Asset revaluation and future firm operating performance: evidence from New Zealand

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The regulatory framework of many countries allows the upward revaluation of assets. Previous studies on the association of asset revaluation and future performance in Australia (Barth and Clinch, 1998), U.K. (Aboody, Barth and Kasznik, 1999) and Hong Kong (Jaggi and Tsui, 2001) have shown that upward asset revaluations are positively associated with the firm’s operating performance, suggesting that asset revaluations are value relevant. This study extends the previous research by focusing on the New Zealand environment with recent data to examine the association of upward asset revaluation and future operating performance. There is no obvious evidence indicating that upward revaluations are associated with operating performance in New Zealand. Our market assessments show that current year asset revaluations are related to share prices and returns, but are not statistically significant.

Keywords: Upward asset revaluation, operating income, cash flows from operations, future operating performance
I wish to thank my supervisors Dr. Ahsan Habib and Murray Clark for their assistance, guidance and supervision in the production of this thesis. Many thanks also to Dr James Ross, for his patient and humorous advice on all matters statistical.

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Chapter 1: Introduction

1.1 Introduction

Concern about the value relevance of financial information has motivated research into factors which are associated with asset revaluations in the UK (Aboody, Barth and Kasznik, 1999), Hong Kong (Jaggi and Tsui, 2001), Australia (Brown et al., 1992; Henderson and Goodwin, 1992; Easton Eddey and Harris, 1993; Cotter and Zimmer, 1995; Barth and Clinch, 1998; Lin and Peasnell, 2000) and New Zealand (Cahan, Courtenay, Gronewoller and Upton, 2000; Courtenay and Cahan, 2004). Previous studies found evidence that supports the view that investors value information about the revaluation of non-current assets.

1 The author gratefully acknowledges the support of the Investment Research Group (IRG) Ltd for their assistance in the data collection.

2 “Asset revaluation” in this paper refers to “upward asset revaluation”. We use the term “revaluation” to refer to recognized revalued amounts associated with assets that have been revalued.
Aboody et al., (1999) in the UK and Jaggi and Tsui (2001) in Hong Kong both found that there was a positive association between upward fixed asset revaluation and the firm’s future operating performance. Additionally, they found that upward fixed asset revaluations were positively associated with share prices and returns. In New Zealand, Courtenay and Cahan (2004) confirmed that fixed asset revaluation increments were positively associated with returns.

The research is motivated by the overseas findings that provide evidence that asset revaluation is associated with a firm’s future operating performance. Whether asset revaluation is associated with a firm’s future operating performance in New Zealand is the main concern of this research.

1.2 Background

In New Zealand, entities are permitted to revalue many of their non-current assets, either upwards or downwards, to reflect their current value (Deegan and Samkin, 2006, p.204). Three current standards relating to asset revaluations are NZ IAS 16 ‘Property, Plant and Equipment’, NZ IAS 36 ‘Impairment Assets’ and NZ IAS 38 ‘Intangible Assets’. According

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3 This research is a replication study by using New Zealand data, based on previous study conducted by Aboody, D., Barth, M.E. and Kasznik, R. (1999). Revaluations of fixed assets and future performance: evidence from the UK. *Journal of Accounting and Economics*, 26(1-3), 149-178.
to NZ IAS 16, an item of property, plant and equipment may be revalued to the extent that a ‘fair value’ can be determined. Once it has been decided to revalue a class of non-current assets, the valuations must be kept up to date. NZ IAS 16 requires that, if the fair value basis of measurement is adopted, revaluations must be made with sufficient regularity to ensure that the carrying amount of each asset in the class does not differ materially from its fair value at the balance sheet date. NZ IAS 36 requires that a non-current asset be written down to its recoverable amount. NZ IAS 38 permits intangible assets to be revalued upwards only when there is an ‘active market’ for the asset. NZ IAS 16 does not permit offsetting of revaluation gains and losses within a class of property, plant and equipment.

1.3 Research Objective

The purpose of this research is to examine whether asset revaluations are associated with a firm’s future operating income and operating cash flows in New Zealand. To test whether asset revaluations are associated with future performance, the relationship between upward asset revaluations by New Zealand firms from the year 2002 to 2005 and the changes in operating income and cash flow from operations over the subsequent one to three years are investigated. Operating performance is defined as operating accounting income and operating cash flows. The tests control current year changes in operating performance, risk, growth and size (e.g. see Aboody et al., 1999). In addition, tests on the association between asset revaluations and stock prices and returns are conducted to evaluate the market assessment of

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4 An active market is deemed to exist when the items being traded within the market are homogeneous, willing buyers and sellers can normally be found at any time, and prices are available to the public. (Deengan, C. and Samkin, G., 2006, p.204)
revaluation. To examine the robustness of our main results, further sensitivity tests are conducted.

In the test for market assessment of asset revaluation (Chapter 7.2) the data from 88 New Zealand firms over the period 2002-2005 are examined, and the relationship is estimated between share price and the revaluation balance, net income and book value of equity, where the revaluation balance is the difference between revalued fixed assets measured at the recognised revalued amount and at historical cost.

1.4 Outline of the thesis

The remainder of this thesis is organised as follows: Chapter Two discusses the theoretical framework of the asset revaluation, Chapter Three presents a literature review of asset revaluation, followed by the institutional background in Chapter Four. Chapter Five comprises the research design and method, followed by Chapter Six with descriptive statistics and results. In Chapter Seven there is a discussion of the results and Chapter Eight provides a summary and conclusion.
Chapter 2: Theoretical Framework

2.1 Introduction

This chapter discusses the theoretical association between asset revaluation and a firm’s operating performance. The areas include asset and operating performance, fair value and historical cost, the reason for applying asset revaluation, asset revaluation and its reflection on the firm’s operating performance.

2.2 Asset and operating performance

Assets generate wealth. Atkinson (2002) states that wealth is a function of assets as wealth is limited by the assets possessed. A firm’s performance is measured by its asset generated income with the expenses extracted. Therefore a firm’s performance depends on how it uses its assets to generate wealth. How can assets generate wealth? Some firms use their patent assets to generate licensing revenues, thereby improving their overall operating performance. For example, IBM is the most notable example of a firm which has increased its licensing revenues from $300 million in 1990 to $1.25 billion in 1999 (Seitter, 2005).

2.3 Fair Value vs. Historical cost
The recognition of current asset values has long been a contentious issue for accounting standard setters and capital market regulators. Some argue that it is value relevant to revalue assets to their fair value instead of recording them at historical cost, because asset revaluation provides investors with relevant information that is not readily available from other sources. Opponents argue that this does not provide reliable information, because it is difficult to verify (Seitter, 2005). The trade-off between the value relevance and reliability is crucial for managers to decide whether assets should be revalued in the financial statements.

Under today's unpredictable market conditions, investors need to know what an asset is currently worth, rather than what is was worth when it was acquired. Under New Zealand Generally Accepted Accounting Principles (GAAP), the fair value of an asset is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm’s length transaction.

The valuation approach that the IASB\(^5\) has embraced is rapidly introducing ‘fair value’ as the primary basis of asset and liability measurement. Asset revaluation can be a signaling device to measure the fair value of asset and it has been adopted by many countries (Gaeremuynck and Veugelers, 1999).

### 2.4 The reason for applying asset revaluation

\(^5\) IASB: International Accounting Standard Board.
Given situations where the current value of assets is higher than the book value in the financial statements, why do some firms apply asset revaluation but others do not? We expect that the major factor will be the extent to which management is certain that the upward asset revaluation (increment) reflects an increase in the true economic value of the asset. In other words, where managers are “reasonably certain” that the value increase will be realised in future cash flows they are more likely than not to apply upward asset revaluation (Cotter and Zimmer, 1999).

There are some other reasons for a firm to perform an asset revaluation. A firm can use upward revaluation to conserve adequate funds in the business. If an asset value is based on historical cost, the depreciation will be lower than it is at fair value, and it will show inflated profits and lead to payment of excessive dividends to shareholders. In another way, when a firm intends to take a loan from a bank or financial institution by mortgaging its fixed assets, an upward asset revaluation would enable the firm to get a higher amount of loan money. These funds, both conserved and mortgaged from the bank, could facilitate the firm’s cash flow and further re-investment, therefore, potentially increase the opportunity for the firm to achieve better operating performance. From the outsider’s point of view, asset revaluations may also provide a true picture of a firm, and therefore may attract further investments.

2.5 Asset revaluations and changes in operating performance

Do the asset revaluations reflect changes in a firm’s future performance, where performance is measured as operating income and cash flow from operations? There are two potential explanations for the association of asset revaluations and future performance.
Aboody et al., (1999) argued that investors might increase their assessments of firm value when high debt-to-equity ratio firms upwardly revalued assets because doing so reduces the probability of debt default, even if the revaluations do not reflect changes in asset values (p.155). Although managers can exercise their discretion in such an estimation opportunistically, thereby reducing the estimate’s reliability, managers also can use their discretion to reflect their private information. If asset revaluations reflect asset values and are timely, a positive association between revaluations and future changes in the firm’s performance is expected. They concluded that revaluations reflected changes in the underlying values of assets somewhat on a timely basis, and that the fair values were reliably estimable (Aboody et al., 1999).

Because future profitability of a firm depends on its value generating assets, the revalued amounts would provide the basis for predicting the future performance of a firm if these amounts reflect fair value (Jaggi and Tsui, 2001). Asset fair value represents the present value of expected future cash flows, if fair values are reliable measures of asset values, the changes in fair values should be reflected in changes in future performance.

An alternative explanation is that asset revaluation provides investors with desired information that is useful for predicting future dividends, because the revalued amount will be relevant to investors, as a basis for predicting future distributable operating flows, a determinant of future dividend potential.
The choice of whether to apply upward revaluation represents a tool available to managers to communicate their knowledge about the reliability of the revalued amount to the outside stakeholders. The decision to revalue assets is informative in terms of the relevance and reliability of the underlying value change. In asset revaluation, revaluations are measured by fair value and recognized in financial statements.

2.6 Study Rationale

Previous overseas research on asset revaluations provides evidence that asset revaluation can be an efficient mechanism to reduce the information asymmetry between a firm’s management and its shareholders. However, New Zealand firms tend to have concentrated ownership. Porta et al (1999, p.492) calculated that 100 percent of the largest companies are widely held in the United Kingdom, 90 percent in Japan, 80 percent in the United States, 65 percent in Australia and 60 percent in Canada. By contrast, in New Zealand, just 30 percent of the largest firms are widely held. Owing to the persistence of concentrated ownership in New Zealand, information asymmetry may not be as much of a problem as overseas, as shareholders may access a firm’s necessary information easily through private communication. Therefore, New Zealand managers may not necessarily choose asset revaluation as a signaling device to reduce the information asymmetry. Investors may not regard asset revaluation as necessary for their investment decisions in New Zealand. Conversely, investors may discount revaluations made by high-debt firms because managers in these firms have incentives to inflate their total assets in order to relax certain accounting-based ratios that are commonly included in lending agreements.

