Fixed Asset Revaluation: Management Incentives and Market Reactions

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Abstract of a thesis submitted in partial fulfilment of the requirements
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Fixed Asset Revaluation: Management Incentives and Market Reactions

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There is a lack of relevant research of fixed assets revaluation practices in New Zealand. This study provides some insights as (1) why some New Zealand firms choose to revalue their fixed assets; (2) when will a firm revalue its fixed assets; and (3) whether fixed asset revaluation provides information to investors. This research attempts to explain the motivations of the management's fixed asset revaluation decision in New Zealand. The empirical analysis includes five common explanatory variables, such as gearing (debt-equity ratio), liquidity, market-to-book ratio, firm size, and fixed asset intensity. In addition, the relationship between asset revaluation and share price movements of the firms are examined to determine the perceived usefulness of fixed asset revaluation information for the capital market in New Zealand.

The study results show that fixed asset intensity and firm size significantly contribute to the revaluation decision. In contrast to the findings of previous studies (Whittred and Chan, 1992; Brown, Izan, and Loh, 1992; and Missionier-Piera, 2007), the level of corporate gearing is negatively related to the probability of revaluing assets for the sample of New Zealand firms in this study. However, the effect of the level of gearing on the revaluation decision is insignificant. The empirical results did not show any significant outcomes and relationships for investigated year 1998. This is because 1998 signified the end of recession and the beginning of economic growth in New Zealand. At the end of a recession, the changes in the country's economic environment might have superseded individual firms' considerations in management decision making process.

The empirical results show that the practice of revaluation increased sharply with the adoption of the IFRS in 2005 in New Zealand. About 28.1% of the revaluation

announcements under study were made in 2005 compared to just over 15.8% in 2001. Furthermore, the empirical results show negative returns accrue to firms prior to the publication of financial statements that carry revaluation announcements. These negative returns are reverted as soon as the revaluation information is made public. These gains are again maintained for at least a month after the announcements are made. Comparing frequent revaluers to first time revaluers, the results show that asset revaluation information is relevant to investors. Frequent revaluers gained only 0.8% announcement abnormal returns while First time revaluers gained over 4% in the 2005.

Keywords: fixed asset revaluation, management incentives, market reaction.

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CHAPTER 1

INTRODUCTION

1.1 Background

Non-current assets, also referred to fixed assets, are assets which have been purchased by firms with the intention of being held or used for a period longer than one year from balance date. Fixed assets are not intended for resale in the normal course of trading. Contrary to current assets, fixed assets do not consist cash or other assets that are reasonably expected to be converted into cash, sold or consumed by the firms within their operating cycle or within 12 months of the balance date (Clark, Maguire, and Davies, 2006). Fixed assets with finite useful lives will gradually lose their value over time because of age, wear, or market conditions. Firms, therefore, are required to recognise the loss of value of those assets across their useful lives (White, Sondhi, and Fried, 1998).

New Zealand Financial Reporting Standard No. 3 *Accounting for Property, Plant and Equipment* (FRS 3) defines depreciation as "the consumption of the economic benefits embodied in an asset whether arising from use, the passing of time or obsolescence" (ICANZ, 2002, Section 4.22). There are two major purposes of depreciation. The first major purpose is to distribute the cost of fixed assets to income over a period to achieve the accurate measurements of income and the second major purpose of depreciation is to retain funds of a business by reducing income and thereby reducing the distribution of dividend to shareholders (Westwood, 1995). FRS 3 requires the depreciation of all depreciable assets to be charged to the profit and loss account on a systematic basis throughout the useful life of the assets. Thus, depreciable assets such as buildings, machines, furniture, computers, office equipments and motor vehicles are entitled to the favourable tax treatment or depreciation allowance over current assets (Wikipedia, 2006a).

Fixed assets are depreciated based on their estimated useful lives and residual values. Due to the fact that the estimated useful life and residual value of a fixed asset may change over time, firms are required to make adjustment if they become aware that the estimated useful life or residual value of that asset is likely to vary significantly. Likewise, the value of fixed assets may vary from time to time. Therefore, firms may wish to revalue their fixed assets to reflect the changes in the value of their fixed assets to reflect the market worth of their property assets.

Asset revaluation refers to the reconsideration of the value of an asset and adjusts the book value of that asset to its current value (Brown, Izan, and Loh, 1992). Fixed asset revaluation can be either upward (revaluation increments) or downward (revaluation decrements). Upward revaluation is the restatement of the book value of an asset to the extent that it does not exceed its net current value or recoverable value. In short, an upward revaluation refers to the incremental value of an asset's book value whereas downward revaluation means that the net current value of the asset has fallen below its book value. An upward revaluation of fixed-assets increases the value of shareholders' equity and the value of the fixed-assets involved. Upward revaluations also decrease financial-leverage ratios, such as debt-equity ratios.

When an asset is revalued, any increased amount of depreciation as a result of the revaluation will be debited to 'Revaluation Reserve'. Likewise, whenever the revalued asset is sold, the loss encountered due to the revaluation will be debited to 'Revaluation Reserve'. The increment or decrement amount of each class of assets as a result of revaluation will be shown in the Balance Sheet for a specified number of years and the increased/decreased value of assets will be shown in place of their original cost in the Balance Sheet (Westwood, 1995).

If a fixed asset's book value is increased as a result of the revaluation, the increased amount should be credited directly to equity under the heading of 'Revaluation Reserve'. If the fixed asset's book value is decreased as a result of a revaluation, the decreased amount should be recognised in the Profit & Loss account. However, in case of an upward revaluation of a fixed asset which has been previously subject to downward revaluation, the increased value

of the asset should be recognised in the Profit & Loss account to the extent that it reverses the revaluation decrement of the same asset which is previously recognised in the Profit & Loss account. Similarly, in case of a downward revaluation of a fixed asset which has been previously subject to upward revaluation, the decreased amount should be recognised in the 'Revaluation Reserve' to the extent that it reverses the credit balance of that asset in the 'Revaluation Reserve' (Courtenay and Cahan, 2004).

1.1.1 Underlying Rationale of Revaluation Decisions

The justification for the revaluation of fixed-assets by firms is to assure that the fair value of fixed-assets is reflected in the firm balance sheets. There are different factors that have been found by prior researchers (for example, Watts and Zimmerman, 1990; Brown et al., 1992) for asset revaluation decisions. These include desire to increase borrowing capacity, takeover threats, issuance of bonus shares, likelihood of the violation of debt covenant, indebtedness, labour strikes, decline in the operating cash flow, growth prospect, and liquidity (Lin and Peasnell, 2000a). There are also a number of motivations for revaluing assets, for example, (1) to show the true rate of return on capital employed; (2) to show fair market value of the assets employed in case of sale and leaseback transaction; (3) to retain adequate fund in the firm for future replacement of fixed assets. The depreciation of assets based on the historical cost will result in greater profit which leads to excessive dividend payment; (4) to obtain bargaining power for fair value of assets before merging with or take over by another firm; and (5) for proper internal or external reconstruction (Wikipedia, 2006b).

1.1.2 Fixed Asset Revaluation and Share Price Movements

Fixed asset revaluation information could be useful for investors' decision-making. The efficient market hypothesis provides the rational for understanding changes in the market prices of financial assets. The efficient market hypothesis postulates that at any given time, financial asset prices fully reflect all available information. The hypothesis implies that all investors have access to all relevant information and that all investors use that information efficiently (Brealey and Myers, 2004). Hence, the revaluation of fixed asset which provides more relevant information for investors would result in the changes of the share prices of a firm (Sharpe and Walker, 1975).

1.1.3 Revaluation Practice in New Zealand

Revaluation of fixed assets can provide users of financial statements with more timely and

relevant financial information than the valuation based on original transaction cost (White et al., 1998). As recorded in FRS-3, "Items of property, plant and equipment are often a major portion of the total assets of an entity and therefore significant in the presentation of its position…recognising changes in the value of items of property, plant, and equipment is considered to provide relevant information to users of financial reports" (ICANZ, 2002, Section 1.3 -1.4).

To date, fixed asset revaluations remain prohibited in the U.S. Unlike in U.S., firms in New Zealand are given options for fixed asset revaluation (Easton, Eddey, and Harris, 1993). In New Zealand, all fixed assets acquired by firms are required to be initially recorded at their original transaction cost and the firms may choose to revalue the fixed assets in a subsequent period (Westwood, 1995).

Firms are allowed to revalue their fixed assets, provided that fair value is used. 'Fair Value' is commonly known as 'Market Value', 'Open Market Value', and 'Current Market Value' (The Treasury, 2006). According to FRS 3, "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" (ICANZ, 2002, Section 4.23). Hence, fair value of a fixed asset could be determined by referring to its current market price or price in an active market for the similar asset. In cases where market-based evidence of fair value of a fixed asset is not available, depreciated replacement cost (DRC) could be used as a proxy to determine the fair value of that asset.

Selective revaluation happens when firms choose to revalue selected tangible asset(s). The revaluation of particular assets will result in situations where only selected assets will be shown at current values (Wikipedia, 2006b). Although firms in New Zealand may choose to revalue their fixed assets, FRS 3 states that where a revaluation policy is adopted by a firm, it must be applied to the whole class of fixed assets. Once a firm has chosen to revalue its fixed assets, it is required to continue revaluing the relevant classes of assets on a cyclical basis (at least every five years). This is to avoid situations where firms may choose to revalue selected fixed assets and inconsistency in the treatment of the similar assets.

Besides, when a fixed asset is revalued, firm is required to keep the valuation of the asset up-to-date. NZ IAS 16 requires frequent revaluations for assets which experience volatile changes in their fair value (NZICA, 2004). Further revaluation should be carried out if the fair value of an asset is differing materially from its revalued amount. In addition, it is required to use independent qualified valuer for revaluations, except for the valuations of plant and equipment where there is an active market or readily available price for such assets. When the valuation is conducted by an internal qualified valuer, the basis of valuation will be subjected to review by an independent valuer (Deloitte, 2001).

1.2 Motivations and contributions of the study

Many studies have focused on management incentives to revalue assets, but little attention has been paid to the usefulness of fixed asset revaluation information from users' perspective. According to Emanuel (1989, p 213), "regardless of the motivation...it has been commonly argued that current values are more useful for investment and managerial decision-making than historical cost based numbers".

