05	0.08	0.11	0.17
CF	-0.15	0.03	0.08	0.12	0.24
Accrual	0.03	0.02	0.01	-0.01	-0.07
Size	48.72	142.74	195.91	235.35	147.25
B/M	1.26	1.50	1.42	0.98	0.83
Raw Return	-11.62%	-1.84%	5.76%	3.18%	8.60%
AR	-8.82% (-3.77)***	-1.70% (-0.71)	3.01% (1.60)	0.86% (0.45)	6.35% (2.99)***
Hedge Return	15.84% (3.55)***				

Table 6: Average of Firm Variables Sorted by Cash Flows

Earnings are measured as operating income after depreciation but before interest expense, taxes and special items. Cash Flows are operating cash flows. Accruals are the difference between earnings and cash flows. All variables are deflated by average total assets. Size is market value of firms' equity and B/M is Book equity/Market value of firms' equity. Book equity is total asset minus total liabilities. Return is defined as the buy and hold return calculated from 4 months after the end of the firms' fiscal years. Sample consists of 1,127 firm years observations from 1987 to 2003. Two-tail t statistics are in parentheses

*** significant at 1%

The abnormal returns of the cash flow strategy are positive in 14 (82%) of 17 years during the sample period (Figure 2). The highest return is 44.38% in 2000 and the lowest return is -10.24% in 1987 which may be attributed to the stock market crash in October 1987.

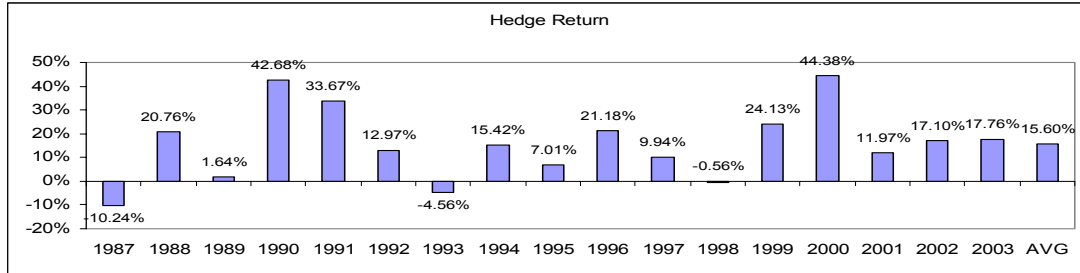


Figure 2: Abnormal returns of the trading strategy based on cash flows by calendar year

Abnormal returns are firms' size adjusted returns. The strategy's abnormal returns are based on going long on the highest cash flow portfolio and short on the lowest cash flow portfolio. Cash flows are the operating cash flows obtained from the statements of cash flows. Sample consists of 1,127 firm years observations from 1987 to 2003.

3.2. Robustness Tests

The positive abnormal returns of the cash flows portfolios in almost all of the calendar years across the sample period (Figure 3) suggest that investors underweight the persistence of the cash flows component of current earnings. However, these positive abnormal returns may also reflect other unidentified risk factors.

Fama and French (1992 and 1993) report that beta, size and the book to market ratio explain most of the cross sectional variation in portfolio returns. They argue that their asset pricing model captures the cross sectional returns attributed to systematic, size and book to market ratio risk factors. The Fama and French three-factor model is:

$$r_{pt} - r_{ft} = \alpha_0 + \beta_1(r_{mt} - r_{ft}) + \beta_2SMB + \beta_3HML + \varepsilon_{pt} \quad (9)$$

r_{pt} is stock return of portfolio p in month t. r_{ft} is the risk free rate in month t. r_{mt} is the market return in month t. SMB is the size factor (small minus big) in month t. HML is book to market (high minus low) factor in month t. The intercept, α_0 , measures average monthly abnormal return of the portfolio in year t+1. To get the annualized abnormal return, α_0 is multiplied by 12.

The significant abnormal returns of the high and low cash flow portfolio may be attributed to these three risk factors. To test this hypothesis, we construct equally weighted monthly time series cash flow portfolios beginning from July in year t and held until June in year $t+1$. The median size of NZSE firms is used to split stocks into small and big portfolios. We also sort firms based on their book to market ratios and classify the bottom (top) 30% as the low (high) book to market portfolio. The 1-month bank bill rate is employed as the risk free rate. We then run the three factor model for each quintile of cash flow portfolio. As the market index, the NZSE All, is available only from 1990, the sample period for this test is from 1990 to 2003.