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6 “Widely held” was defined to mean no single shareholder has more than 20 percent of voting rights. P.492
Chapter 3: Literature Review of asset revaluation

3.1 Previous literature on asset revaluation

Many prior studies have been made of the factors associated with asset revaluation and the impact of asset revaluation. e.g. Brown, Izan and Loh (1992), Whittred and Chan (1992), Easton et al., (1993) and Cotter and Zimmer (1995) focused on motivations associated with asset revaluations, whereas Easton et al., (1993), Barth and Clinch (1998), Aboody et al., (1999), Jaggi and Tsui (2001), and Courtenay and Cahan (2004) investigated the impact of revaluations (e.g., operating income, cash flow from operations, share prices and returns).

3.1.1 Literature on motivations associated with asset revaluation

Prior studies (e.g. in Australia, UK and Hong Kong) have offered a number of reasons for firms to revalue their assets. Upward revaluations help avoid violations of debt covenants (Whittred and Chan, 1992; Brown, et al., 1992), and improve the firm’s borrowing capacity by reporting a lower leverage ratio (Brown et al., 1992; Cotter and Zimmer, 1995; Lin and Peasnell, 2000; Jaggi and Tsui, 2001). It appears that it would be more costly for a firm to pursue outside financing than implement upward asset revaluation (Whittred and Chan, 1992; Brown et al., 1992).\(^7\)

\(^7\) Especially for those firms composed mainly of assets-in-place. (Brown et al, 1992)
Large firms tend to have greater incentives to apply asset revaluations than small ones. Zimmerman (1983) found that large firms tend to be more visible, especially in terms of available wealth and larger firms have greater incentives than small ones to adopt accounting methods that give a conservative picture of profitability because their reported results are more likely to attract the critical attention of the press and government. Revaluation is an effective way of reducing this exposure, by lowering the firm’s return on capital employed. Watts and Zimmerman (1986) supported the view that political cost intensity is often related to firm size. Larger firms, being under more public scrutiny, will be more likely to revalue their assets in order to report lower rates of return. Since larger firms receive greater attention than smaller firms, it is more likely that larger firms will revalue their assets in order to report lower rates of return. Therefore, the firm size may be one of the factors which influence a company’s decision to revalue its assets.

Whittred and Chan (1992) examined the revaluation practices of Australian companies during the period of 1980-1984 and their results, based on a sample of firms that either revalued fixed assets (129 firms) or did not (299 firms), indicating that revaluers had higher growth opportunities, faced borrowing constraints, and had relatively low cash reserves. Asset revaluation increases the carrying amount of the assets and lowers the debt/equity ratio. Their findings suggest that firms are more likely to revalue their assets when their level of leverage is increasing and their borrowing capacity is reduced.

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8 Leverage: In their study, they defined that leverage equals the book value of total liability divided by the sum of the book value of tangible assets.
It has been found that revaluations are associated with the existence of debt contracts, high leverage, the reduction of political costs, simultaneous issues of bonus shares and avoidance of hostile takeover bids (Brown et al., 1992). Two possible explanations for revaluing assets are explained in their study. It is firstly hypothesized that firms with higher levels of debt have opportunistic motives to revalue their assets upward to loosen debt constraints. Thus they could avoid penalties or renegotiation costs if they violated their debt covenant. Therefore, it is a positive response because it allows the firm to benefit by avoiding these costs at the expense of the stakeholders. Second, they found that revaluations allow managers to access reserve borrowing capacity and increase financial slack, by upward revaluing total assets to reduce information asymmetry and signal that the firm’s assets are undervalued. Their findings agreed with those of Zimmerman (1983) and Watts and Zimmerman (1986), that larger firms have greater incentives to adopt income-reducing procedures and to cut the expected loss from regulations. Finally, it suggests that different firms may have different motives to revalue fixed assets. For example, the incentives driving high-debt firms to revalue may differ from the incentives driving low-debt firms.

Both the information asymmetry hypothesis of Brown et al, (1992) and Whittred and Chan’s (1992) efficient contracting explanation focused on borrowing capacity and expected revaluations to be related to the level of cash and growth options. Chapter 2, Section 4 combines these two explanations to explain why firms revalue their assets. Firstly, firms may revalue assets to increase borrowing capacity. Secondly, firms may revalue their assets to loosen debt constraints.

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9 The size of a firm is measured by its total assets in this paper.
Easton et al., (1993) reported survey evidence that the primary reason for Australian managers to revalue assets was to present true and fair financial statements (45%). Their survey also indicated that the second most common motivation was to improve debt-to-equity ratio (40%). Other reasons given were takeover (6%), takeover defence (3%), political costs (3%) and stock dividend (2%).

Cotter and Zimmer (1995) proposed that asset revaluations occur to signal available borrowing capacity via an increase in collateral values at the time of increases in secured debts, and concluded that an asset revaluation can have the effect of increasing borrowing capacity, not only by reducing reported leverage, but also by recognizing, in the accounts, increases in the value of assets that can be offered as collateral in support of further debt.

Lin and Peasnell (2000) found that revaluation would only be worthwhile if the firm had a sufficiently large stock of fixed assets to be able to generate materially different numbers. Evidence provided by Lin and Peasnell (2000) supported Zimmerman’s (1983) previous findings that larger firms’ managers may be inclined to apply upward revaluations to reduce the return on equity and on assets, thereby reducing their possible political costs.

To summarize the previous findings on the factors associated with the asset revaluation, we have found the possible incentives for asset revaluation are: (a) to provide more meaningful data on the balance sheet; (b) to improve debt to equity ratio; (c) to enhance borrowing
capacity (d) to defend against possible hostile takeover and (e) to reduce possible political cost.

3.1.2 Literature on the impact of asset revaluation

Section 3.1.1 reviewed the motivation of asset revaluation and this section focuses on the previous research on the impact of asset revaluation.

There are three relevant researches in Australia. Easton, et al., (1993) investigated the value relevance of Australian asset revaluation for 72 industrial firms from 1981 to 1990 and found the aggregate revaluation reserve increments had significant explanatory power for price-to-book ratios. They also examined whether the market value of Australian firms was aligned with their book value including revaluation. Their results indicate that the asset revaluation reserve is a significant explanatory variable for market price and returns, suggesting that Australian revaluations are value relevant, but not always timely.

Using the data set of Whittred and Chan (1992), Cotter and Zimmer (1995) on the other hand, found that companies, which revalued their fixed assets were those that experienced declining cash flows from operations as well as an increase in secured debts. Their results imply that firms that have undertaken an asset revaluation are more likely to be experiencing declining cash flows from operations than firms that have not revalued, suggesting that asset revaluations are negatively related to cash flow from operations.
Barth and Clinch (1998) extended the study by Easton et al., (1993) and examined whether relevance, reliability and timing of revaluations differed across different types of assets. They provided a detailed breakdown of their sample based on both the type of revaluation (e.g., investments; plant, property and equipment; intangibles) and industry (e.g., mining, financial, non-financial). They found that revaluations of investments and intangibles were positively associated with share prices, while the results for revaluations of property, plant, and equipment were less consistent. They concluded that revalued financial, tangible and intangible assets were value relevant.

By investigating UK firms, Aboody et al., (1999) found a significant positive relationship between asset revaluations and future changes in operating income, but the relationship between revaluations and future changes in cash flow from operations was insignificant on the two-year ahead. In addition, they found that fixed asset revaluation increments and the revaluation reserve balances were positively related to annual returns and share prices respectively, suggesting that investor’s assessments of revaluations by these firms reflect the revaluations’ relationship with future operating income.

In Hong Kong, Jaggi and Tsui (2001) extended the research of Aboody et al., (1999) and found that upward asset revaluations by Hong Kong firms were significantly positively associated with the firm’s future operating performance. In spite of differences between the Hong Kong and the U.K. markets, it is noted that the findings of the Jaggi and Tsui (2001) study and the Aboody et al., (1999) study were quite similar.
Using a similar approach to Barth and Clinch (1998), Courtenay and Cahan (2004) provided evidence that fixed asset revaluation increments were positively associated with returns in New Zealand. However, upward revaluations of intangible assets were significantly negatively related to returns\(^\text{10}\) (p.232). In addition, they found that the level of debt had a negative impact on this relationship, which suggests that capital market participants react to fixed asset revaluations differently depending on the motivation underlying the revaluation.

Courtenay and Cahan’s (2004) study confirmed that fixed asset revaluations were positively associated with returns and upward revaluations of intangible assets were negatively associated with returns. However, the study does not provide evidence on the association between asset revaluation and a firm’s operating income and cash flow from operations. The contribution of this study is to examine the association of upward asset revaluation and future operating performance.

3.2 A summary of the literature review

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<table>
<thead>
<tr>
<th>Year</th>
<th>Author(s)</th>
<th>Country</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>Zimmerman</td>
<td>Australia</td>
<td>Large firms tend to be more visible than small ones. Large firms have greater incentive to adopt asset revaluation than small ones.</td>
</tr>
<tr>
<td>1992</td>
<td>Whittred and Chan</td>
<td>Australia</td>
<td>Revaluers had higher growth opportunities, faced borrowing constraints and relatively low cash reserves.</td>
</tr>
<tr>
<td>1992</td>
<td>Brown, Izan and Loh</td>
<td>Australia</td>
<td>Revaluers were more highly levered, closer to violating debt constraints..... Managers undertake a revaluation to lower a firm's return costs and increase the value of the firm.</td>
</tr>
<tr>
<td>1995</td>
<td>Cotter and Zimmer</td>
<td>Australia</td>
<td>Asset revaluations have the effect of increasing borrowing capacity; firms that have undertaken an asset revaluation are more likely to be experiencing declining cash flows from operations than firms that have not revalued.</td>
</tr>
<tr>
<td>1998</td>
<td>Barth and Clinch</td>
<td>Australia</td>
<td>do not find that revaluations of plant, property and equipment are value relevant in their tests using returns.</td>
</tr>
<tr>
<td>1998</td>
<td>Aboody, Barth and Kasznik</td>
<td>U.K.</td>
<td>There is a significant positive association between asset revaluations by U.K. firms and a firm's future operating performance.</td>
</tr>
<tr>
<td>2000</td>
<td>Lin and Peasnell</td>
<td>Australia</td>
<td>Revaluation would only be worthwhile if the firm has a sufficiently large stock of fixed assets to be able to generate materially different numbers.</td>
</tr>
<tr>
<td>2001</td>
<td>Jaggi and Tsui</td>
<td>Hong Kong</td>
<td>Upward asset revaluation by Hong Kong firms are significantly positively associated with the firm's future operating performance.</td>
</tr>
<tr>
<td>2004</td>
<td>Courtenay and Cahan</td>
<td>New Zealand</td>
<td>Revaluation increments for fixed assets are value-relevant and upward revaluations of intangibles are associated with lower returns.</td>
</tr>
</tbody>
</table>

### 3.3 Conclusion

This chapter reviewed the empirical findings about asset revaluation motives and consequences. The next chapter will detail the institutional background to asset revaluation in the U.S., Canada, Australia, the U.K and New Zealand.
Chapter 4: Institutional Background

4.1 Introduction

The upward revaluation of non-current assets is permitted in many countries, such as the UK, Australia, Belgium, Switzerland, Spain, France, Hong Kong, Italy, Japan, the Netherlands and New Zealand. However, upward revaluation is strictly forbidden in Canada and the United States. In New Zealand, an entity can, but is not required to, revalue classes of noncurrent assets (e.g., NZ IAS 16). There are similar standards in Australia (e.g., AASB116) and in the UK (e.g., FRS 11 and FRS 15). When a firm revalues assets upward, the increment is taken directly to equity through a revaluation reserve account, whereas if the revaluation is downward, the decrement is taken to the income statement (Courtenay, S and Cahan, F., 2004) In this study, we focus only on upward revaluation because these are discretionary. G4+1 countries’ asset revaluation regulations, along with International Accounting Standards (IAS) are provided as below.