Fixed asset revaluation as part of the current cost accounting should be useful to decision makers. Several studies have been conducted in the past with the aim of determining the effect of the fair value (current cost) accounting information has on the decision making process of investors. Duncan and Moores (1988) conducted a study in New Zealand to test whether current cost accounting (CCA) information is useful for investor decision making. They use a post-test, control group design in their study and their study results showed that CCA information offer more relevant information for investor decision-making. Carroll and Linsmeier (1997) investigated the relationship between the fair value accounting information and the stock price. In their study, a sample of 143 closed-end mutual funds during 1983-1997 was selected to examine the relevance of fair value accounting to investors. Evidence in their study indicated a significant correlation between fair value of investments and stock prices, after controlling for historical costs. Hence, if fixed asset revaluation information is

useful one would expect to see a relationship between asset revaluation information and the share price movements of the firm.

While valid and justifiable reasons exist for fixed-asset revaluation by publicly-traded firms, asset revaluation may be undertaken by some firms on an opportunistic basis to bring maximal benefits to their firms (Standish and Ung, 1982). The reliability of the financial statements will be impaired and the users of the financial reports will be misled if the revaluation policy is selected due to the managerial self-interest (Aboody, Barth, and Kasznik, 1999).

Numerous studies have been conducted to investigate the underlying motivations of the management for asset revaluations (see Whittred and Zimmer, 1986; Watts and Zimmerman, 1990; Brown et al., 1992; Whittred and Chan, 1992; Easton et al., 1993; Cotter, 1999; Lin and Peasnell, 2000a; Lin and Peasnell, 2000b). For example, Whittred and Zimmer (1986) demonstrated that management may have incentive to inflate assets to avoid being in technical default of its debt agreement whereas Cotter (1999) examined whether Australian firms revalue their assets to reduce debt contracting costs in the current institutional setting and his results showed that asset revaluation decisions of the firms are no longer related to the incentives to reduce the probability of default on debt covenants. Despite these, New Zealand-specific research regarding fixed asset revaluation practice remains very limited.

Firms could initiate upward fixed-asset revaluations to generate additional borrowing capacity in situations where management is aware that financial-leverage positions likely will preclude future borrowing (Brown et al., 1992; Cotter, 1999; Lin and Peasnell, 2000b). Lin and Peasnell (2000a) argue that the existence of slender cash resources would restrict a firm's investment opportunities. Hence, "revaluations can provide relief by providing more up to date information on cash that could be raised from selling the assets and thereby enhancing borrowing capacity" (p369). The study by Lin and Peasnell includes 1989 and 1991 sample and this does not reflect current practice. Accounting regulation and trends have changed significantly since the late 1990s. It is unclear whether the factors that motivated revaluations have persisted over time.

Upward asset revaluations could be used as a means to provide credible signal of the undervaluation of the assets and indication of better prospects of the firms (Aboody et al., 1999; Gaeremynch and Veugelers, 1999). Hence, revaluations may be conducted by some asset-rich firms with poor earning to distinguish themselves from unprofitable firms (Lin and Peasnell, 2000a).

Cotter and Zimmer (1995) examined the additional factors associated with revaluation practices of Australian firms from 1980-1984. Using a sample of 100 firms randomly selected from data supplied by Whittred and Chan (1992), the authors found that asset revaluations are associated with the increasing levels of secured debt. The authors also found a relationship between the declining cash flow and asset revaluations, leading to the conclusion that (1) firms undertake revaluations to signal borrowing capacity to the lenders, and (2) the revaluers are more likely to be experiencing declining cash flows from operations than non-revaluers.

1.3 Purpose of the Study

There is a lack of relevant research of fixed assets revaluation practices in New Zealand. This study provides some insights as (1) why some New Zealand firms choose to revalue their fixed assets; (2) when will a firm revalue its fixed assets; and (3) whether fixed asset revaluation provides information to investors. This research attempts to explain the motivations of the management's fixed asset revaluation decision in New Zealand. To accomplish this objective, this study focuses on New Zealand's firms and adopts the research framework used in Lin and Peasnell's (2000a) study. The empirical analysis includes five common explanatory variables, such as gearing (debt-equity ratio), liquidity, market-to-book ratio, firm size, and fixed asset intensity. Equity depletion is excluded from the study although it was part of Lin and Peasnell (2000a) study. The reason for this is that Lin and Peasnell's study looked at revaluation at a time when firms in Britain were required to treat goodwill in accordance with FRS 10. Their sample consisted of firms drawn from 1989 and 1991 sample. At that time the common but controversial practice was for firms to write off purchased goodwill to equity reserves directly. Post 2001, the IFRS was introduced and the

prescriptions for treating goodwill changed significantly. Goodwill is currently not capitalised and amortised as was done under FRS 10 in 1989 and 1991.

In addition, the relationship between asset revaluation and share price movements of the firms would be examined to determine the perceived usefulness of fixed asset revaluation information for the capital market in New Zealand. To accomplish this objective, this study adopts the research framework used in Sharpe and Walker's (1975) study.

1.4 Research Questions and Hypotheses

The research questions and hypotheses are given as follows:

1.4.1 Management Incentives

Research Question One

What is the relationship between fixed-asset revaluation and the gearing of the publicly traded firms in New Zealand?

Hypothesis One

H1: Fixed-asset revaluation is positively related to a firm's debt-equity ratio.

Research Question Two

What is the relationship between fixed-asset revaluation and liquidity of publicly traded firms in New Zealand?

Hypothesis Two

H2: Fixed-asset revaluation is negatively related to the liquidity of a firm.

Research Question Three

What is the relationship between fixed-asset revaluation announcements and market-to-book ratios of publicly traded firms in New Zealand?

Hypothesis Three

H3: Fixed-asset revaluation is positively associated with the market-to-book ratio of a firm.

Research Question Four

What is the relationship between fixed-asset revaluation and the size of the publicly traded firms in New Zealand?

Hypothesis Four

H4: Fixed-asset revaluation is positively related to the size of a firm.

Research Question Five

What is the relationship between fixed-asset revaluation and the fixed asset intensity of the publicly traded firms in New Zealand?

Hypothesis Five

H5: Fixed-asset revaluation is positively associated with a firm's fixed asset intensity.

1.4.2 Market Reaction

Research Question Six

What is the relationship between fixed-asset revaluation announcements and share price movements of publicly traded firms in New Zealand?

Hypothesis Six

H6: There is a positive relationship between fixed-asset revaluations and share price movements.

1.5 Thesis Outline

Chapter Two discusses an overview of the literature relevant to the problems investigated. Chapter Three discusses in detail the research hypotheses, the theoretical and empirical model and the data. The results and discussion of the research findings are presented in Chapter Four. Chapter Five presents a summary of the major findings from the research, the research implications, policy inferences, the research limitations, and recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Fixed asset revaluation has long been a debatable issue. The common argument in accounting characterises fair values of assets as being more relevant but less reliable than their historical costs. Lawrence and Henry (as cited in Chatfield 1974, p235), both prominent accounting theorists in the early 1900s, shared the view that fixed assets should be valued at historical cost because they are not intended for sale. Although fixed assets are not held for sale as such, investors who buy stocks in the firm actually buy a portion of the assets of the firm in the expectation that that portion will generate returns sufficient to compensate them for the risk they take. Therefore, it may be important that investors can ascertain the real value of the assets of the firm they want to invest in. This will only be possible if historical costs are adjusted to represent current underlying asset values.

Whether firms should be allowed to revalue their assets, especially upward revaluation, has been fairly discussed in accounting literature. The debate centred on whether firms should carry historical costs or fair values in their books. Accounting standards and practices around the world are divided on whether upward revaluation of assets should be allowed in the accounting books. A number of countries, such as the United States and Canada, do not allow upward revaluation of fixed assets. While other countries are allowed, under certain conditions, including Australia, Belgium, Spain, France, Hong Kong, Italy, Japan, New Zealand, the Netherlands, India, Switzerland, and the United Kingdom (Missonier-Piera, 2007). A recent article reports that there are about 48 countries where upward revaluation of noncurrent assets is allowed (Barlev, Fried, Haddad, and Livnat, 2007).

However, such revaluations are not without costs. Henderson and Goodwin (1992) identify a number of such elements which make up the costs of revaluation. These include cost of obtaining an estimate of a fair value of the asset in question, higher audit fees and also costs involved in terms of the time, and money spent during negotiations. Apart from these direct

costs, there are also some other indirect costs that may arise from the decision to revalue assets. One of such indirect costs is the impact of the revaluation on the financial statements. In terms of its effects on the financial statements, revaluations substantially increase the asset base of a firm. If other variables (such as the level of profits) remain constant, management's performance (measured by the Return on Assets (ROA)) will be perceived to have declined. Shareholders or investors interested in smaller firms may be warded off by substantial increases in asset values. As the firm grows bigger (increased asset values), the relationship between individual shareholders and management increases (Missonier-Piera, 2007).

The International Accounting Standards Board (IASB) faced strong objections when it introduced fair value accounting into two non-financial fields: investment property and agriculture (Barlev et al., 2007). Because of the strong criticism, the board was compelled to allow a dual accounting system using either fair value or historical cost accounting (Barlev et al., 2007). The difficulty faced by the IASB in instituting its proposed fair value accounting standard reflects how thorny the issue is, and any move to standardise practice across countries will invite criticism and obstacles. A number of research papers have explored whether such revaluations should be allowed. In their study, Henderson and Goodwin (1992) argue against the use of noncurrent asset revaluation on the basis that it is theoretically unsound. They also find that the cost of asset revaluations far outweighs any benefits that may be obtained from the process. Today, the IASB allows for the adoption of various methods of valuation including current replacement cost, net realisable value and historical costs (net book values). The emphasis is that whichever method is adopted must be used consistently.

2.2 Motives of Fixed Asset Revaluation

In spite of criticisms, fixed assets revaluation is widely carried out in countries such as the United Kingdom, Australia and New Zealand. Most of the empirical research conducted in the area of fixed asset revaluation has used data from these Anglo-Saxon countries to evaluate a number of hypotheses. These researches have mostly focused on the motives of carrying out asset revaluation.

Two suggestions have been forwarded in past literature as to why revaluation of fixed assets

occurs: political cost and debt contracting. According to the Positive Accounting Theory (PAT), it is argued that accounting numbers may be used as a means of providing 'excuses' for effecting wealth transfers in the political process (White et al., 1998). Previous research also provides evidence that upward asset revaluations are used by firms to avoid the cost associated with technical violation of debt covenant (Whittred and Chan, 1992; Brown, et al., 1992; and Cotter and Zimmer, 1995).