Table 7 shows the results of the three-factor model for the cash flows-based portfolios. Similar to previous results, the abnormal returns of cash flow portfolios 2 to 4 are not statistically significant. Beta, size and the book to market ratio significantly explain the cross sectional variation of these portfolio returns.

However the abnormal returns of the two extreme cash flow portfolios are still robust after controlling for these three risk factors. The monthly average abnormal return of the low (high) cash flow portfolio is negative (positive) at -0.99% (0.83%) or -11.85% (9.94%) annually and statistically significant. Buying high and selling low cash flow portfolio strategy during the sample period generates a significant average monthly abnormal return of 1.82% or 21.79% annually⁵.

⁵ Carhart (1997) argues that adding a factor representing one-year momentum in stock returns factor into the Fama and French three factor model better explains the variation in stock returns. We, therefore, repeat the analysis using the Carhart four-factor model. The results are similar to the results using the three-factor model.

$$r_{pt} - r_{ft} = \alpha_0 + \beta_1(r_{mt} - r_{ft}) + \beta_2\text{SMB} + \beta_3\text{HML} + \varepsilon_{pt}$$

Portfolio	α_0	β_1	β_2	β_3	Adj. R ² %
Low	-0.01 (-2.24)**	0.98 (9.84)***	0.31 (3.70)***	0.13 (1.24)	43.31
2	0.00 (-0.26)	0.79 (13.98)***	-0.06 (-1.28)	0.11 (1.97)**	54.05
3	0.00 (1.59)	0.99 (16.59)***	-0.16 (-3.21)***	0.14 (2.25)**	62.26
4	0.00 (1.67)*	0.87 (17.64)***	-0.17 (-4.23)***	0.14 (2.70)***	65.28
High	0.01 (3.48)***	0.89 (16.66)***	-0.12 (-2.64)***	0.04 (0.76)	62.19
Hedge Return	0.02 (3.52)***	-0.09 (-0.73)	-0.42 (-4.38)***	-0.08 (-0.71)	11.97

Table 7: Monthly Time Series Regressions of Buy and Hold Returns of Equally Weighted Cash Flow Portfolios on Market Risk, Size and Book to Market Ratio

Stocks are ranked based on the magnitude of operating cash flows scaled by average total assets. Equally weighted cash flow portfolios are formed on July of year t until June of year t+1. The sample period is from 1990 to 2003. A Fama and French 3 factor model is conducted for each quintile portfolio. R_{pt} is stock return of portfolio p in month t. R_{ft} is 1-month bank bill rate. R_{mt} is the market (NZSX All) return in month t. SMB is size factor (small minus big) in month t. HML is book to market (high minus low) factor in month t. Two-tail t statistics are in parentheses.

* significant at 10%

** significant at 5%

*** significant at 1%

4. SUMMARY

We do not observe a significant accrual anomaly in New Zealand during the sample period under investigation. Consistent with Kraft et al. (2005), after correcting the outliers, the abnormal returns of both extreme accrual portfolios are negative and the hedge abnormal return is, although positive, statistically insignificant. Firms with high accruals in their reported earnings however experience significant negative future stock returns. The significantly negative abnormal return of the high accrual portfolio explains most of the positive hedge

abnormal return of the accrual hedge strategy. This evidence indicates that the market overvalues the persistence of high earnings when accompanied by high accruals. Further tests on discretionary accruals support this hypothesis.

We find strong evidence of the presence of the cash flow anomaly. The magnitude of cash flows is positively and significantly associated with future stock returns. The abnormal return of the low cash flow portfolio is negative and significant, while the abnormal return of the high cash flow portfolio is significantly positive. A corresponding cash-flow based trading strategy generates positive returns in 14 (82%) of the 17 years period.

There are several reasons, however, that New Zealand investors may not fully benefit from exploiting this anomaly. First, the prohibition of short selling in New Zealand prevents the use of the hedge strategy and as a result reduces the abnormal return of the strategy. Second, even though buying only high cash flows stocks still generates a positive and significant average abnormal return of 6.35%, firms in the sample have different fiscal periods. As a result, the hedge strategy requires portfolios to be constructed more than once in a given year. The information acquisition and the processing costs to implement this strategy would limit the benefit of the trading strategy.

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