4.2 IAS

Two IAS relevant to asset revaluation are IAS 16 Property, Plant and Equipment and IAS 38 Intangible Assets.

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11 Generally accepted accounting principles require the write-down of assets to their estimated recoverable value, thus write-downs are mandatory and not discretionary.
12 “G4+1”, includes the US, the U.K., Canada, Australia and New Zealand
IAS 16 provides a benchmark treatment of cost and an allowed alternative of fair value. It requires extensive disclosure to be made in relation to the property, plant and equipment held by an entity, and the movements in those assets. However, IAS 16 does not specify how often revaluations must take place, but states that revaluation shall be made with “sufficient regularity”. Paragraph 36 of IAS 16 notes that the revaluation model is not applied to individual items of property, plant and equipment; instead, accounting policy is applied to a class of assets. Hence, for each class of assets, management must choose whether to apply the cost model or the revaluation model.

Paragraph 31 of IAS 16 states:

After recognition as an asset, an item of property, plant and equipment whose fair value can be measured reliably shall be carried at a revalued amount, being its fair value at the date of the revaluation less any subsequent accumulated depreciation and subsequent accumulated impairment losses. Revaluation shall be made with sufficient regularity to ensure that the carrying amount does not differ materially from that which would be determined using fair value at the balance sheet date.

IAS 38 Intangible Assets requires that the fair value must be determined by reference to an active market. An active market is defined as a market where items traded are homogeneous, where willing buyers and sellers can normally be found at any time, and where prices are available to the public (paragraph 8, IAS38).

In the absence of an active market, the intangible asset would be kept at the fair value determined at the date of business combination and accounted for by the cost basis (paragraph 75, IAS 38). For example, intangibles such as brands, newspaper mastheads, patents and
trademarks cannot be measured at fair value, as there is no active market for these assets because they are unique. As for the recognition of these types of intangible assets, the IASB has stated specifically that they can be measured only at cost (Paragraph 78, IAS 38).

4.3 The US

In the United States, APB\textsuperscript{13} Opinion No.6 (1965) states that: ‘Property, plant and equipment should not be written up by an entity to reflect appraisal, market or current values which are above cost to the entity’. It is accepted that the write-up of assets is an accounting principle that does not have ‘substantial authoritative support’. Financial statements that include revaluations are regarded as misleading or inaccurate.\textsuperscript{14} During 2001, The Financial Accounting Standards Board (FASB) issued Statement No.142 ‘Goodwill and Other Intangible Assets’ and No.144, ‘Accounting for the Impairment or Disposal of Long-Lived Assets’. FASB Statement No. 144 does not allow upward revaluation of fixed assets to reflect fair market values although it is compulsory to account for impairment in fixed assets (downward revaluation of fixed assets).

4.4 Canada

\textsuperscript{13} APB: Accounting Principles Board, APB Opinion, No.6, Status of Accounting Research Bulletin, AICPA, New York, 1965
\textsuperscript{14} Henderson, S. and Goodwin, J. (1992) Abacus p76, ‘it is acknowledged that SEC has recently supported a move away from historical cost by advocating that certain investment securities can be “marked to market” in financial statements. At this stage, the recommendation relates only to monetary assets held by financial institutions and there is no evidence that the SEC is supporting a more general move away from historical cost for non-monetary assets. (Wyatt, 1991) This was originally quoted by Henderson, S. and Goodwin, J. (1992)’

The case against asset revaluations”, Abacus, Vol.28 No. 1, 1992 pp75
In Canada, Section 3060 Capital Asset, of the CICA Handbook (1990), Para. 18 states that: “a capital asset should be recorded at cost”. The accounting practices regard asset revaluation as not reliable. “Historical cost, on the other hand, arguably is more objective and at the date of acquisition of the asset may be regarded as a reasonable or minimal approximation of value” (Henderson & Goodwin, 1992, p.79).

Section 3061, Property, Plant and Equipment: The significant change introduced in this section is the terminology used to describe what was previously known as “Capital Assets”. Given the introduction of Section 3062—Goodwill and Other Intangible Assets, the term “Capital Assets” includes goodwill and intangibles. As a result, depreciable tangible assets will have to be described as “Property, Plant and Equipment”, “Plant and Equipment” or some other descriptive name.

Goodwill and Other Intangible Assets - Handbook Section 3062, states that goodwill and intangible assets are no longer permitted to be amortized. Instead, the value of these assets has to be tested for impairment on a regular basis (at least annually), unless the entity qualifies for Differential Reporting. Also, “goodwill” and “other intangible assets” require separate line item disclosure. They should not be grouped as “Goodwill and Other Intangibles” as has commonly been done in the past.

4.5 The UK
In the UK, the Companies Act of 1985 sets forth UK GAAP for asset revaluations. Alternative Accounting Rules, Part C, Schedule 4, UK GAAP permits upward revaluations of long-lived assets, including many types of intangible assets, but not goodwill, when the asset’s carrying amount exceeds its net realizable value. UK Statement of Standard Accounting Practice No. 12 encourages revaluations of tangible fixed assets on the ground that they provide “useful and relevant information to users of accounts” (Aboody et al., 1999, p. 152-153). Managers can increase or decrease the carrying value of assets when asset values change. The difference between an asset’s carrying amount and revalued amount is credited to a separate equity revaluation reserve account if the revaluation results in an increase in the asset’s carrying amount. Transfers are permitted from the revaluation reserve to the profit and loss reserve for depreciation expenses associated with revaluations.

FRS 11: Impairment of fixed assets and goodwill, states that total recognised gains and losses should be read to mean the revaluation reserve. Where impairment losses are taken to be one of the reserves, it should only be to the extent that the carrying value becomes equal to the depreciated historical cost. Downward revaluations in excess of the credit in the revaluation or other reserve, or leading to a reduction in value below the depreciated historical cost should be charged to the operating cost statement, unless it can be demonstrated that the recoverable amount is greater than the revalued amount, in which case the impairment can be taken to the statement of recognised gains and losses.

FRS 15 Tangible Fixed Asset, states that gains in the revaluation of fixed assets should be credited to the relevant reserve. This will be the donated asset reserve in respect of donated assets, or to a government grant reserve in respect of assets financed by government grant.
Loss on revaluation should be debited to the relevant reserve to the extent that gains have been recorded previously and otherwise to the operating cost statement, unless it can be demonstrated that the impairment can be taken to the statement of recognised gains and losses.

**4.6 Australia**

Australian GAAP permit firms to revalue non-current assets upward when the asset’s recoverable amount exceeds its carrying amount and requires firms to revalue non-current assets downward when the asset’s recoverable amount fails below its carrying amount.

Two new standards relevant to asset revaluation are AASB 116, “Property, Plant and Equipment” and AASB 138, “Intangible Assets”. Both standards were introduced in 2005 and are equivalent to IAS 16 “Property, Plant and Equipment”, and IAS 38 “Intangible Assets” issued by the IASB. For-profit entities that comply with requirements of AASB 116 and AASB 138 will simultaneously be in compliance with the requirements of IAS 16 and IAS 38. However, not-for-profit entities using the added “Aus” paragraphs in the standards that specifically apply to not-for-profit entities may not be simultaneously complying with IAS standards.

_AASB 116, “Property, Plant and Equipment”, is equivalent to IAS 16 Property, Plant and Equipment, issued by the IASB. The standard defines that if an item of property, plant and_
equipment is revalued, the entire class of property, plant and equipment to which that asset belongs shall be revalued (Paragraph 36, AASB 116).

The standard requires that if an asset’s carrying amount is increased as a result of a revaluation, the increase shall be credited directly to equity under the heading of revaluation reserve. However, the increase shall be recognised in profit and loss to the extent that it reverses a revaluation decrease of the same asset previously recognised in profit or loss (AASB 116, Paragraph 39).

AASB 138, Intangible Assets, states that, for the purpose of revaluations, fair value shall be determined by reference to an active market. Revaluation shall be made with such regularity that at the reporting date the carrying amount of the asset does not differ materially from its fair value (Para, 75, AASB 138). However, the revaluation model does not allow the revaluation of intangible assets that have not previously been recognised as assets; or the initial recognition of intangible asset at amounts other than cost. Paragraph 81 states that if an intangible asset in a class of revalued intangible assets cannot be revalued because there is no active market for this asset, the asset shall be carried at its cost less any accumulated amortisation and impairment losses.

4.7 New Zealand

In New Zealand, FRS-3 was approved on March 2001 by the Accounting Standards Review Board under the Financial Reporting Act 1993 and has recently been replaced by
relevant International standards (NZ IAS 16, NZ IAS 36 and NZ IAS 38). This thesis’ data was extracted from financial statements that have been prepared under FRS-3 Accounting for Property, Plant and Equipment. Therefore, it becomes necessary to describe some of the content of FRS-3, which is relevant to this thesis. This section mainly focuses on the FRS-3 and followed by a comparison of FRS-3 and the current NZ IAS standards.

FRS-3 deals with accounting for items of property, plant and equipment under the historical cost and modified historical cost systems of accounting; and accounting for the consumption or loss of economic benefits embodied in items of property, plant and equipment. However this standard does not deal with investment properties and properties intended for sale (Section 2.3 c). An item of property, plant and equipment must be initially recognised at historical cost, which includes cost directly attributable to bringing the item to working condition for its intended use, but subsequent to initial recognition, an item or property, plant and equipment may be revalued to a fair value. FRS-3 defines that ‘fair value’ is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm’s length transaction (section 4.23). While the annual revaluation of items of property, plant and equipment is not required by the standard, the adoption of a system involving annual revaluation, especially of land and building, is encouraged in order to provide more relevant information to users of an entity’s financial report.

Revaluation Increments & Decrements: FRS-3 requires revaluation increments and decrements within a class of property, plant and equipment to be offset, with only the net revaluation increment or decrement for the class to be accounted for. Section 7.11 states that
“when an item of property, plant and equipment is revalued, the related accumulated depreciation charges as at the date of revaluation must be credited to the gross carrying amount of the item. The gross carrying amount must then be increased or decreased by the amount of the revaluation increment or decrement.” The revaluation increment or decrement must be recognised in the statement of movements in equity. The standard also mentions that a change in the measurement base of a class of property, plant and equipment must be accounted for as a change in accounting policy.