Watts and Zimmerman (1978), Wong (1988), and Deegan and Hallam (1991) reveal that the demands by particular interest groups may be affected by the results of the firm. Their studies demonstrated that high profits may be caused by an increase of taxes imposed by government and it could also be used as a reason for trade unions to demand a pay-rise. In such a case, upward revaluation of fixed assets may be used as a tactic to decrease the profit of the firm so as to improve the bargain power of the firm with government and trade unions.

Technical violation of accounting-based covenants could be costly. The technical violation of the debt covenants could bring adverse impacts to a firm, such as (1) increased interest rates, (2) more debt covenants imposed and (3) decreasing the amount the firm is eligible to borrow in future (Beneish and Press, 1995). Therefore, asset revaluation may be used as an accounting strategy to loosen constraints such as debt-to-equity restrictions. Management may have incentive to either inflate assets or deflate liabilities to avoid being in technical default of its debt agreement (Whittred and Zimmer, 1986; Christie, 1990).

In broad terms, the motives for practicing fixed asset revaluation can be divided into two categories: Management incentives and Market reactions. These two broad types of motives are explained in the next section.

2.2.1 Management Incentives

2.2.1.1 Major Studies on Management Incentives

A number of factors have been put forward in the empirical literature to explain managerial motives of doing a fixed asset revaluation. A summary of these empirical findings is shown in Table 2.1 below.

Table 2.1: A summary of empirical findings on management incentives for asset revaluation

Study	Country	Data Period	Evidence	
			Motivating Factors	**Non-Motivating Factors**
Whittred and Chan (1992)	Australia	1980-84	• Debt Covenants • Leverage • Investment Opportunities • Low Cash Reserves	
Brown et al. (1992)	Australia	1974-77; 1984-86	• High Leverage & covenant violation • Political Cost (Size) • Information Asymmetry; Signalling • Defence for takeover bid	
Cotter and Zimmer (1995)	Australia	1980-84	• Negative cash flows • Secured Borrowings	
Black, Sellers, and Manly (1998)	UK, Australia, New Zealand	1985-95	• Leverage • Book-to-equity ratios • Liquidity	
Gaeremynck and Veugelers (1999)	Belgium	1989-94	• Debt Covenants • Lower Net Worth	• Financial Assets
Cotter (1999)	Australia	1993-95	• Level of revaluations have gone down due to shift in debt market and legislature requirements	• Debt Covenants
Lin and Peasnell (2000a)	UK	1989; 1991	• Equity Depletion • Size and Leverage • Fixed Asset intensity	
Lin and Peasnell (2000b)	UK	1983	• Size and Leverage	
Jaggi and Tsui (2001)	Hong Kong	1991-95	• Signalling	• Debt Covenants
Missonier-Piera (2007)	Switzerland	1994; 1997; 2000; 2004	• Debt Covenants • Signalling • International Stakeholders	

One of the first research papers that discuss management's incentives for fixed asset revaluations is **Brown et al. (1992)**. The authors examine the revaluation decisions in Australia and their results show that larger firms which (a) report a high profit, or (b) face a takeover or likelihood of labour strike threat, will have greater incentives to undertake an upward revaluation of their assets.

Using a sample size of 204 and 206 firms listed on the Industrial Board of the Australian Associated Stock Exchanges for the period 1974-77 (higher inflation) and 1984-86 (lower inflation) respectively, Brown et al. (1992) explore a number of hypotheses related to fixed asset revaluation. The authors examine and evaluate a number of managerial motivations for asset revaluations including contracting costs, political costs, information asymmetry, financial slack, bonus issue, and defence against takeover. Since the revaluation of assets changes the accounting number of the firms, their study hypothesises that firms with higher debt to equity ratio are more likely to revalue their assets. Similarly, a firm having debt covenants is more likely to revalue than firms without such covenants. This hypothesis captures the contracting motivation of firm managers.

Brown et al. (1992) also examine political costs as a motivation for managers to undertake asset revaluations. The authors find that larger firms will revalue more frequently than smaller firms. The hypothesis stems from the fact that larger firms with huge profits are more likely to be noticed by regulators and pressure groups that might have the power to reallocate resources from such large firms. Huge profits/returns are usually associated with demands for higher taxes and/or other restrictions from these pressure groups (Watts and Zimmerman, 1978). Increasing assets would help firms to reduce the rate of returns. Ball and Foster (1982) regard the size as a noisy proxy for political costs and use industries prone to strikes as a further proxy for political costs and they find that firms in strike-prone industries are more likely to revalue their assets than firms in other industries. Industries prone to strikes are coal mining, waterfront, metal trades, and building and construction (Perry, 1979).

In a seminal paper Myers and Majluf (1984) find that firms can take up positive NPV projects in spite of information asymmetry if the firm has enough financial slack (cash, marketable securities, borrowing reserve). Financial slack such as borrowing reserve can be created through asset revaluation as it decreases debt equity ratio. Brown et al. (1992) find that firms, which have not undergone asset revaluation is more likely to revalue in the very near future. Since property values are more likely to be correlated with inflationary change, Brown et al.

(1992) find that firms are more likely to revalue property than plant and equipment. Furthermore, their results show that a firm is more likely to revalue when it has lower holding of cash and other marketable securities compared to total assets (so as to increase financial slack). Casey and Eddey (1986) argue that a common defence against takeover bid is to revalue assets and signal the true value of the firm to its shareholders. Using this argument, Brown et al. (1992) find that a firm with a threat of takeover is more likely to revalue its assets than firms without such threats.

Results from Brown et al.'s (1992) study show that firms with high leverage revalue more frequently than firms with low leverage. Similarly, firms closer to violating their debt covenants revalue more frequently than other firms. Supporting the political cost hypothesis, their results also show that larger firms revalue more frequently than smaller firms. Moreover, in the first period of 1974-1977, firms that were prone to strikes revalued more frequently than those in other industries, again confirming the political cost hypothesis. Thus, their results support the proposition that asset revaluation helps in lowering the probability of wealth transfers from contracting and political costs. Brown et al.'s (1992) study also support the information asymmetry and signalling hypothesis as evidence shows that firms with lower financial slack revalue more frequently than firms with higher financial slack. Asset revaluation as a defence for takeover bid also finds support in the evidence. The analysis shows that there are a number of motivations that drive asset revaluation and these motivations are different for different firms. The motivation for asset revaluation for a high leveraged firm is different for a low leveraged firm although both of them might be involved in asset revaluation.

Whittred and Chan (1992) also find evidence similar to Brown et al. (1992). They use a sample of 428 Australian firms (129 revalued firms and 299 non-revalue firm) during the period 1980-84. The authors argue that the problem of underinvestment, as discussed by Myers and Majluf (1984), can be solved in an inexpensive manner through asset revaluations. The problem of underinvestment is exacerbated by covenants based on accounting numbers since certain covenants restrict the firm from making further borrowings and therefore rejecting positive NPV projects (Courtenay and Cahan, 2004). Whittred and Chan, (1992) argue that while additional borrowings can be made through negotiations with the bank, a less costly approach would be to revalue the assets as it would avoid going through the pain of negotiations. The underinvestment problem can be alleviated this way with the relaxation

of debt covenants.

Results from Whittred and Chan's (1992) data show that there is a strong relationship between revaluation of assets and the existence of debt covenants, leverage, investment opportunities available and cash reserves. The authors find that revaluation is carried out by Australian firms to increase their borrowing capacity so as to invest in positive NPV projects, thereby alleviating any underinvestment problem.

Gaeremynck and Veugelers (1999) create a theoretical model of asset revaluation and present some empirical evidence from Belgium regarding managerial motivations on asset revaluations. Using an analytical model, the authors examine the signalling motivation of managers in an environment where the probability of raising funds not only depends on the expected future prospects of its projects but also on its existing financial position. Revaluation decreases the expected costs of reorganisation since a decision not to revalue may increase the leverage of a firm (debt to asset or equity ratio) leading to violations of its debt covenants. However, the decision not to revalue its assets increases the probability of receiving additional funds because it signals it will be more successful (without resorting to revaluation). The authors show that a separating equilibrium can be achieved only when successful firms do not revalue because the expected cost of reorganisation is smaller than the additional benefits received from additional funding. Gaeremynck and Veugelers (1999), however, contend that such strategy is not favourable in all circumstances. The strategy that is most favourable is those industries which are characterised by high variance in performance and low equity to debt ratio.

Gaeremynck and Veugelers (1999) use empirical data comprises 1,036 observations (189 revaluations and 847 non-revaluations) selected from those firms that were not listed on the Belgian Stock Exchange during the 1989-94 period. They find that, as a credible signal of the firm quality, successful firms in industries characterised by high performance variance and low equity to debt ratio, avoid revaluing their assets. Their results also show that the amount of revaluation (i.e. Revalued amount as a percentage of capital) does not affect the decision to revalue or not. Supporting the evidence of earlier studies, the authors also find evidence of firms being engaged in revaluation when they are close to violating debt covenants and when their net worth becomes lower. Their results also provide evidence that revaluation of financial assets does not provide any information on future cash flows.

Cotter and Zimmer (1995) examine some of the issues that were not explored by earlier researchers. The authors are concerned with the large number of independent revaluations carried out by firms where there are no restrictions. Furthermore, while independent revaluations are required in order to make the balance sheet more attractive, the widespread use of directors' revaluation in financial statements also made the authors think about the motivation of such revaluations. The authors also question leverage as the only criteria for receiving additional funds and determining the borrowing capacity of firms. They posit that borrowing capacity also depends on lenders' assessment of the firm's ability to repay debt. In addition, the authors state that it is the cash flow from operations rather than the cash flow from investing and financing that affects the borrowing capacity of firms. In view of all these issues Cotter and Zimmer (1995) posit a number of hypotheses: (a) firms undertaking a revaluation are more likely to experience declining cash flow from operations than other firms; (b) the relation between cash flow from operations and asset revaluation is stronger when the firm is highly leveraged; (c) firms undertaking a revaluation are more likely to increase their levels of secured borrowings than firms that do not revalue; (d) revaluations made by directors are more likely to be recorded in the accounts at financial year end than at other times of the year; and (e) revaluations recorded in the accounts at dates other than financial year end are more likely to be made by independent valuers.