*How to determine fair value:* FRS-3 commentary 4.25 states that the fair value of an asset is determined by reference to its highest and best use, that is, the most probable use of the asset that is physically possible, appropriately justified, legally permissible, financially feasible, and which results in the highest value. Where the fair value of an asset is able to be determined by reference to the price in an active market for the same asset or a similar asset, the fair value of the asset is determined using this information. Where the fair value of an asset is not able to be determined in this manner, the fair value of asset is determined using other market-based evidence, such as by a discounted cash flow calculation using market estimates of the cash flows able to be generated by the asset and a market-based discount rate.

The latest standards relevant to asset revaluations in New Zealand are NZ IAS 16 ‘Property, Plant and Equipment’, NZ IAS 36 ‘Impairment Assets’ and NZ IAS 38 ‘Intangible Assets”. These three standards are very similar to the relevant IAS standards.

NZ IAS 16 provides some guidance on the determination of fair values. It is emphasised that fair values are determined on the basis that the entity is a going concern and there is no
need or intention to liquidate the assets. If there is an active and liquid market for an asset, the market price represents evidence of the asset’s fair value. This represents the amount for which an asset could be exchanged between knowledgeable, willing parties in an arm’s length transaction. This is similar to the previous FRS-3 standard. However, IAS16 requires revaluation increments and decrements to be accounted for on the basis of individual items, whereas FRS-3 requires revaluation increment and decrement to be accounted for on the basis of class. Under NZ IAS 16, it is required that a revaluation increment be credited directly to a revaluation surplus (or revaluation reserve) account. The revaluation surplus is a part of equity.

NZ IAS 16 states that: ‘If an asset’s carrying amount is decreased as a result of a revaluation; the decrease shall be recognised in profit or loss.’ Where the revaluation decrement exceeds the existing balance of the revaluation increment to which it relates, any amount in excess of this should be recognised in the income statement.

FRS-3 and NZ IAS 16 require revaluations to be carried out with sufficient regularity to ensure that the carrying amount of an item of property, plant and equipment is not materially different from its fair value. However, FRS-3 has an additional requirement which does not allow an item of property, plant and equipment to be included at a valuation that was determined more than five year previously. FRS-3 permits an entity that has revalued a class of property, plant and equipment to stop revaluing under certain conditions. These include circumstances where materiality or cost-benefit reasons justify the change and where one-off combination.
In respect of a class of assets, reversal of previous revaluations should, as far as possible, be accounted for by entries that are the reverse of those bringing the previous revaluation to account. Where a revaluation decrement reverses a previous increment (or cumulative increment) for an individual asset, it would be debited to the revaluation surplus previously credited for that asset, rather than being debited to the income statement (Deegan & Samkin, 2006, p. 211).

4.8 A summary of the institutional background
<table>
<thead>
<tr>
<th>Country</th>
<th>Relevant Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAS</td>
<td>IAS 16, &quot;Property, Plant and Equipment&quot;</td>
</tr>
<tr>
<td></td>
<td>IAS 38, &quot;Intangible Assets&quot;</td>
</tr>
<tr>
<td>The U.S.</td>
<td>FASB Statement No. 142, &quot;Goodwill and Other Intangible Assets&quot;</td>
</tr>
<tr>
<td></td>
<td>FASB Statement No. 144, &quot;Accounting for Impairment or Disposal of Long-Lived Assets&quot;</td>
</tr>
<tr>
<td>Canada</td>
<td>CICA Handbook Section 3060, &quot;Capital Assets&quot;</td>
</tr>
<tr>
<td></td>
<td>CICA Handbook Section 3061, &quot;Property, Plant and Equipment&quot;</td>
</tr>
<tr>
<td></td>
<td>CICA Handbook Section 3062, &quot;Goodwill and Other Intangible&quot;</td>
</tr>
<tr>
<td>The U.K.</td>
<td>FRS 11, &quot;Impairment of Fixed Assets and Goodwill&quot;</td>
</tr>
<tr>
<td></td>
<td>FRS 15, &quot;Tangible Fixed Assets&quot;</td>
</tr>
<tr>
<td>Australia</td>
<td>AASB 116, &quot;Property, Plant and Equipment&quot;</td>
</tr>
<tr>
<td></td>
<td>AASB 138, &quot;Intangible Assets&quot;</td>
</tr>
<tr>
<td>New Zealand</td>
<td>FRS-3, &quot;Accounting for Property, Plant and Equipment&quot;</td>
</tr>
<tr>
<td></td>
<td>NZ IAS 16, &quot;Property, Plant and Equipment&quot;</td>
</tr>
<tr>
<td></td>
<td>NZ IAS 36, &quot;Impairment Assets&quot;</td>
</tr>
<tr>
<td></td>
<td>NZ IAS 38, &quot;Intangible Assets&quot;</td>
</tr>
</tbody>
</table>
Chapter 5: Research Design and Method

5.1 Development of Hypotheses

Aboody et al., (1999) hypothesised that upward asset revaluation provides a mechanism for signalling the manager’s private information about asset values. In support of this assertion, they found a positive association between upward asset revaluation and a firm’s future performance. They concluded that this significant association implies that these revaluations are reliably estimable. This paper investigates the changes in future operating income and operating cash flows for upward asset revaluation firms in New Zealand. The changes in a firm’s future operating performance, while not directly testing for differences in market reactions, avoid the assumption of market efficiency and allow us to assess whether upward asset revaluations convey additional information about expected future performance.

If managers’ decisions about whether to apply upward asset revaluations are a function of their certainty about the values being realised, it is more likely than not that an increase in the firm’s operating performance will be observed for applying upward revaluation. The choice of whether to apply upward revaluation represents a tool available to managers to communicate their knowledge about the reliability of the revalued amount to the outside stakeholders.

It has been argued that asset revaluation is an efficient mechanism for communicating the market value of assets to financial statement users (Aboody et al., 1999). Investors may increase their assessments of a firm’s value when high debt-to-equity ratio firms upwardly revalue assets, because doing so reduces the probability of debt default, even if the revaluations do not reflect
changes in asset values. Because future profitability of a firm depends on its value generating assets, the revalued amounts would provide the basis for predicting future performance of a firm if these amounts reflected fair value (Jaggi and Tsui, 2001). The tests focus on whether upward New Zealand asset revaluations explain future changes in a firm’s performance, measured by operating income and cash flow from operations. The following two cross-sectional equations: (1) and (2) are estimated, developed by Aboody et al., 1999.

5.1.1 Hypothesis 1: Asset revaluation is associated with a firm’s future operating income.

Aboody et al., (1999) found consistent evidence that current year asset revaluations by UK firms were significantly positively associated with future operating income, over one, two and three years subsequent to the revaluations. The association between current year revaluations and future operating income was examined, by using the operating income one, two and three years ahead. The model developed by Aboody et al., (1999) is employed to test this relationship:

$$\Delta OPINC_{t+\tau,i} = \sum_{y=2002}^{2005} \alpha_y YR_{yi} + \alpha_1 REV_{yi} + \alpha_2 \Delta OPINC_{yi} + \alpha_3 MB_{yi} + \alpha_4 ASSET_{yi} + \xi_{yi}$$

The association between the change in operating income ($\Delta OPINC_{t+\tau}$) and current year revaluation ($REV_{i}$) is tested over three horizons, change from year $t$ to year $t+\tau$, where $\tau=1, 2,$
3. The change in operating income $\Delta \text{OPINC}_{t+\tau}$ is defined as $\text{OPINC}_{t+\tau} - \text{OPINC}_t$, and this is deflated by the market value of equity for the beginning of year $t$. The operating income represents income from continuing operations before taxes, interest, and depreciation and amortization expenses, and net gains on asset revaluations. Interest and income tax expenses are excluded, because operating performance is the focus. Depreciation and amortization expenses are excluded and net gains on asset dispositions because asset revaluations affect these amounts (Aboody et al., 1999). Thus, excluding them reduces any mechanical effect of revaluations on our performance measure. $\text{REV}_i$ is asset revaluation in year $t$ by the firm $i$.

If revaluation reflects changes in the values of assets associated with operations, then revaluation will be positively associated with future changes in performance. Therefore, it is predicted that $\alpha_1$ will be positive. However, there are several other factors which influence the change in operating income. These other factors are controlled by the following variables:

1. Change in income – $\Delta \text{OPINC}_i$
2. Market to book value of equity - $\text{MB}_i$; and
3. Logarithm of asset at the end of year $t$ - $\text{ASSET}_i$, which controls for potential effects of size.

The change in income from year $t-1$ to year $t$, $\Delta \text{OPINC}_t$, deflated by the market value of equity for the beginning of period $t$, controls for the time-series properties of earnings that can affect the future operating income. The market to book equity $\text{MB}_i$ based on the book value of equity excluding the revaluation balance, controls for the potential risk and growth effects.
on future operating income. The logarithm of total assets-ASSET\_t, excluding revaluation balance, controls for size effect. In order to control for effect omitted macro-economic variables during the test period, the regression intercept varies across years. YR\_y in the equation is an indicator variable for the intercept, which equals one if it is an observation from year \( y \), and otherwise zero. (Aboody et al., 1999)

5.1.2 **Hypothesis 2: Asset revaluation is associated with a firm's future operating cash flows.**

Aboody et al., (1999) argued that there is a positive association between asset revaluation and the firm’s operating cash flows. The following model is used to test the association between asset revaluation and future operating cash flows (e.g., see Aboody et al., 1999)

\[
\Delta \text{CFO}_t + YR_{t-1} = \sum_{y=2002}^{2005} \beta_y YR_{t-1} + \beta_1 \text{REV}_t + \beta_2 \Delta \text{CFO}_t + \beta_3 \Delta WC_t + \beta_4 MB_t + \beta_5 \text{ASSET}_t + \delta_t
\]

(2)

\( \Delta \text{CFO} \) represents the changes in cash flow from operations. The cash flow from operations measured used in this study is calculated using the accounting numbers contained in published financial statements.

\( \Delta WC_t \), the changes in working capital\(^{15} \) from year \( t-1 \) to year \( t \). Both \( \Delta \text{CFO}_t \) and \( \Delta WC_t \) are deflated by the market value of equity at the start of year \( t \), because different firm sizes lead to

\(^{15} \) Working capital is defined as “Current Assets minus Current Liabilities” in this paper.
different scales in cash flow from operations. To deflate them by the market value of equity makes the data comparable among firms. All other variables are as defined in Equation (1).

5.2 Sample selection

All industrial and commercial firms (excluding financial and government institutions) listed on the New Zealand Stock Exchange (NZSX) in the first year (2002) were chosen; including firms that applied asset revaluations and those that did not. Data was obtained from the Investment Research Group (IRG) database and the Lincoln University Library, covering periods from 2001 to 2005. The year 2002 was selected as the starting year for the study because the number of asset revaluations before 2001 was very small. Sampling was subject to the constraints that data were available on the IRG database. Firms with missing data or values for revaluations were removed from the sample. As a result of this screening process, 92 observations were removed. The final sample comprised eighty-eight firms that encompassed nineteen revaluing firms and sixty-nine non-revaluing firms.

The revaluation reserve account balance of New Zealand firms, however, does not show the current revaluation amounts \( \text{REV}_t \). We therefore calculated the amounts \( \text{REV}_t \) from revaluation reserve balances. The year-end balances could be affected by upward or downward revaluations and/or by adjustments resulting from disposal of revaluated assets during the year. The end balances of revaluation reserve accounts in the database would have

\[ \text{REV}_t \]

16 22 of those were financial and government institutions and 70 of them were without complete data, either on the review year or the subsequent three years.
been affected by additions as a result of upward revaluations during the year, or by subtractions as a result of disposal of revaluated assets during the year.

The upward revaluation amount for the year $t$ (REV $t$) is calculated by subtracting the year $(t-1)$ balance from the year $(t)$ balance of the revaluation reserve account. If the difference is positive, it is considered an upward revaluation for year $t$; if the difference is negative, it is classified as a downward revaluation. If the difference is zero, it is considered as a non-revaluation for period $t$. Firms with a zero balance in the revaluation account (excluding missing values) are also considered as non-revaluation observations. It is, however, possible that an upward asset revaluation may have been applied and offset against an adjustment due to the disposal of revalued assets. This would result either in underestimation of REV observations and overestimation of non-revaluation observations for the current year or it could reduce the amount for upward revaluation observations. To avoid this happening, the notes to the financial statements were reviewed, to verify the amount and any adjustments made to the revaluation reserve accounts.

The number of observations in both groups (revaluers and non-revaluers) is provided in Table 5-1 and statistics data on firms which applied upward asset revaluation in the year 2002 is in Table 5-2.
### Table 5-1: Calendar Year 2002 Characteristics of Sample

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>% in Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Firms with complete data on year 2002 and subsequent three years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Non-Revaluers</td>
<td>69</td>
<td>43.67</td>
</tr>
<tr>
<td>-Revaluers</td>
<td>19</td>
<td>12.03</td>
</tr>
<tr>
<td>- Upwards</td>
<td>10</td>
<td>6.33</td>
</tr>
<tr>
<td>- Downwards</td>
<td>9</td>
<td>5.70</td>
</tr>
<tr>
<td><strong>Firm without complete data on year 2002 or subsequent three years</strong></td>
<td>70</td>
<td>44.30</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>158</td>
<td>100</td>
</tr>
</tbody>
</table>

*There are 22 financial firms listed on NZSE on the year 2002, which are not included in this observation*

*Firms without complete data on year 2002 & subsequent years 2003, 2004 and 2005 are not included in this observation.*
### Table 5-2: Statistics on firms which applied asset revaluation on year 2002

<table>
<thead>
<tr>
<th>Firm Name</th>
<th>REV Amount (000)</th>
<th>OPINC/ CFO 2002 (000)</th>
<th>OPINC/ CFO 2003 (000)</th>
<th>OPINC/ CFO 2004 (000)</th>
<th>OPINC/ CFO 2005 (000)</th>
<th>MV2002 (000)</th>
<th>MV2003 (000)</th>
<th>MV2004 (000)</th>
<th>MV2005 (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFFCO HOLDINGS LTD</td>
<td>567</td>
<td>6,766</td>
<td>10,957</td>
<td>153,064</td>
<td>169,143</td>
<td>10,957</td>
<td>21,800</td>
<td>8,353</td>
<td>1,449</td>
</tr>
<tr>
<td>AUCKLAND INTERNATIONAL AIRPORT</td>
<td>169,143</td>
<td>32,755</td>
<td>218,940</td>
<td>203,950</td>
<td>131,036</td>
<td>221,518</td>
<td>203,950</td>
<td>221,518</td>
<td>221,518</td>
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<tr>
<td>THE COLONIAL MOTOR CO LTD</td>
<td>175</td>
<td>17,474</td>
<td>8,653</td>
<td>13,302</td>
<td>5,456</td>
<td>8,653</td>
<td>21,800</td>
<td>11,124</td>
<td>1,449</td>
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<tr>
<td>CADMUS TECHNOLOGY LTD</td>
<td>1,158</td>
<td>17,336</td>
<td>18,281</td>
<td>13,171</td>
<td>13,242</td>
<td>18,113</td>
<td>19,325</td>
<td>77,983</td>
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<tr>
<td>HALLENSTEIN GLASSON HOLDINGS LTD</td>
<td>95,580</td>
<td>72,027</td>
<td>80,771</td>
<td>17,196</td>
<td>41,547</td>
<td>80,771</td>
<td>19,172</td>
<td>192,174</td>
<td>231,174</td>
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<tr>
<td>INFRATIL LTD</td>
<td>59,473</td>
<td>39,593</td>
<td>50,781</td>
<td>47,859</td>
<td>54,081</td>
<td>60,781</td>
<td>41,547</td>
<td>192,174</td>
<td>242,101</td>
</tr>
<tr>
<td>MILLIENIUM &amp; COPTHORNE HOTELS NZ LTD</td>
<td>2,803</td>
<td>15,687</td>
<td>18,411</td>
<td>21,402</td>
<td>26,134</td>
<td>18,911</td>
<td>27,621</td>
<td>192,174</td>
<td>242,101</td>
</tr>
<tr>
<td>METLIFECARE LTD</td>
<td>14,328</td>
<td>7,309</td>
<td>27,856</td>
<td>35,750</td>
<td>38,472</td>
<td>29,856</td>
<td>35,750</td>
<td>336,294</td>
<td>336,294</td>
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<tr>
<td>RYMAN HEALTHCARE LTD</td>
<td>7,562</td>
<td>35,545</td>
<td>108,688</td>
<td>140,364</td>
<td>173,016</td>
<td>108,688</td>
<td>140,364</td>
<td>365,000</td>
<td>520,000</td>
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<tr>
<td>TRUSTPOWER LTD</td>
<td>712</td>
<td>91,118</td>
<td>90,948</td>
<td>110,005</td>
<td>171,005</td>
<td>91,118</td>
<td>90,948</td>
<td>1,228,117</td>
<td>2,143,461</td>
</tr>
</tbody>
</table>

#### Mean

<table>
<thead>
<tr>
<th></th>
<th>REV Amount (000)</th>
<th>OPINC/ CFO 2002 (000)</th>
<th>OPINC/ CFO 2003 (000)</th>
<th>OPINC/ CFO 2004 (000)</th>
<th>OPINC/ CFO 2005 (000)</th>
<th>MV2002 (000)</th>
<th>MV2003 (000)</th>
<th>MV2004 (000)</th>
<th>MV2005 (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>29,047</td>
<td>38,978</td>
<td>54,747</td>
<td>64,577</td>
<td>70,990</td>
<td>1,033,756</td>
<td>1,237,821</td>
<td>2,530,748</td>
<td>715,680</td>
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<tr>
<td>Median</td>
<td>4,130</td>
<td>19,735</td>
<td>27,681</td>
<td>39,094</td>
<td>35,867</td>
<td>182,404</td>
<td>263,031</td>
<td>293,608</td>
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<tr>
<td>Std.Dev</td>
<td>57,211</td>
<td>44,369</td>
<td>54,980</td>
<td>61,837</td>
<td>70,330</td>
<td>1,190,448</td>
<td>1,738,982</td>
<td>2,143,461</td>
<td>930,756</td>
</tr>
</tbody>
</table>
REV is the total net asset revaluation increment amount;

MV is the market value of equity;

OPINC is the operating income - income before interest, income tax and depreciation and amortization expenses, and net gains on asset dispositions.

5.3 Variable Measurement

Univariate tests were conducted to compare the dependent variables and independent variables in two groups, namely firms that revaluated their assets for publication of their annual reports and firms that did not. The dependent variables include: \( \Delta \text{OPINC} \) \( t+1 \), \( \Delta \text{OPINC} \) \( t+2 \), \( \Delta \text{OPINC} \) \( t+3 \), \( \Delta \text{CFO} \) \( t+1 \), \( \Delta \text{CFO} \) \( t+2 \), \( \Delta \text{CFO} \) \( t+3 \); and the independent variables include: REV \( t \), \( \Delta \text{OPINC} \) \( t \), MB \( t \), ASSET \( t \), \( \Delta \text{CFO} \) \( t \), AWC \( t \). These are summarised in Table 5-3.
Table 5-3: Variable Measurements

<table>
<thead>
<tr>
<th>DEPENDENT VARIABLES</th>
<th>DEFINITION AND MEASUREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta \text{OPINC}_{t+1}$</td>
<td>operating income in year $t+1$ minus operating income in year $t$</td>
</tr>
<tr>
<td>$\Delta \text{OPINC}_{t+2}$</td>
<td>operating income in year $t+2$ minus operating income in year $t+1$</td>
</tr>
<tr>
<td>$\Delta \text{OPINC}_{t+3}$</td>
<td>operating income in year $t+3$ minus operating income in year $t+2$</td>
</tr>
<tr>
<td>$\Delta \text{CFO}_{t+1}$</td>
<td>cash flow from operations in year $t+1$ minus cash flow from operations in year $t$</td>
</tr>
<tr>
<td>$\Delta \text{CFO}_{t+2}$</td>
<td>cash flow from operations in year $t+2$ minus cash flow from operations in year $t+1$</td>
</tr>
<tr>
<td>$\Delta \text{CFO}_{t+3}$</td>
<td>cash flow from operations in year $t+3$ minus cash flow from operations in year $t+2$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLES</th>
<th>DEFINITION AND MEASUREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{REV}_t$</td>
<td>net increment to the revaluation balance from revaluations to fixed assets in year $t$</td>
</tr>
<tr>
<td>$\text{MB}_t$</td>
<td>market to book equity ratio at the end of year $t$ (book value of equity excludes the revaluation balance)</td>
</tr>
<tr>
<td>$\text{ASSET}_t$</td>
<td>the log of book value total assets, excluding the revaluation balance, at the end of year $t$</td>
</tr>
<tr>
<td>$\Delta \text{WC}_t$</td>
<td>the working capital in year $t$ minus working capital in year $t-1$</td>
</tr>
<tr>
<td>$\Delta \text{OPINC}_t$</td>
<td>operating income in year $t$ minus operating income in year $t-1$</td>
</tr>
<tr>
<td>$\Delta \text{CFO}_t$</td>
<td>cash flow from operations in year $t$ minus cash flow from operations in year $t-1$</td>
</tr>
</tbody>
</table>
ASSET \ t \text{ is the total net book value of assets, excluding the revaluation balance;}

\Delta \text{OPINC} \ t+\tau \ (\Delta \text{CFO} \ t+\tau) \text{ is operating income (cash from operations) in year } t+\tau \ (\tau =1, 2, 3) \text{ minus operating income (cash flow from operations) in year } t.