Cotter and Zimmer (1995) use 100 firms from Whittred and Chan's (1992) study. Their study find support for most of the hypotheses. The authors' results support the hypothesis that firms undertaking revaluation are more likely to experience negative cash flows than firms which did not revalue. The revaluation is most likely to occur in the year of decreasing cash flow while firms experiencing increase in cash flow do not revalue. Moreover, this relationship is even stronger in case of firms with high leverage. Evidence also shows that an increase in secured borrowing is accompanied by asset revaluations. With respect to the source of revaluation, evidence suggests most of the directors' revaluations are recorded at the end of the year while most non year-end revaluations come directly from contracting with lenders which require independent valuation.

Black, Sellers, and Manly (1998) extend the evidence on asset revaluation in the context of the UK, Australia, and New Zealand. The authors also examine whether firms are engaged in earnings management through sale of revalued fixed assets. Using a sample of 696 firm-year observations from the UK and 503 firm-year observations from a combined sample for

Australia and New Zealand (ANZ) during the period 1985-1995, the authors examine whether revaluers and non-revaluers differ in terms of debt equity ratios, market-to-book ratios or liquidity ratios. The result suggests that revaluers are larger and have more market capitalisation than non-revaluers, at least in ANZ. Consistent with prior work, evidence from the analysis of the data suggests that both in the UK and ANZ revaluers are much different to non-revaluers in terms of leverage, book-to-equity ratios and liquidity. While the leverage of revaluers is much higher than non-revaluers, the liquidity is much lower. The authors' result did not show any evidence of income smoothing behaviour by firms through the sale of revalued assets. Sales of revalued assets occur primarily because of sound investment and production reasons.

Cotter (1999), using a sample of Australian firms, presents recent evidence on the motivations of asset revaluations. The author argues that in spite of earlier evidence available on motivations of asset revaluation it is necessary to provide fresh evidence on account of a number of changes in institutional settings. The author points to increased regulation of asset revaluation and disclosures, changes in microenvironment and changes in the Australian debt market as justification to provide fresh evidence on asset revaluation motivations. Primarily Cotter (1999) strives to find out whether debt contractions motivations still remain strong for asset revaluations in the changed environment.

Cotter uses a sample of 485 firm-years consisting of 171 firms listed on the Australian Stock Exchange during the 1993-1995 periods. The data suggests that most of the revaluations are for land and buildings while about 14 percent of the revaluation comprises that of plant and equipment and investments. A number of revaluations were not made in the accounting books but disclosed in the footnotes. In regards to source of valuation, almost half of them come from independent valuers while the remainder come from a combination of directors and independent valuers and directors' revaluation. The increase in valuation, however, represents only a small percentage of the total assets and therefore does not make a significant improvement in the debt equity ratios. More importantly, the data suggests that a smaller number of firms engaged in revaluation in the 1990s compared to the 1980s. In addition, the increment in value is not significant. While Whittred and Chan's (1992) sample shows a mean of about 7.73 percent increase in asset value through revaluation, the mean increase in Cotter 's (1999) sample is only 4.7 percent.

The data analysis suggests that motivation to increase the borrowing capacity or the proximity of violating debt covenants is no longer related to asset revaluations. The significant change during the period is the shift in the way firms fund themselves: moving from public to private debt and with strong relationship with banks. The author states that the need for revaluation has decreased with the dramatic increased in private debt through closer relationships with banks. Instead of carrying out an asset revaluation most firms disclose through footnotes, which also is less costly compared to revaluation done by independent valuers. The results received additional support from the series of interviews that the author conducts with chief financial officers of a number of firms. Besides the shift in debt source, lower inflation and changes in legislation requiring the firms to obtain asset revaluation every three years are also reasons the author advances for the decline in asset revaluation by firms. The result is quite a departure from earlier studies and calls for new evidence from all countries where asset revaluation is permitted in the books of account.

Using large samples from 1989 and 1991 of firms listed on the London Stock Exchange, **Lin and Peasnell (2000a)** examine the relationship between contracting, signalling, and political environments and asset revaluation. They examine whether asset revaluation is used to fill 'equity depletion' brought about by implementation of the UK accounting method, which requires firms to write off goodwill purchases to equity reserves. The selection of the two years (1989 and 1991) helps the authors to examine whether firms store undisclosed revaluation reserves during periods of economic boom (1989) and report them during periods of economic downturn (1991). The authors use a sample of 1,106 firms for 1989 and 1,083 firms for 1991.

Lin and Peasnell's results suggest that equity depletion is strongly related to asset revaluation. Furthermore, asset revaluation is also positively related to size, gearing and fixed asset intensity of the firm while negatively related to liquidity. The authors' result support the contracting hypothesis and show that equity depletion, quick assets and size are important factors in determining when a particular firm revalues its assets.

Using a costly contracting framework, **Lin and Peasnell (2000b)** examine asset revaluation and Current Cost Accounting (CCA) disclosure decisions of UK firms in 1983. As a result of high inflation in the early 1970s and demand for a current value or constant price accounting system, the Current Cost Accounting standard (SSAP 16) was introduced in 1980 in the UK.

The standard was suspended in 1985 and withdrawn in 1988 making it a purely voluntary exercise for firms thereafter. The authors use this period (when the standard was introduced) to examine, apart from factors affecting revaluation of assets, whether asset revaluation and CCA were part of the same coin to meet the same end. In line with results from earlier studies, the authors use a sample of 474 firms included in the Financial Times Actuaries All Share (FTA) index in 1983, find evidence of asset revaluation positively related to size and gearing. The authors attribute this relationship to political cost and debt contracting motivations of managers. However, their results did not find any evidence of the connection between asset revaluation and compliance with CCA standards. That is, they are not the means to achieve the same goals.

Jaggi and Tsui (2001) provide evidence of managers' motivation for upward asset revaluation from Hong Kong. The study uses a sample of 481 firm-year observation during the period 1991-95 drawn from the EXTEL database of Financial Times Information. The authors result show that the most important motivation for asset revaluation is the signalling of the fair value of the asset to investors. This comes from the strong positive relationship between revaluation and future operating income. Their results also reveal the alignment of the investors' and managers' assessment of asset values. They, however, fail to find evidence for one of the main motivations that has been described in the literature: debt covenant violation. However, they did find evidence of asset revaluation related to managers' increase borrowing capacity. Their results show a relationship between share price increase and asset revaluation. They also present evidence in a setting where firms are mostly owned and controlled by family and indicate that revaluation is considered value relevant by the investors.

Missonier-Piera (2007) presents evidence of economic motivations for asset revaluations of Swiss managers. Investigation of asset revaluation in Switzerland becomes interesting for a number of reasons: firms in Switzerland use international accounting standards; international stakeholders are important to Swiss firms as a number of Swiss firms rely on international investors and customers and therefore provides the opportunity to examine the influence of international stakeholders on the choice of accounting treatment; and the Swiss stock exchange is relatively illiquid and resembles more of a bank oriented market. Missonier-Piera postulates a number of hypotheses on upward asset revaluation related to debt costs, needs of international stakeholders, managers' compensation, leverage ratio, level of export sales, and

ownership diffusion (control). In order to capture the significant accounting changes, the author utilises data of year 1994, 1997, 2000, and 2004.

Using pooled and cross regression analysis, the author finds firms conducting asset revaluation with more leverage and fewer investment opportunities. Reducing the likelihood of violating debt covenants and signalling the increased borrowing capacity seems to be the primary motivation of Swiss managers to revalue their assets. Missonier-Piera also finds evidence of export sales with revaluation of assets with the manager's assumption of increased creditworthiness as important for foreign stakeholders.

2.2.1.2 Conclusion on Management Incentives

The discussion of the above studies reveals that a number of factors have been put forward by researchers to explain the motivation of managers to undertake upward fixed asset revaluations. The major factors that affect revaluation can be summarised as: leverage, increased borrowing capacity, debt covenants, declining operating cash flows, size and strike prone industries, low liquidity, depletion of equity, growth prospects, defence against takeover bid. However, not all factors are important at one point in time or for all firms. While some factors might be more important for some firms than others, the same factors again might not be important at other times. Cotter's (1999) study lends support to the argument that even though some factors have remained influential over time, a number of other factors which were considered important during the 1970s and 1980s are no longer important. It therefore becomes important to re-examine these factors in the light of recent data and new standards and regulations to bring to light the most important factors affecting asset revaluation.

2.2.2 Market Reactions

2.2.2.1 Market Reactions to Asset Revaluation

Asset revaluation will affect accounting numbers, which in turn alters financial statements. If asset revaluation information is useful for investors' decision-making, one would expect to see a relationship between asset revaluation and share prices. Previous studies (Sharpe and Walker, 1975; Standish and Ung, 1982; Emanuel, 1989 and Easton et al., 1993) showed mix results regarding the impact of revaluations on share prices.

A number of research papers have investigated the impact of upward fixed asset revaluation by examining the relationship between asset revaluation and movements in the share price. A summary of the studies is presented in Table 2.2.

Table 2.2: A summary of empirical findings on market reactions to asset revaluation

Study	Country	Data Period	Evidence
Sharpe and Walker (1975)	Australia	1960-70	• Revaluation announcements being regarded as informative by the investors and that such information is quickly absorbed into the security prices
Standish and Ung (1982)	UK	1964-73	• Positive unexpected returns for firms which announced fixed asset revaluation • Fixed asset revaluations are taken by the market as pointers to some other benefits to the shareholders
Emanuel (1989)	NZ	1970-79	• Results fail to show any relationship between asset revaluations and revisions in share prices • Asset revaluation as a pure accounting artefact.
Easton, Eddey, and Harris, (1993)	Australia	1981-91	• Strong relationship between stock price returns and revaluation for firms with high debt equity ratio
Bernard (1993)	Australia	1981-1999	• A re-examination, confirmation and discussion of Easton et al. (1993) • Puts forward the efficient contracting hypothesis
Barth and Clinch (1998)	Australia	1991-95	• Revaluation of operational assets, such as PPE, are more value relevant than those assets which are not directly related to operations
Aboody, Barth, and Kasznik (1999)	UK	1983-95	• Strong positive relationship between asset revaluation and future performance one, two and three years after the revaluation • Weak relationship between asset revaluation and share price and future performance for firms with high debt to equity ratios
O'Hanlon,and Pope (1999)	UK	1972-1992	• Only value relevant flow is the ordinary profit
Cahan, Courtenay, Gronnewoller & Upton, (2000)	NZ	1992-97	• Only the comprehensive income having any relevance to value and that there is no value addition from segregating the components of income
Courtenay and Cahan (2004)	NZ	1992-96	• Asset revaluations are significantly and positively related to stock returns • Firms having higher levels of debt do not experience stock price appreciation as firms having lower debt do

One of the earliest studies on asset revaluation is by **Sharpe and Walker (1975)**. Sharpe and Walker's (1975) study provides some evidence of changes in accounting method (asset revaluation), which are associated with shifts in stock prices. Their study utilises a sample of 35 revaluation announcements of Australian firms during the period 1960-1970. They find evidence of revaluation announcements as being regarded as informative by the investors and that such information is quickly absorbed into the security prices. They did not find any evidence of such revaluation announcements being associated with systematic changes in the volatility of stock's return relative to the market. The validity of Sharpe and Walker's (1975) study was later questioned by Brown and Finn (1980) on the basis that in about 75 percent of the cases were other announcements such as increased earnings, dividends and stock dividends.

Using data during the period 1964-1973, **Standish and Ung (1982)** evaluate the market reaction to asset revaluation in the UK prior to the pronouncement of the UK GAAP for asset revaluation. Standish and Ung (1982) use the Capital Asset Pricing model (CAPM) in analysing data from 232 listed British firms. Their results show that, on average, there are positive unexpected returns for firms which announced fixed asset revaluation. In order to separate out the effects of announcement of fixed asset revaluation with other announcements, Standish and Ung (1982) segregate the sample into sub-samples. Analysis of the sub-samples indicates that fixed asset revaluations are taken by the market as pointers to some other benefits to the shareholders. When those favourable benefits occur, there will be significant improvements in stock return. However, when those expected favourable benefits do not occur, then there is an absence of unexpected returns. The authors argue that revaluations are used by the managers as tools to influence the capital market expectations about their firms.

Emanuel (1989) provides evidence of the impact of material fixed asset revaluation on the share price. Emanuel uses 143 material asset revaluations during the period 1970-1979. The author notes that asset revaluation is a common practice in New Zealand as almost 90 percent of the firms listed on the stock exchange carry out revaluations at some time or the other. The results fail to show any relationship between asset revaluations and

revisions in share prices. While there is some price reaction exactly at the time of announcement (time zero), the author finds it difficult to attribute it to asset revaluation as there could be a range of other factors that could have impacted the share price with the publication of annual report (asset revaluations are normally shown in annual reports). The further the data was tested the more difficult it became to attribute any price increase to asset revaluations. The author regards asset revaluation as a pure accounting artefact.

Easton et al. (1993) examine the impact of asset revaluation on shares. The authors use a number of tools including a survey of chief financial officers and a test of association between hand collected data and stock returns to evaluate the impact of noncurrent asset revaluation. Their analysis is carried out on Australian data spanning a ten year period (1981-1991). Their sample of firms consists of 72 industrial firms and 28 mining firms. A telephone survey was conducted with the chief financial officers of 59 industrial and 21 mining firms. The findings from the survey reveal that the most important reason for asset revaluation was to lower the debt equity ratio. Results from the analysis of price to book models and return models show weak explanatory power of fixed asset revaluation for returns over income and changes in income. They, however, find strong relationship between stock price returns and revaluation for firms with high debt equity ratio. The authors argue that revalued book value of assets is more aligned with the market value of the firm than in firms without such revaluations. In a discussion paper by Easton et al. (1993), Bernard (1993) puts forward the efficient contracting hypothesis where revaluations may be used to justify increased borrowing and therefore benefit the firm as well as the lender.

Aboody et al. (1999) present a comprehensive analysis of the impact of upward asset revaluation on future performance of the United Kingdom (UK). Using data on more than 5,000 firms during the period 1983-1995, the authors show that revaluation of noncurrent assets is common in the UK as 58.9% of the firms during the period have a non-zero revaluation balance. The authors argue that the relationship between asset revaluation and share price returns only provides indirect evidence of value relevance of asset revaluation as share price returns are also influenced by the firm's financing and investment decisions.

They regard the evidence of the relation between asset revaluation and future firm performance in terms of operating income and cash flow from operations as direct evidence of the value-relevance of asset revaluation.

Controlling for current changes in performance, risk and growth, Aboody et al. (1999) find strong positive relationship between asset revaluation and future performance one, two, and three year after the revaluation. The authors' results show some relation between asset revaluation and share price performance. Moreover, current year revaluations are positively related with share price performance. However, they find weaker relationship between asset revaluation and share price and future performance for firms with high debt to equity ratios than for firms with low debt equity ratios. The authors argue that the market participants regard upward revaluations as high debt equity firms as being opportunistic, therefore the negative relationship between the two variables. This is in contrast to the evidence found by Easton et al. (1993) whereby the relationship is found only in cases of firms having high debt equity ratios. Aboody et al. (1999) does not find strong relationship between revaluation and future performance/share price returns in case of cross listed firms. The authors, however, find strong relationship between revaluation and future performance/stock returns in periods of consistently increasing asset values rather than in periods of economic volatility.

Using 810 firm-year observations during the period 1991-1995, **Barth and Clinch (1998)** investigate the extent to which different types of revalued assets are associated with share price and non-market based estimate of the firm value in Australian firms. Specifically they examine whether relevance, reliability, and timeliness of revalued assets vary systematically across asset class or by source or age of the revalued amount. The authors result show evidence of value relevance with variations in results in terms of asset types. Their results also show that revaluation of operational assets, such as PPE, are more value relevant than those assets which are not directly related to operations. There does not seem to be any evidence of difference in investors' attitudes towards valuation made by independent appraisers and those made by directors of the firm. Furthermore, their results show that timeliness of valuation for long term assets is not critical.

Using 20 years data from 1972-1992 of UK firms, **O'Hanlon and Pope (1999)** find that the only value relevant flow is the ordinary profit. Cahan, Courtenay, Gronnewoller, and Upton (2000) argue that one of the reasons for the conflicting results is probably due to the use of an aggregate measure of asset revaluation instead of segregating the asset revaluation as in the case of Barth and Clinch (1998).

Cahan et al.'s (2000) study shows evidence consistent with Aboody et al. (1999) and Barth and Clinch's (1998) findings. Using data from 48 firms, Cahan et al. (2000) examine the value relevance of fixed asset revaluations. Their study shows that comprehensive income to be more value relevant than net income. Using an approach adopted from Stark (1997), they find only the comprehensive income having any relevance to value and that there is no value addition from segregating the components of income. Their study is an extension of the work of O'Hanlon and Pope (1999), who did not find any evidence of value relevance of asset revaluation.

Courtenay and Cahan (2004) provide further evidence from New Zealand using 235 firm-year observations from a sample of 48 firms listed on the New Zealand Stock Exchange over the period 1992-1996. Their study primarily investigates the differential reaction of investors to asset revaluations for firms with different debt equity ratios in order to identify whether such revaluations are motivated by opportunism (see Brown et al., 1992) or contracting/signalling (see Whittred and Chan, 1992).

Courtenay and Cahan's (2004) results show that asset revaluations are significantly and positively related to stock returns. Their results also show a negative relationship between asset revaluations and the level of debt in a firm. Firms having higher levels of debt do not experience stock price appreciation as much as firms having lower levels of debt from asset revaluations. This shows that the market discounts information about fixed asset revaluation comes from firms with high leverage. Their results also show similar relationship when leverage is replaced by financial distress. They attribute this result to the opportunistic behaviour of asset revaluation (Aboody et al., 1999). They cautiously note the negative relationship between revaluations of intangible assets and share price

returns. Owing to a small sample size, they refrain from making conclusions and suggest it as an area for further research.

2.2.2.2 Conclusion on Market Reaction

The above studies of market reaction on asset revaluation do not provide a unanimous conclusion. We cannot confidently conclude that that upward revaluation of fixed asset will bring about positive change in market prices. We therefore cannot ascertain that asset revaluation information is perceived as value relevant by current and potential investors. Seemingly, the market's reaction depends on a number of factors including leverage and the asset being revalued among others. Table 2.2 shows most of the studies were done in the early 1990s. Again, there is not much current research evidence on this pertinent issue. As discussed earlier, there are about 48 countries which allow asset revaluation. Due to significant differences in the legal, ownership and structural framework of these different countries, results obtained in one of these countries cannot be generalised easily. Nonetheless, studies exploring the impact of asset revaluation on share prices from these different countries would contribute significantly to the ongoing debate and to current accounting literature.

It is worth noting that accounting regulation has changed significantly in the last two decades. The birth of the European Union and the adoption of the IASB's International Financial Reporting standards are amongst the biggest changes in this area. With a change in the legal framework governing the issue - asset revaluations, the institution of regulations to improve the quality of reporting, higher information availability brought about by the growth in information technology, there is need for a current review of this issue.

CHAPTER 3
METHODOLOGY AND DATA

This research adopts the method used in Lin and Peasnell's (2000a) and Sharpe and Walker's (1975) studies. We made some adjustments to the method. For example, only five explanatory variables (instead of six variables used in Lin and Peasnell's (2000a) study) are used in this study. The relationship between the five explanatory variables and the fixed asset revaluation decision of the NZ firms are investigated in this study, using Lin and Peasnell's (2000a) model. The research data is collected via DataStream and annual reports of NZ listed firms. Following Sharpe and Walker (1975), this study only considered fixed assets revaluation in the firms. A supplementary test is performed to examine the relationship between asset revaluation and the market reaction.

This section consists of four sections: (1) the revaluation profile of NZ firms; (2) the factors that influence the revaluation decisions; (3) the samples and variables; and (4) the Empirical Model.

3.1 Revaluation Profile of Studied Firms

In New Zealand, firms have the option to choose whether to revalue or not to revalue their fixed assets. If the firms choose to revalue, they are subject to SSAP 28 or FRS 3, which curtails their freedom to time revaluation in the subsequent years. However, given the restricted time frame of 3 or 5 years, firms could still choose when to exercise the option of revaluation when it will yield greater benefits (Cotter and Zimmer, 1995). Similarly, a firm can choose to revalue or not to revalue its fixed assets. Firms could be classified as regular revaluers, occasional revaluers, and non-revaluers, as identified in

Lin and Peasnell's (2000a) study. The regular revaluers are represented by firms that present little or inexistent option of deferring revaluation, firms that make out of regular revaluation on their current policy. Occasional revaluers are represented by firms that did not revalue during the period under analysis, but did so in the previous year. On the other hand, non-revaluers are firms that that did not revalue in the studied year and previous year.