\text{MB} \ t \text{ is market to book ratio at the end of fiscal year } t, \text{ where book value excludes the revaluation balance.}

\Delta \text{OPINC} \ t+\tau, \Delta \text{CFO} \ t+\tau, \text{ are deflated by the market value of equity at the beginning of year } t. \text{ because different firm sizes lead to different scales in cash flow from operations. To deflate them by market value of equity makes the data comparable among firms}
Chapter 6: Descriptive Statistics and Results

6.1 Data and Descriptive Statistics
Table 6-1: Descriptive Statistics

**Panel A: Financial Statement Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>No Current Revaluations (N=69)</th>
<th>Current Year Revaluations (N=19)</th>
<th>Current Year Upward Revaluations (N=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔOPINC t</td>
<td>-0.051 1.974</td>
<td>0.043 0.170</td>
<td>0.064 0.223</td>
</tr>
<tr>
<td>ΔOPINC t+1</td>
<td>0.141 1.157</td>
<td>0.049 0.092</td>
<td>0.041 0.067</td>
</tr>
<tr>
<td>ΔOPINC t+2</td>
<td>0.334 1.33</td>
<td>0.038 0.086</td>
<td>0.053 0.102</td>
</tr>
<tr>
<td>ΔOPINC t+3</td>
<td>-0.691 6.995</td>
<td>0.017 0.048</td>
<td>0.013 0.063</td>
</tr>
<tr>
<td>ΔCFO t</td>
<td>0.526 3.052</td>
<td>0.047 0.125</td>
<td>0.045 0.156</td>
</tr>
<tr>
<td>ΔCFO t+1</td>
<td>1.233 8.159</td>
<td>0.015 0.043</td>
<td>0.019 0.052</td>
</tr>
<tr>
<td>ΔCFO t+2</td>
<td>-0.174 1.981</td>
<td>0.009 0.043</td>
<td>0.009 0.061</td>
</tr>
<tr>
<td>ΔCFO t+3</td>
<td>0.440 3.197</td>
<td>0.007 0.029</td>
<td>0.002 0.025</td>
</tr>
<tr>
<td>MV ('000,000)</td>
<td>499.952 1421.942</td>
<td>545.906 1234.752</td>
<td>761.359 1671.524</td>
</tr>
<tr>
<td>BV ('000,000)</td>
<td>165.564 380.413</td>
<td>225.261 240.387</td>
<td>259.909 250.276</td>
</tr>
<tr>
<td>ASSETS ('000,000)</td>
<td>395.251 1161.933</td>
<td>402.958 427.026</td>
<td>440.5 364.315</td>
</tr>
<tr>
<td>WC</td>
<td>0.7422 2.4010</td>
<td>0.1154 0.1635</td>
<td>2.0584 2.1628</td>
</tr>
<tr>
<td>MB</td>
<td>3.376 4.756</td>
<td>1.803 1.756</td>
<td>2.0584 2.1628</td>
</tr>
</tbody>
</table>
MV is the market value of equity at fiscal year end; BV is the book value of equity, excluding the revaluation balance, at fiscal year end; \( \Delta \text{OPINC}_{t+\tau} \) and \( \Delta \text{CFO}_{t+\tau} \) are defined the same as previously.

Table 6-1 provides statistics on data obtained from the IRG database for different variables for the study year for current year revaluation and non-revaluation observations. Means of revaluation observation are lower compared to those non-revaluation observations on market-to-book value ratio (2.06 vs. 3.38). Furthermore, means of revaluation observations are significantly lower than those non-revaluation observations on \( \Delta \text{CFO}, \) (Revaluers-0.045 Vs Non-revaluers-0.526). The finding is consistent with Cotter and Zimmer (1995), that companies, which revalued their assets, were those that experienced declining cash flows from operations. The mean of the revaluation observation is slightly higher than those non-revaluation observations on assets. The result agrees with Brown et al., (1992) who found that the larger companies had greater frequency of revaluing their assets in Australia.

The means of changes in operating income and cash flow from operations (deflated by Market Value of Equity) between revaluers and non-revaluers are depicted as Charts 6-1 and 6-2 below.
Chart 6-1: Changes in Operating Income between Revaluers and Non-Revaluers in the year 2002 and three years ahead.

Comparison of Means between Revaluers & Non-revaluers (Changes in Operating Income)
Chart 6-2: Changes in Cash Flow from Operations between Revaluers and Non-Revaluers in the year 2002 and three-years ahead.

Comparison of Means between Revaluers & Non-revaluers (Changes in Cash flow from operations)
Charts 6-1 and 6-2 show that both means of operating income and cash flow from operations (deflated by MV) on three years ahead are higher (at least no less) than the observation year 2002 for firms applying asset revaluation. However, there are significant fluctuations (both positive and negative) for firms which did not apply asset revaluation.

6.2 Correlation Analysis

The Spearman Correlation was chosen rather than the Pearson Correlation in this paper, as the samples are not normally distributed. The Spearman Correlation coefficients are presented in Table 6-2. These results provide preliminary evidence that asset revaluation in the year 2002 is positively related to the future one-year ahead operating income (coefficient=0.10 with sig.=0.19) and one-, two- and three-year ahead cash flow from operations (coefficient=0.05, 0.02 & 0.08 and sig.=0.32, 0.41 & 0.22 respectively). The coefficients are positive but not significant.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>REV 2002/MV</td>
<td>Correlation coefficient 1.00</td>
<td>Sig. (1-tailed) .</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔOPINC 2003/MV</td>
<td>Correlation coefficient 0.10</td>
<td>1.00</td>
<td>Sig. (1-tailed) 0.19</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔOPINC 2004/MV</td>
<td>Correlation coefficient -0.06</td>
<td>-0.21</td>
<td>1.00</td>
<td>Sig. (1-tailed) 0.28</td>
<td>0.02</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>ΔOPINC 2005/MV</td>
<td>Correlation coefficient -0.01</td>
<td>0.05</td>
<td>0.07</td>
<td>1.00</td>
<td>Sig. (1-tailed) 0.46</td>
<td>0.32</td>
<td>0.26</td>
</tr>
<tr>
<td>ΔCFO 2003/MV</td>
<td>Correlation coefficient 0.05</td>
<td>0.10</td>
<td>0.34</td>
<td>0.36</td>
<td>1.00</td>
<td>Sig. (1-tailed) 0.32</td>
<td>0.17</td>
</tr>
<tr>
<td>ΔCFO 2004/MV</td>
<td>Correlation coefficient 0.02</td>
<td>0.12</td>
<td>0.26</td>
<td>0.28</td>
<td>0.64</td>
<td>1.00</td>
<td>Sig. (1-tailed) 0.41</td>
</tr>
<tr>
<td>ΔCFO 2005/MV</td>
<td>Correlation coefficient 0.08</td>
<td>0.00</td>
<td>0.23</td>
<td>0.47</td>
<td>0.50</td>
<td>0.66</td>
<td>1.00</td>
</tr>
</tbody>
</table>

* N = 83
6.3 Analysis of Variance

Before conducting the regression, the firms were classified into two groups, represented by the independent variable REV. This is a dummy variable, where REV = 1, if a firm revalued its asset in the year 2002, otherwise REV = 0 (non-revaluers). $\Delta OPINC_{t+1}$, $\Delta OPINC_{t+2}$, $\Delta OPINC_{t+3}$ are the dependent variables and the analysis of variance results of Equation (1) are as shown in Table 6-3, Panel A.

To analyse Equation (2), we conducted the same analysis of variance for cash flow from operations (CFO), we assumed that REV = 1 if a firm applied asset revaluation in the year 2002, otherwise REV = 0. $\Delta CFO_{t+1}$, $\Delta CFO_{t+2}$, $\Delta CFO_{t+3}$ are the dependent variables and the analysis of variance results of Equation (2) are as shown on Table 6-3, Panel B below.
Table 6-3: Summary regression statistics on future performance and changes in operating income and cash flow from operations as dependent variables

**Panel A: Future change in operating income as dependent variable**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Prediction</th>
<th>One year ahead</th>
<th>Two years ahead</th>
<th>Three years ahead</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Coefficient</td>
<td>t-Stat.</td>
<td>Coefficient</td>
</tr>
<tr>
<td>REV</td>
<td>+</td>
<td>-0.075</td>
<td>-0.165</td>
<td>-0.173</td>
</tr>
<tr>
<td>ΔOPINC</td>
<td>?</td>
<td>-0.263</td>
<td>-3.221</td>
<td>-0.09</td>
</tr>
<tr>
<td>MB</td>
<td>?</td>
<td>-0.021</td>
<td>-0.628</td>
<td>-0.05</td>
</tr>
<tr>
<td>ASSETS</td>
<td>?</td>
<td>-0.015</td>
<td>-0.098</td>
<td>-0.297</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>88</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td></td>
<td>0.077</td>
<td>0.033</td>
<td>-0.029</td>
</tr>
</tbody>
</table>

**Panel B: Future change in cash flow from operations as dependent variable**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Prediction</th>
<th>One year ahead</th>
<th>Two years ahead</th>
<th>Three years ahead</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Coefficient</td>
<td>t-Stat.</td>
<td>Coefficient</td>
</tr>
<tr>
<td>REV</td>
<td>+</td>
<td>-0.415</td>
<td>-0.165</td>
<td>0.051</td>
</tr>
<tr>
<td>ΔCFO</td>
<td>?</td>
<td>0.318</td>
<td>0.967</td>
<td>-0.529</td>
</tr>
<tr>
<td>ΔWC</td>
<td>?</td>
<td>-0.073</td>
<td>-0.179</td>
<td>-0.091</td>
</tr>
<tr>
<td>MB</td>
<td>?</td>
<td>-0.136</td>
<td>-0.737</td>
<td>-0.039</td>
</tr>
<tr>
<td>ASSETS</td>
<td>?</td>
<td>-1.04</td>
<td>-1.16</td>
<td>-0.544</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>88</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td></td>
<td>-0.008</td>
<td>0.282</td>
<td>0.534</td>
</tr>
</tbody>
</table>
Notes:

$REV_t$ is the net increment to the revaluation balance from revaluations to fixed assets in year $t$, i.e., current year revaluations scaled by market value of $t-1$.

$\Delta OPINC_t$ is the operating income before depreciation, interest, taxes and gains on assets in year $t$, minus operating income in year $t-1$.

$\Delta WC_t$ is the working capital in year $t$ minus working capital in year $t-1$.

$MB_t$ is the market to book ratio at the end of fiscal year $t$, where the book value of equity excludes the revaluation balance.

$ASSETS_t$ is the log of book value of total assets, excluding the revaluation balance, at end of year $t$.

$\Delta CFO_t$ is the cash from operations in year $t$ minus cash from operations in year $t-1$.

One, two, and three years ahead refer to operating income or cash from operations in year $t+1$, $t+2$, and $t+3$ minus operating income or cash from operations in year $t$.

All variables, except for $MB_t$ and $ASSETS_{t-1}$, are deflated by market value of equity at the beginning of year $t$.