3.2 Factors that Influence Revaluation

From the various revaluation factors that constituted in the discussion of previous studies on fixed asset revaluation, this study focuses on five factors as follows:

3.2.1 Gearing

Gearing, or financial leverage, represents the fundamental analysis ratio of a firm's long term debt to its equity capital. Gearing is directly related to the debt: equity ratio. The higher the debt: equity ratio, the higher the level of gearing (Westwood, 1995). This study considers the various reasons for which gearing can be an important factor in the decision a certain firm will make whether to revalue or not to revalue its fixed assets.

3.2.2 Liquidity

Liquidity represents the capacity of an asset to be rapidly sold or transform into cash (Petty, Keown, Scott, and Martin, 1993). As a proxy for a firm's liquidity, the quick asset ratio will be used in this study for a better comprehension and the analysis of the influence liquidity has on the revaluation decision. Also known as "acid test ratio", the quick asset ratio results from the subtraction of inventories from current assets and then divided by current liabilities. The quick asset ratio can be viewed as an indicator of a firm's financial strength or weakness. Depending on

the level of liquidity, a firm might decide not to revalue its fixed assets. This is because revaluation can offer relief by giving more updated information on the amount of cash that would be possible to obtain from the selling of assets, and thus improving the borrowing capacity of the firm.

3.2.3 Market-to-book Ratio

The market-to-book ratio can be considered as a signal of possible growth options. Debt contracting cannot be assured without a reasonably high proportion of tangible assets in the balance sheet. Consequently, a high market-to-book ratio is desired for the successful completion of the above mentioned operation, and thus, in the case of perceived under-valuation (as indicated by the market-to-book ratio) the incentive to upward revaluation will be significantly high (Whittred and Chan, 1992; Lin and Peasnell, 2000a).

3.2.4 Firm Size

There are various items regarding the size of a firm that could influence the decision on revaluating fixed assets. One of them is, the possibly of higher incentives that large firms will have – when comparing with smaller ones – to try to offer a conservative image on their profitability, due to the higher media and government exposure these firms attract (Lin and Peasnell, 2000a).

Similarly, the costs involved in the process of revaluation are different from small firms to large firms. A critical analysis on how this kind of situations can affect the decision of large and small firms to revaluate their assets will be analysed in this study too.

3.2.5 Fixed Asset Intensity

The generation of significantly different numbers in the revaluation process is conditioned by the stock of fixed assets retained by the chosen firm. The larger the stocks of fixed assets in comparison to total assets, the higher the potential for revaluation to report a reduced profitability. Depending on a firm's interest, a decision whether to revalue or not to revalue its assets will be taken into consideration (Lin and Peasnell, 2000a).

3.3 Samples and Variables

3.3.1 Management Incentives (Research Questions 1 to 5)

For research questions 1 to 5, the dependant variable is fixed asset revaluation and the independent variables are gearing, liquidity, market-to-book ratio, firm size, and fixed asset intensity. The firms are drawn from the population of New Zealand firms active in industrial and commercial branches that traded shares on New Zealand Stock Exchange in 1998 and 2005. By late 2007, New Zealand has had enjoyed its nine years of uninterrupted economic growth since its last recession in 1998. It was the longest recession-free period since the sustained boom of 1952-1966 (Oram, 2007). Thus, by focusing both 1998 and 2005 it is possible to capture two contrasting sets of economic conditions in New Zealand. Depending on whether a fixed asset revaluation took place, the firms selected have been categorised into two groups, revaluers and non-revaluers.

All data are available in the DataStream NZQI including the firms' annual reports. Data for revaluation firms have been obtained from New Zealand Exchange (NZX). The data for research questions 1 to 5 excludes banks, financial institutions, investment trusts and property institutions for the reason of either (1) the firms are operating differently from ordinary industrial and commercial firms, or (2) the firms do not have many tangible assets in their businesses. Additionally, oil and gas and utilities firms are also excluded from the studied sample, because the former use specific accounting measurement

methods and the latter operate in highly regulated environments, which are significantly different from those of ordinary industrial and commercial firms. Thus, incentives for fixed asset revaluations may not apply to those firms.

The accounting variables are derived from reported results of the analysed year (e.g. for firms that use a March financial year-end, the results from 2005 will be extracted from the data available for the year ending in March 2005).

Following Lin and Peasnell (2000a), sample firms will be divided into four groups to answer research questions 1 to 5. These include:

REV group → represents firms that revalued upwards their fixed assets in the analysed year;

PRREV group → represents firms that did not revalue their fixed assets in the analysed year, but revalued it in the previous two years;

NONREV group → represents firms that did not revalue their fixed assets in either the analysed year or in the previous two years;

DOWN group → represents firms that wrote down their fixed assets during the analysed year.

The reasons in subdividing non-revaluers includes: (1) those previously revalued but not revalued in the studied year (PRREV) and (2) those did not revalue in the previous two years and the studied year (NONREV) are to address the *choice* and *timing* issues. The above partition of the firms reflects the discretionary nature of (upward) revaluations.

Firms might have the option and not the obligation to do revaluation. The revaluation can be considered discretionary from two points of view: first, firms have a choice of whether or not to revalue. When and if the first choice is made, the question of the timing follows: when will the firm revalue? Therefore, depending on the focus we choose, for example, if we consider the choice (revalue or not revalue), we can group PRREV and REV; if we decide on the issue of timing (revalue now or revalue in the future), PRREV will be grouped with NONREV. Both of these options are addressed in our study, while the issue of devaluation, which is not discretionary, will be treated separately (see Lin and Peasnell, 2000a). Table 3.1 provides a summary of the measurement of the independent variables and dependent variable for research questions 1 to 5.

Table 3.1: Measurement of variables for research questions 1 to 5

Variable	Measured as
***Independent Variables*:**	
- Gearing	Total debts/Total equity
- Liquidity	Quick assets/ Current liabilities
- Market-to-book ratio	(Market value of equity + Book value of debt) / Book value of equity and debt
- Firm size	Logarithm of sales
- Fixed asset intensity	Net fixed assets/Total assets
***Dependent Variable*:**	
- Fixed asset revaluation	Log-odds of revaluation

3.3.2 Market Reaction (Research Question 6)

For research question 6, the two variables of interest are 'fixed asset revaluation' and 'share price movement'. Following Sharpe and Walker (1975), all cases must have increased the value of shareholder equity by at least 10% through revaluation. The initial sample under investigation constitutes all listed firms on the New Zealand Stock Exchange between 2001 and 2005 inclusive. However, some cases are finally excluded due to data unavailability.

This study period is recent and excludes 'noise' that may have been caused by the global financial crisis that started in July 2007. Noise in this case constitutes other factors in the

external environment (not controlled by the firms in the sample) that may have caused significant movements in share prices. This may include falling global demand, rising oil prices, falling house prices, falling production, the collapse of major financial corporations, etc.

New Zealand adopted the IFRS in 2005. The IFRS introduced new principles to govern fixed asset revaluation and thus our conclusion will lack robustness if we exclude 2005 from our analysis.

We obtained our data from DataStream NZQI and the firms' annual reports. In some cases, we cross checked the data obtained from these sources by cross referencing it with information available on the firms' websites and in the financial press. From the firms' annual reports, we obtained the firm names, revaluation amounts and year of revaluation. We use DataStream to obtain the exact month of revaluation. Following this, we extract information on adjusted monthly share prices (price index) for 12 months before this date, the event date and 12 months after this date.

Price index is used in our study since it is adjusted for other price sensitive information, such as dividends, earnings, share splits and inflation. The noise that results from other price sensitive information constituted one of the major weaknesses of the Sharpe and Walker's (1975) study.

Data for revaluing firms are obtained from the New Zealand Exchange (NZX). Following Sharpe and Walker's (1975) study, the data set contains only firms that announced material asset revaluations i.e. at least 10% to shareholders' fund (shareholders' equity).

3.4 Empirical Model

3.4.1 Management Incentives (Research Questions 1 to 5)

Following Lin and Peasnell (2000a), this study uses logistic regression to examine the five factors (independent variables) influencing the revaluation decisions of a sample of New Zealand firms in 1998 and 2005.

The empirical analysis for research questions 1 to 5 are structured as follows:

- Model 1 = comparison between REV and NONREV
- Model 2= comparison between REV and (PRREV+NONREV)
- Model 3= comparison between (REV+PRREV) and NONREV
- Model 4= comparison between DOWN and (PRREV+NONREV)

Logistic regression analysis has been used as opposed to ordinary least square regression analysis because the dependent variable (the decision to revalue or devalue assets in the current year) is binary. In each year, the decision of firms to revalue fixed assets can be considered as a choice problem where firms must make their selection from the two alternatives available (Lin and Peasnell, 2000a). Fixed asset revaluation (dependent variable) can assume only two values – a revaluation of fixed assets (1) or no revaluation of fixed assets (0). As opposed to ordinary least square regression which estimates its coefficients via a least squares method, logistic regression estimates its coefficients through maximum likelihood method (Anderson, Sweeney, Williams, Freeman, and Shoesmith, 2007). The dependent variable for each of the above models is the log-odds of revaluations. The regression model is defined as follows:

$y_i^* = \beta' \chi_i + u_i$ ($i = 1, 2, \ldots, n$) (1)

where y_i^* = underlying latent variable

y_i = 1 if $y_i^* > 0$, and $y_i = 0$ if $y_i^* < 0$

χ_i = a vector of explanatory variables

u_i = an i. i. d. random variable with mean 0

i = firm

The response variable y_i^* reflects the utility of revaluation for firm i, which if positive, will result in a revaluation (Lin and Peasnell, 2000a, p381). The vector χ_i includes an intercept indicator variable, of which a significant positive (or negative) intercept would imply that firms have a bias in favour of (against) revaluation (Griffiths, Hill, and Judge, 1993).

Following Lin and Peasnell (2000a), three separate binomial logit models of upward revaluation will be fitted in 1998 and 2005 to reflect different ways of classifying the previous revaluers who did not revalue during the studied year (PRREV). Hence, PRREV will not be included in Model 1 and will be classified with the non-revaluers in Model 2. In Model 3, PRREV will be classified with the current revaluers (Lin and Peasnell, 2000a).

The standard logistic regression equation to be analysed is given below:

(2)

$$\overline{Y_i} = \frac{e^{A+B_1X_1+B_2X_2+B_3X_{3+}B_4X_4+B_5X_5}}{1+e^{A+B_1X_1+B_2X_2+B_3X_3+B_4X_4+B_5X_5}}$$

where A is a constant and B_1, B_2, B_3, B_4, B_5 are the coefficient of the independent variables i.e. Gearing, Liquidity, Market-to-book ratio, Firm Size and Fixed Asset Intensity respectively.

The independent variables, gearing, liquidity, market to book ratio, firm size, and intensity are computed as shown in Table 3.1. There exists a relationship between Y (the dependent variable) and Xi (the independent variable) if the coefficient of Xi, Bi, is different from zero. The hypothesis to test the models for significance is given as follows:

Ho: $B_1 = B_2 = B_3 = B_4 = B_5 = 0$

H1: $B_1 = B_2 = B_3 = B_4 = B_5 \neq 0$

The relationship will be significant only if *B*i is found to be statistically significantly different from zero.

3.4.1.1 Obtaining Values for the Dependent Variable

The dependent variable, Y, in our study, models the firm's decision to revalue fixed assets. The firm can do one of the following:

- ✓ Revalued fixed assets in the analysed year
- ✓ Devalued fixed assets in the analysed year
- ✓ Revalued fixed assets in any of the ensuing two years but not the analysed year
- ✓ Not revalue fixed assets in any of the three years

For example, Model 1 compares firms that revalued their fixed assets in the year under investigation (1998, 2005) with firms that did not. This comparison is obtained with the dependent variables 1 and 0 to indicated REV and NONREV respectively. The same analysis is used to structure the other two models. A summary of the models is given in Table 3.2 below:

Table 3.2: The structuring of Model 1 to Model 4 for 1998 and 2005

Model		Dummy variable used (log-odds of revaluation)		Dummy variable used (log-odds of revaluation)
Model 1	REV	1	NONREV	0
Model 2	REV	1	PRREV & NONREV	0
Model 3	REV & PRREV	1	NONREV	0
Model 4	DOWN	1	PRREV & NONREV	0

3.4.1.2 Measures and Tests: Goodness of Fit, Tests for Significance and Strength of Association

3.4.1.2.1 Chi Squared

In this study, the chi squared (also called the -2Log Likelihood) measure will be used to measure goodness of fit of both the coefficients and the models. Chi squared is influenced by the sample size. With large sample sizes, even a small difference in the -2log likelihood of models might be very significant (Anderson et al., 2007, p407).

The goodness of fit test (chi squared) focuses on the difference between observed frequencies and expected frequencies under the assumption that the null hypothesis is true (Anderson et al., 2007, p407). The aim is to determine if the difference between observed values and expected values is large enough for us to reject the null hypothesis. The chi squared distribution is given as follows:

(3)

$$\sum_{i=1}^{k} \left(\frac{X_i - \mu_i}{\sigma_i} \right)^2$$

In this study, we use the likelihood ratio chi squared test to test the null hypothesis that the coefficients of all independent variables in our model are equal to zero. If we reject this hypothesis, we would conclude that there is a statistically significant relationship between the dependent and independent variables used in the model.

The model chi squared is computed by simply contrasting a model with a constant only versus a model with all the independent variables. A value that is significant indicates that one or more of the betas (coefficients of independent variables) are different from zero but the chi squared measure falls short as it does not indicate which betas are significant (Anderson et al., 2007). This computation is efficiently done in this study by using the SPSS statistical software.

3.4.1.2.2 R Squared

R squared is a useful measure of fit in statistical modelling. In their study, Shtatland, Moore, and Barton (2000) comment that the use of R squared might be prevalent because it takes values between 0 and 1. The R squared value becomes increasingly larger and approaches 1 as the model fits better. This makes the measure simple, clear and easy to interpret. There are several forms of R squared with different merits or predictive abilities.

Other studies have employed various test criteria, including McFadden R^2, Akaike Criterion, Schwarz Criterion, the Hannan-Quin Information Criterion, Cox & Snell R Squared, Nagelkerke R Squared and Lin's Concordance, to test the predictive ability of logistic regression models (Lin and Peasnell, 2000a). The suitability of the test criteria

would depend on whether the models to be compared are nested or not. The test criteria are in some cases used as alternatives although admittedly they have different predictive abilities. After observing the merits and demerits of each test, we would employ the Cox and Snell R squared and Nagelkerke R squared test in our study to ensure robustness of our results.

The Cox and Snell pseudo R square measures the strength of association of a model. The strength of association refers to how well the independent variables in the model explain the changes in the dependent variable (Shtatland et al., 2000).

The Cox and Snell pseudo R square is based on the log likelihood but takes into account the size of the sample. It is given below:

(4)

$$R_{CS}^2 = 1 - \exp\left[-\frac{2}{n}[LL(B) - LL(0)] \right]$$

It however falls short as a strong measure of association because its R square doesn't reach a maximum value of 1. Its use can be supported with the Nagelkerke measure which achieves the maximum value of 1. It is empirically given below:

.

$$R_N^2 = \frac{R_{CS}^2}{R_{MAX}^2}, \text{where } R_{MAX}^2 = 1 - \exp[2(n^{-1})LL(0)] \quad (5)$$

3.4.1.2.3 Likelihood

The likelihood or deviance measures how bad a model is. Deviance is the probability of the observed results given the parameter estimates. -2log likelihood is a standardised version of the likelihood. This value measures the extent to which the model fails to perfectly predict the values of the independent variable. It indicates the amount of

improvement required before the predicting independent variables accurately model the dependent variable. A model that fits perfectly has a -2log likelihood of 0 (Anderson et al., 2007).

3.4.1.2.4 The Z or Wald test and P Values

These measures test individual Predictors (independent variables) for significance by statistically verifying whether their coefficients are significantly different from zero (Anderson et al., 2007).

The Wald distribution is given below:

(6)

$$\frac{(\hat{\theta} - \theta_0)^2}{\mathrm{var}(\hat{\theta})}$$

3.4.1.2.5 Interpreting Coefficients

We would use P values and Z values or the Wald statistics (Anderson et al., 2007, p601) to investigate if the independent variables employed in the study are statistically significant. We use a 0.01 level of significance as used by Lin and Peasnell (2000a).

Logistic regression coefficients are interpreted using the Wald or Z test. The formula is given below:

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(7)

$$W_j = \frac{B_j}{SE_{B_j}}$$

where SEbj is the Standard Error of Bj.

In this study, the SPSS statistical software will be employed to perform the computations.

3.4.2 Market Reaction (Research Question 6)

This study employs the event study methodology to measure the effect of fixed asset revaluation announcements on the firms' market value. If an item of relevant information is received by stock market participants the market value of a firm is immediately readjusted to reflect this new information. This methodology fundamentally assumes that the market is at least semi strong form efficient. Semi strong form market efficiency implies that all past and current information about a stock is fully incorporated in the share price of the stock.

Fama (1998) find that apparent under-reaction to information is about as common as overreaction. Fama (1998) also find that post event continuation of Abnormal Returns is as frequent as post event reversals which indicates that the probability of obtaining positive Abnormal Returns after the announcement is equal to the probability of obtaining negative Abnormal Returns after the event date. The findings (Fama, 1998) above eliminate the incidence of any bias in the movement of share prices on a revaluation announcement. This implies any movement of share prices is reflected in the content and strength of the information supplied to the market. Event studies are a good approach to studying the effect of asset revaluation announcements on share prices.

Several models (including the Index model, Capital Asset Pricing Model and the Market Model) have been used in past studies to measure the wealth effects of various announcements, activities and events on shareholders. These events include the announcement of budgets, mergers and acquisitions (takeovers), research and development expenditure, appointment/deaths/resignation of chief executives, etc.

Following Sharpe and Walker (1975), the study used the market model to examine share price movements around the date of revaluations. The strength of the market model lies in its simplicity and effectiveness.

The market model states that the return on any security is a function of the return on the market portfolio (Rm) and the security's responsiveness to the market portfolio, modelled by its Beta (Strong, 1992).

Beaver (as cited in Strong, 1992) finds that a simple market model allows researchers to carry out much more reliable statistical testing. There are other issues or problems frequently encountered in event studies, which include the effect of infrequent trading and the very disturbing 'size effect'. Dimson and Marsh (1986) and Brown and Warner (1985) find that the simple market model helps to resolve the 'size effect' problem and ensures that the effect of infrequent trading is, at best, immaterial to the results obtained. Brown and Warner (1985) further test the model under different conditions and they conclude that the simple market model performs well when compared to other more convoluted models.

The market model is mathematically defined as follows (Sharpe and Walker, 1975, pp. 298):

$$Rit = \alpha + \beta i * Rmt + \lambda it \qquad (8)$$

Where

- Rit = the monthly return for firm i in month t
- Rmt = the 'market' rate of return in month t
- α = a constant, representing the excess return not predicted by the market
- λit = a random error term for month t (this represents any abnormal earnings)
- βi = the systematic risk of firm i

The monthly return for firm i in month t denoted by Rit is computed from the price index data:

$$Rit = Log [PIit / PIit-1] \quad (9)$$

where

PIit-1 is the return index of security i in month t-1

The monthly return on the market Rmt is similarly calculated using the following formula:

$$Rmt = Log [PImt / PImt-1] \quad (10)$$

where

PImt-1 is the market index at month t-1

Strong (1992) finds that logarithmic returns are analytically more tractable and empirically more likely to be normally distributed. This makes the results obtained from statistical analysis more reliable.

In this study, we consider the monthly return on New Zealand Government bonds as a proxy for our risk free rate of return. Sharpe and Walker (1975) considered a fixed value for all observations over different time periods and they acknowledged this as one of the weaknesses of their analysis. Ordinary least squares (OLS) regression is used to explore the relationship between share price movements around the date of the revaluations.

Approximately 60 monthly observations are used to estimate the parameters αt and βi excluding 12 observations before and 12 observations after the announcement, with the assumption that the responses to asset revaluation would be reflected in share prices within this period (Sharpe and Walker, 1975). We therefore have an estimation period of 35 months and a test period of 25 months.

3.4.2.1 Beta and its Significance

The beta for each firm is calculated by running a simple linear regression between the return index of the firm and the return of the market 'proxied' by the return on the New

Zealand Exchange All Index (NZX All Index). The values for the intercept and gradient obtained from the regression in the estimation period were used to calculate the expected returns in the test period by using the simple formula:

ER= Intercept + (Gradient* Market Return) (11)

The gradient represents the beta of the stock. The beta measures the variability or relationship between the returns of a firm and the return of the entire market. In other words, it shows the correlation between the return of the firm and the return on the market.