The regression equations include untabulated year specific intercepts.
Chapter 7: Discussion of Results

7.1 Discussion of Results

Table 6-3 presents regression summary statistics from Equations (1) and (2), which relate upward current year revaluations to future changes in a firm’s performance, including operating income and cash from operations. Panel A (Panel B) presents findings for future performance, defined as one, two- and three-year ahead operating income (cash from operations).

Table 6-3, Panel A, results show that current year revaluations are negatively associated with both one-year ahead (coefficient=−7.5%) future performance and two-year ahead (coefficient=−17.3%) and positively associated with three-year (coefficient= 37.2%) ahead future performance as measured by operating income, but not statistically significant. The adjusted R-squares for one, two and three years time horizons are 0.077, 0.033 and -0.029 respectively and the R-square value decreases from one-year ahead to two-year ahead and decreases to three-year ahead.

These findings are consistent with increases in the values of assets being realized over the three-year ahead, and with REV reflecting the value increases. The coefficient estimates on REV indicate that approximately 37.2% of revaluations are realized as increased operating income in the third year. These findings are consistent with our three-
year estimation horizon being too short to capture all of the increase in future operating performance associated with assets revaluations. The two-year horizon REV coefficient is less than both the one-year horizon coefficient, and the three-year horizon REV coefficient.

Panel A, also reveals that the year t change in operating income is negatively associated with one-year, two-year and three-year ahead changes in operating income (t-stat = -3.221, -0.983, and -0.815 respectively). The results of control variables, market-to-book ratios and total assets are inconsistent with future operating income for all three-year horizons. Market-to-book ratios and total assets are not significantly associated with one- and three-year ahead future performances and negatively associated with two-year ahead future performance (t-stat= -0.628, -1.364 and 0.619; and -0.098, -1.709 and 0.755 for one, two and three years ahead respectively).

Overall, the regression results for future operating income does not fully support Hypothesis (1) that there is an association between asset revaluation and the firm’s future operating income, as the test results show that it is not statistically significant. It provides evidence from New Zealand that is slightly at odds with the results of the study of Aboody et al., (1999) based on UK data and of Jaggi and Tsui (2001) based on Hong Kong data. As our sample scale is comparatively small\(^{17}\), compared to those of Aboody et al (1999) and Jaggi and Tsui (2001), and since the year 2001, some of the New Zealand firms have either merged or changed their business model during the scale of this research (between year 2001 and year 2005); therefore the whole sample of 179 firms cannot be taken into this

\(^{17}\) There are 12.03% New Zealand firms that applied upward asset revaluation during this observation (10 out of 88 firms), compared to U.K. 24.32% (1,334 out of 5,485 firms) and Hong Kong 87.55% (408 out of 466 firms) applied upward asset revaluation during their observations.
research. This may have caused a bias on our regression result. Secondly, there were only 10 firms which adopted asset revaluations in the year 2002, compared to 347 in the UK (Aboody et al, 1999) and 408 firms in Hong Kong (Jaggi and Tsui, 2001). Thirdly, it suggests that our data might not be comparable to other countries. This is because New Zealand firms tend to have concentrated ownership (see Chapter 2.6), and that would limit the generalizability of our results.

Table 6-3, Panel B presents summary statistics from estimating Equation (2), in which performance is measured by cash flow from operations. Panel B reveals that current year revaluations are negatively related to one-year ahead changes in cash flows from operations (t-stat = -0.165) and positively associated with two- and three-year ahead changes in cash flow from operations (t-stat = 0.069 and 0.040) but are not statistically significant.

The positive coefficient of REV on two- and three-year ahead is interpreted to mean that it corroborates the findings of revaluation regression to some extent, but the evidence is not statistically significant.

Regarding the control variables, Panel B reveals that the changes in working capital and market-to-book ratio are almost all not significantly negatively associated with change in cash flow from operations for all three horizons, respectively. ¹⁸ The year t change in cash

¹⁸ To test whether the significant relations between revaluations and future performance relate to the act of revaluation, rather than the magnitude of the revaluation, we estimated Equations (1) and (2) using all firms
flow from operations is positively associated with the one year ahead cash flow from operations, but negatively associated with two and three years ahead. Total assets are significantly negatively associated with future cash flow from operations for all three-year horizons.

These findings corroborate those in Panel A in indicating that a conclusion can not be drawn as to whether current year revaluations are associated with future firm performance in New Zealand, because the results show that the association not statistically significant.

7.2 Tests for Market Assessment of Revaluation

7.2.1 Share Price

Following prior research, it has been argued that share prices are affected by the information contained in financial statements of the firm at a point in time. (e.g. Aboody et al., 1999). If asset revaluations reflect a fair value of assets on which the future performance of the firm can be predicted, this value should align with information implicit in stock prices. Therefore, a positive association between share prices and asset revaluation contained in financial statements was expected. The following models were used to test the association between share prices and revaluation balances of a firm:

with available data and included an indicator variable that equals one if a firm revalued its assets in a given year, and zero otherwise.
\[ \text{PRICE}_{it} = \sum_{2002}^{2005} \lambda_0 Y_{Yit} + \lambda_1 \text{REV}_{it} + \lambda_2 \text{EPS}_{it} + \lambda_3 \text{BVPS}_{it} + \xi_{it} \]

(3)

PRICE \(_{it}\) is share price three months after the fiscal year \(t\) and REV \(_{it}\) is the net increment to the revaluation balance at the end of year \(t\). EPS is earnings per share from continuing operations and BVPS is book value per share of equity, excluding the revaluation reserve balance. Based on previous research studies (e.g. Aboody et al, 1999; Jaggi and Tsui, 2001), the variables EPS and BVPS were included in the regression to control for their effects on PRICE \(_{it}\). The positive coefficient of control variables was expected (Aboody et al., 1999).

### 7.2.2 Returns

Managers have considerable discretion with regard to the timing of revaluing assets. It is, therefore, of interest to examine whether revaluations are undertaken when the underlying changes take place in the asset values. The timing of revaluations will be evaluated by testing the association between stock returns and current year revaluations (REV \(_{it}\)). The following model developed by Aboody et al (1999) is used to test this association:
\[
\text{RETURN}_t = \sum_{2002}^{2005} \gamma_{m} \text{YR}_m + \gamma_{2} \text{REV}_t + \gamma_{3} \text{NI}_t + \gamma_{4} \Delta \text{NI}_t + \eta_t
\]

(4)

RETURN is the firm’s year \( t \) share return, measured from three months after year end for year \( t-1 \) to three months after year end for year \( t \) [defined as (share price \( t \) + dividends \( t \) - share price \( t-1 \))/share price \( t-1 \)], and NI is net income. \( \Delta \text{NI}_t \) is NI \( t \) minus NI \( t-1 \) and other variables are the same as previously defined. Independent variables, REV \( ti \), NI \( ti \) and \( \Delta \text{NI}_ti \) are deflated by the market value of equity at the beginning of the year \( t \). Similar to Equations (1) and (2), separate fiscal year intercepts are estimated (Aboody et al., 1999).

If revaluations provide at least some timely value relevant information, the association between REV \( ti \) and RETURN \( ti \) will be positive, otherwise, it will be negative. Based on prior research (e.g. Aboody et al., 1999), REV, NI and \( \Delta \text{NI} \) were expected to have positive coefficients.

7.2.3 Findings from Market Assessment

Regression summary statistics from Equations (3) and (4) are presented in Table 7-1 below.
Table 7-1: Summary Statistics from Fixed Effect Regression on Prices and Returns

Panel A: Share Prices as Dependent Variable

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Prediction</th>
<th>Coefficient</th>
<th>t-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>REV</td>
<td>+</td>
<td>4.68</td>
<td>0.40</td>
</tr>
<tr>
<td>EPS</td>
<td>+</td>
<td>0.09</td>
<td>0.01</td>
</tr>
<tr>
<td>BVPS</td>
<td>+</td>
<td>-1.79</td>
<td>-0.98</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Adj. R2</td>
<td></td>
<td>0.25</td>
<td></td>
</tr>
</tbody>
</table>

Panel B: Returns as Dependent Variable

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Prediction</th>
<th>Coefficient</th>
<th>t-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>REV</td>
<td>+</td>
<td>0.73</td>
<td>0.49</td>
</tr>
<tr>
<td>NI</td>
<td>+</td>
<td>1.18</td>
<td>0.26</td>
</tr>
<tr>
<td>ΔNI</td>
<td>+</td>
<td>-2.99</td>
<td>-0.42</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Adj. R2</td>
<td></td>
<td>0.12</td>
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</tr>
</tbody>
</table>

Notes: Share price is measured three months after the end of year t. Returns are measured from three months after year end for year t-1 to three months after year end for year t. EPS is earnings per share. BVPS is the book value of equity, excluding the revaluation balance, per share. REV is the current year revaluations made in year t. NI is net income; ΔNI is NI in year t minus NI in year t-1. All independent variables in Equation (4) are deflated by the market value of equity at the beginning of year t.

The price regression equation includes untabulated firm and year specific intercepts.

The returns regression equation includes untabulated year specific intercepts.

Regression summary statistics from Equation (3) on the relations between share prices and the level of revaluation balances are presented in Panel A of Table 7-1. As predicted, revaluation increments are positively related to share prices, after controlling for earnings and book value of equity, but are not statistically significant. The results of the control variables indicate that the coefficient of EPS is positive and BVPS is negative.
The price regression results also indicate that investor's assessment aligns with the manager’s motives for revaluations. These results are interpreted to mean that investors perceive revaluations to reflect a fair value of assets to some extent.

Table 7-1, Panel B, presents summary statistics from estimating Equation (4). We find that REV has a positive coefficient and indicates that current year revaluations are positively associated with returns, but are not statistically significant (t=0.49). The positive coefficient on REV indicates that upward revaluations reflect at least a portion of asset value changes on a timely basis. Results on control variables indicate that the level of income NI is positively related to the stock returns (t-statistic =0.26). The income change ∆NI is negatively related (t-statistic =-0.42) to returns, which is contrary to our expectations.

The result supports Australia and New Zealand’s previous findings. For example, Barth and Clinch (1998, table 7) did not find that revaluations of plant, property and equipment were value relevant in their tests. However, due to the magnitude of the intangible revaluations in our sample, investors may view these intangible asset revaluations with suspicion (e.g., Courtenay and Cahan, 2004). We advise caution in this interpreting of the return result, as we did not separate the intangible components in our revaluation sample.

7.3 Sensitivity Tests
Unequal sample size between firms which applied upward asset revaluation and those which did not could be a concern. This is because the earlier results could have been driven by the fact that the non-revaluers contained more firms than revaluers and therefore had more statistic power. Two sensitivity checks were carried out in order to test the robustness of our results to variations in the research design. First, in order to test whether our results were sensitive to the deflator- market value of equity, an additional test was conducted in which all variables OPINC, WC were deflated by total assets instead of the market value of equity at the beginning of year t.

The summary statistics of 88 samples are provided in Table 7-2 (See: Appendix)

In Table 7-2, the regression results on future performance indicate that the REV coefficients for both operating income and cash flow from operations are almost all positive for all three years ahead, except for the two-year ahead cash flow from operations (coefficient=-0.024), which is not significantly negatively associated with REV on year 2002. By using total assets as a scale instead of market value of equity in the model, the result is similar in that the current year’s asset revaluation is associated with future operating performance, but is not statistically significant. The result generally agrees with overseas studies (e.g. UK and Hong Kong). However, the result does not show a significant association between current year asset revaluation and future operating performance.
Investors may view intangible asset revaluations with suspicion\textsuperscript{19}; therefore, it has also been argued that total tangible assets may be an appropriate deflator rather than total assets. To alleviate this concern, therefore, total tangible assets instead of total assets were chosen to conduct a further test, as shown in Table 7-3 (See: Appendix).

The result in Table 7-3 shows that both the operating income and cash flow from operations are almost identical with the variables deflated by total assets on Table 7-2. All three years ahead operating income and cash flow from operations are shown as positive, except two-year ahead cash flow from operations (coefficient=-0.001, compared to -0.024 on the Table 7-2), but not statistically significant.

\textsuperscript{19} Investors may view these intangible asset revaluations with suspicion (e.g., Courtenay and Cahan, 2004). Their evidence indicates that particularly upward revaluations of intangible assets are significantly negatively related to returns [Equation (8), pp232, Pacific-Basin Finance Journal 12 (2004)].
Chapter 8: Summary and Conclusion

8.1 Overview of the research

This thesis investigates the association between asset revaluation and future firm performance in New Zealand, measured by the operating income and cash flow from operations for the three subsequent years after asset revaluations.

Share prices reflect the investor’s assessments of asset values and expectations about future operating performance. However, they also indicate that valuation affects firms’ investing and financing decisions. Therefore, market assessment only provides indirect evidence about the relation between asset revaluations and future changes in operating performance (Aboody et al, 1999).

8.2 Main findings of the research

The findings in this study provide no conclusive evidence that upwards asset revaluations by New Zealand firms are associated with future operating performance, as the associations are not statistically significant.

Nevertheless, our results are consistent with previous research that share price is related to asset revaluation, but is not statistically significant. The relation between revaluation and annual returns was tested. It provides some evidence that asset revaluations are related to
returns, although it is not statistically significant, suggesting that upward revaluation by New Zealand firms, at least for a portion of asset value, changes on a timely basis. However, given the small number of upward asset revaluations in this test, we are reluctant to interpret this result. Rather, further research in this area is encouraged.

The sensitivity tests are consistent with previous findings that current year revaluations are associated with both operating income and cash flow from operations, but are not statistically significant.

The descriptive statistic result shows that the finding is consistent with that of Cotter and Zimmer (1995), and companies, which revalued their assets were those that experienced declining cash flows from operations. The control variables for current changes in performance, risk, growth and size were tested.

The evidence does not indicate that asset revaluation is associated with a firm’s future performance in New Zealand. We infer this may be caused by the comparatively concentrated ownership of New Zealand firms. The results constitute one piece of evidence that New Zealand managers might consider when, or if they apply asset revaluation. The evidence also provides input into the debate over disclosing assets at estimated value or depreciated historical cost, although NZ IAS 16 now allows a firm to choose to record assets at historical cost or estimated market value.
8.3 Limitations and suggestions for future research

Investigating the association between asset revaluations and operating performance has its limitations in this research. For example, only a few years of realized operating income and cash flow from operations data were available, which limited the tests to future years and reduced our ability to detect a significant relationship between upward asset revaluation and future performance. Lack of availability of subsequent data and information prevented us from designing more refined tests relating to performance effects specific to particular assets. It may be dangerous to make generalizations from such a small sample (there were only 12.03% of New Zealand firms applying asset revaluation in this observation), and the author acknowledges this limitation. Findings for each horizon were presented, even though they are not independent, because it is uncertain when the future performance effects will be evident, which leaves potential for future comprehensive investigation of this finding.
References


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## APPENDIX

Table 7-2: Summary regression statistics on future performance  
(Sample of 88 NZ firms on year 2002)

### Panel A: Future change in operating income as dependent variable

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>REV</td>
<td>+</td>
<td>0.022</td>
<td>0.431</td>
<td>0.059</td>
<td>1.366</td>
<td>0.017</td>
<td>0.11</td>
</tr>
<tr>
<td>∆OPINC</td>
<td>?</td>
<td>-0.172</td>
<td>-18.979</td>
<td>0.03</td>
<td>3.881</td>
<td>0.198</td>
<td>7.051</td>
</tr>
<tr>
<td>MB</td>
<td>?</td>
<td>0.006</td>
<td>0.004</td>
<td>-0.003</td>
<td>-1.02</td>
<td>-0.007</td>
<td>-0.641</td>
</tr>
<tr>
<td>ASSETS</td>
<td>?</td>
<td>0.044</td>
<td>0.018</td>
<td>-0.047</td>
<td>-3.086</td>
<td>-0.064</td>
<td>-1.149</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>N</strong></td>
<td></td>
<td><strong>88</strong></td>
<td></td>
<td><strong>88</strong></td>
<td></td>
<td><strong>88</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Adj. R²</strong></td>
<td></td>
<td><strong>0.837</strong></td>
<td></td>
<td><strong>0.279</strong></td>
<td></td>
<td><strong>0.407</strong></td>
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### Panel B: Future change in cash flow from operations as dependent variable

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>REV</td>
<td>+</td>
<td>0.026</td>
<td>0.305</td>
<td>-0.024</td>
<td>-0.254</td>
<td>0.026</td>
<td>0.401</td>
</tr>
<tr>
<td>∆CFO</td>
<td>?</td>
<td>0.078</td>
<td>1.894</td>
<td>-0.616</td>
<td>-13.34</td>
<td>0.377</td>
<td>11.941</td>
</tr>
<tr>
<td>∆WC</td>
<td>?</td>
<td>-0.048</td>
<td>-0.439</td>
<td>-0.031</td>
<td>-0.257</td>
<td>-0.048</td>
<td>-0.565</td>
</tr>
<tr>
<td>MB</td>
<td>?</td>
<td>-0.002</td>
<td>-0.349</td>
<td>-0.001</td>
<td>-0.129</td>
<td>0</td>
<td>-0.088</td>
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<tr>
<td>ASSETS</td>
<td>?</td>
<td>-0.074</td>
<td>-2.563</td>
<td>0.032</td>
<td>0.996</td>
<td>-0.037</td>
<td>-1.613</td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>N</strong></td>
<td></td>
<td><strong>88</strong></td>
<td></td>
<td><strong>88</strong></td>
<td></td>
<td><strong>88</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Adj. R²</strong></td>
<td></td>
<td><strong>0.135</strong></td>
<td></td>
<td><strong>0.705</strong></td>
<td></td>
<td><strong>0.663</strong></td>
<td></td>
</tr>
</tbody>
</table>
Notes:

$REV$ is the net increment to the revaluation balance from revaluations to fixed assets in year $t$, i.e., current year revaluations scaled by market value of $t-1$.

$\Delta OPINC$ is operating income before depreciation, interest, taxes and gains on assets in year $t$, minus operating income in year $t-1$.

$\Delta WC$ is working capital in year $t$ minus working capital in year $t-1$.

$MB$ is market to book ratio at the end of fiscal year $t$, where book value of equity excludes the revaluation balance.

$ASSETS$ is the log of book value of total assets, excluding the revaluation balance, at end of year $t$.

$\Delta CFO$ is cash from operations in year $t$ minus cash from operations in year $t-1$.

One, two, and three years ahead refer to operating income or cash from operations in year $t+1$, $t+2$, and $t+3$ minus operating income or cash from operations in year $t$.

All variables, except for $MB$ and $ASSETS$, are deflated by the total assets at the beginning of year $t$.

The regression equations include untabulated year specific intercepts.
Table 7-3: Summary regression statistics on future performance
(Sample of 88 NZ firms on year 2002)

**Panel A: Future change in operating income as dependent variable**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Prediction</th>
<th>One year ahead</th>
<th>Two years ahead</th>
<th>Three years ahead</th>
</tr>
</thead>
<tbody>
<tr>
<td>REV</td>
<td>+</td>
<td>0.048</td>
<td>0.684</td>
<td>0.148</td>
</tr>
<tr>
<td>∆OPINC</td>
<td>?</td>
<td>-0.178</td>
<td>-14.406</td>
<td>0.028</td>
</tr>
<tr>
<td>MB</td>
<td>?</td>
<td>0.007</td>
<td>1.447</td>
<td>-0.004</td>
</tr>
<tr>
<td>ASSETS</td>
<td>?</td>
<td>0.029</td>
<td>1.243</td>
<td>-0.089</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>88</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>Adj. R²</td>
<td></td>
<td>0.737</td>
<td>0.252</td>
<td>0.263</td>
</tr>
</tbody>
</table>

**Panel B: Future change in cash flow from operations as dependent variable**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Prediction</th>
<th>One year ahead</th>
<th>Two years ahead</th>
<th>Three years ahead</th>
</tr>
</thead>
<tbody>
<tr>
<td>REV</td>
<td>+</td>
<td>0.006</td>
<td>0.059</td>
<td>-0.001</td>
</tr>
<tr>
<td>∆CFO</td>
<td>?</td>
<td>0.066</td>
<td>1.405</td>
<td>-0.624</td>
</tr>
<tr>
<td>∆WC</td>
<td>?</td>
<td>-0.155</td>
<td>-1.541</td>
<td>0.026</td>
</tr>
<tr>
<td>MB</td>
<td>?</td>
<td>-0.003</td>
<td>-0.411</td>
<td>-0.001</td>
</tr>
<tr>
<td>ASSETS</td>
<td>?</td>
<td>-0.095</td>
<td>-3.041</td>
<td>0.014</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>88</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>Adj. R²</td>
<td></td>
<td>0.098</td>
<td>0.668</td>
<td>0.547</td>
</tr>
</tbody>
</table>
Notes:

$REV$ is the net increment to the revaluation balance from revaluations to fixed assets in year $t$, i.e., current year revaluations scaled by market value of $t-1$.

$\Delta OPINC$ is operating income before depreciation, interest, taxes and gains on assets in year $t$, minus operating income in year $t-1$.

$\Delta WC$ is working capital in year $t$ minus working capital in year $t-1$.

$MB$ is market to book ratio at the end of fiscal year $t$, where book value of equity excludes the revaluation balance.

$ASSETS$ is the log of book value of total assets, excluding the revaluation balance, at end of year $t$.

$\Delta CFO$ is cash from operations in year $t$ minus cash from operations in year $t-1$.

One, two, and three years ahead refer to operating income or cash from operations in year $t+1$, $t+2$, and $t+3$ minus operating income or cash from operations in year $t$.

All variables, except for $MB$ and $ASSETS$, are deflated by the total Tangible assets at the beginning of year $t$.

The regression equations include untabulated year specific intercepts.