3.4.2.2 Abnormal Returns

Once the expected return for each firm is computed from the beta, the intercept and the market return, the abnormal returns on the stock can be computed.

The abnormal returns or residuals constitute the difference between the expected returns of a stock and the actual returns. This computation performed for every firm in our sample for the test period (that is, month + 12 to month -12). The abnormal returns or residuals for firm *i* in any month *t* is given by:

$$\hat{\lambda}_{it} = R_{it} - (\hat{\alpha} + \hat{\beta}_i Rm_i) \quad (12)$$

The predicted values of Rit for the excluded months are calculated using the estimated value of αt, βi, and known values of Rmt. These predicted values, according to Sharpe and Walker (1975), are then subtracted from actual monthly returns in those months to obtain residual; λit for month t =-12 to month t = +12. Subsequently, these values are averaged across all revaluation cases to produce a series of average residuals. Cumulative average residual (CAR) is obtained to see if the market response is sustained over the

twelve post-announcement months (Sharpe and Walker, 1975).

3.4.2.3 Cumulating Average Residuals

The average residuals obtained in every month are cumulated to obtain the CAR. The CAR thus represents the returns that accrue to each firm due to the event – a revaluation announcement. Another method of cumulating average residuals over time is by calculating the Abnormal Performance Index (API) of the series. The empirical difference between both methods as cited by Strong (1992) is that CAR is more suitable when cumulating residuals for a portfolio that is continuously rebalanced while API gives the abnormal returns from initially investing equally in each security in a portfolio and holding the portfolio over the cumulation period. Following Sharpe and Walker (1975), we employ the CAR to cumulate average residuals over the test period.

The next chapter presents the results of the empirical analysis. A discussion of the results obtained will also follow.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Discussion Results for Research Questions 1 to 5

4.1.1 Sample Construction and Analysis

Table 4.1 provides details of the sample of New Zealand stocks used in the study. The sample in our study falls short when compared to the sample of over 1240 firms in the Lin and Peasnell's (2000a) study, but our original sample includes every listed firm in New Zealand. This therefore ensures that our results are not biased in any way. Unfortunately, our sample is further reduced from 135 cases to 39 in 1998 and 198 to 103 cases in 2005. This is due to unavailability or incompleteness of data in the database in some of the cases under investigation.

Table 4.1: The sample under investigation (1998 and 2005)

	1998	**2005**
Firms in Data stream NZ list stock	135	198
Less: Gov't & financial institutions, Oil & gas and utilities firms	2	3
Missing Data	94	92
Final Samples	39	103

	1998	**2005**
Devaluers (Down)	4	6
Current revaluers (REV)	11	24
Prior revaluers (PRREV)	2	8
Continuing Non revaluers (NONREV)	22	65
Total Samples	39	103

By relying on our streamlined sample, some trends are noticeable at this stage of the analysis. For example, the data in Table 4.2 shows that there has been a consistent trend to not revalue assets. We find that in 1998, over 50% of the firms under investigation had not revalued their assets in any of the relevant three years. This trend is again evidenced in 2005 as 65 of the 103 firms in the sample do not practice revaluation accounting. There is also a slight but noticeable fall in the percentage of firms that devalue their assets over the years. This can be attributed to the economic growth that New Zealand achieved since 1998.

Table 4.2: Subsamples under investigation (1998 and 2005)

Sample				
	1998	**%**	**2005**	**%**
Devaluers (Down)	4	10%	6	6%
Current revaluers (REV)	11	28%	24	23%
Prior revaluers (PRREV)	2	5%	8	8%
Continuing Non revaluers (NONREV)	22	56%	65	63%
Total Samples	39	100%	103	100%

Revaluation has been cited as a signal for growth opportunities by management (Lin and Peasnell, 2000a). The percentage of firms revaluing their assets in 1998 is slightly higher than that of 2005. This observation supports the hypothesis that management may use revaluation to signal future growth in companies.

4.1.2 Prior Revaluation History

Table 4.3 shows the revaluation history of the firms in our sample. Our results show that all (100%) firms which devalued their assets in 1998 had a prior (within the past three years) revaluation history. Only 20% of the 2005 devaluers had no prior revaluation history. We can conclude that there is a possibility that devaluation was carried out as a correction to prior revaluation or over valuation.

Table 4.3: Revaluation history of the firms in the subsamples under investigation

	1998 Revalued Previously			**2005** Revalued Previously		
	Yes	No	**Total**	Yes	No	**Total**
Devaluers (Down)	4	0	4	5	1	6
Current revaluers (REV)	10	1	11	22	2	24
Non revaluers (PRREV+NONREV)	2	22	24	8	65	73
Total	16	23	39	35	68	103

However, only 10% of the firms that revalued their assets in 1998 and 2005 had no prior revaluation history. We again find that most firms which do not revalue their assets (92% in 1998 and 89% in 2005) are consistent non revaluers. We can therefore conjecture that the firms which revalue their assets today are more likely to revalue them in the future and likewise firms which do not revalue their assets today are less like to revalue them in the future.

4.1.3 Revaluation and Devaluation Amounts

In Table 4.4 we investigate the degree or extent to which firms increase or decrease their asset values. We realise that in 1998 firms were almost equally likely to revalue their assets by any amount. The results show that about 50% of the firms in the sample revalued their assets by less than 10% and the rest by more than 20% of their net capital employed. However in the same year, fewer firms (25% of devaluers) devalued their assets by over 20% of their net capital employed. More devaluers (75%) devalued their assets by less than 10% of their net capital employed. In 2005, we find that devaluers were more willing to devalue their assets greatly. Over 33% of devaluers devalued their assets to more than 20% of their net working capital.

Table 4.4: Corporate revaluations amounts as a percentage of net capital employed

	1998 Revaluers		**1998** Devaluers		**2005** Revaluers		**2005** Devaluers	
	*	**	*	**	*	**	*	**
Less than 10%	6	54.5	3	75	10	41.7	3	50
Between 10% and 20%	0	0	0	0	5	20.8	1	16.7
20% or more	5	45.5	1	25	9	37.5	2	33.3
Total	11	100	4	100	24	100	6	100

* number of firms

** in percentage

4.1.4 Descriptive Statistics and Analysis of Independent Variables for 1998

Table 4.5 shows the descriptive statistics (mean, median and standard deviation) for the independent variables (size, debt, intensity, liquidity and market to book value ratio) in our study for 1998.

Table 4.5: Descriptive statistics for independent variables for 1998

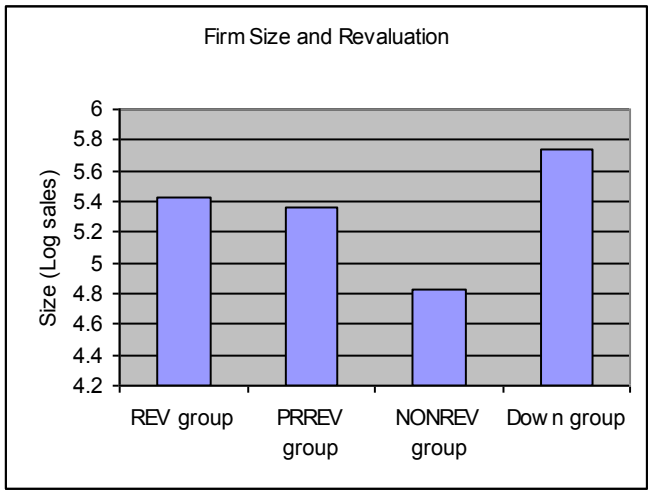
	SIZE	DEBT	INTENS	LIQ	MV/BV
REV group					
Mean	5.42267	0.244407	0.566968	0.56	2.35272
Median	5.146358	0.294523	0.522061	0.53	1.489952
Standard deviation	0.292208	0.067043	0.146331	0.151427	0.618366
PRREV group					
Mean	5.365001	0.19587	0.384443	0.8375	2.649716
Median	5.319496	0.235122	0.400819	0.835	2.649716
Standard deviation	0.256669	0.068101	0.075179	0.169183	0.838572
NONREV group					
Mean	4.828497	0.286115	0.528952	0.743182	3.38239
Median	5.095431	0.281831	0.52371	0.705	2.378871
Standard deviation	0.225065	0.042829	0.079772	0.102246	0.78327
Down group					
Mean	5.739631	0.37139	0.344713	2.335	5.227967
Median	5.739631	0.37139	0.344713	2.335	2.601426
Standard deviation	0.120068	0.042277	0.081393	1.415	3.246164

4.1.4.1 Firm Size

Firm size is computed from natural log of sales to allow for standardisation and cross comparison. We find that firms with higher sales figures were more likely to devalue their assets while firms with the least sales neither revalued nor devalued their assets. This is consistent with the results obtained by Missonier-Piera (2007). Missonier-Piera, working with a sample of Swiss firms, finds that there is a positive relationship between revaluation and proportion of foreign sales. However, the author's study does not fully investigate the relationship between sales and devaluation. Lin and Peasnell (2000a) find the firm size to be positively related to the probability of revaluing or devaluing.

Figure 1 shows that high performing firms are more likely to revalue or devalue their assets. This means continuous asset revaluation is more common in high performing firms.

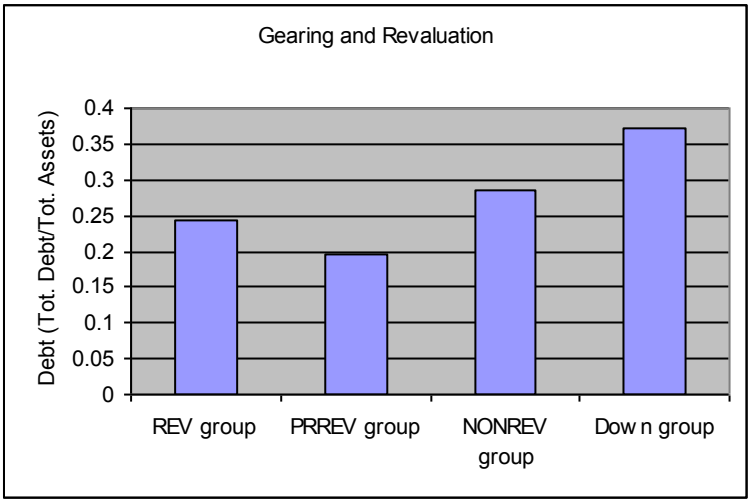
Figure 1: Relationship between firm size and revaluation for 1998



4.1.4.2 Debt

Surprisingly we find that the sample of New Zealand firms with a higher debt burden devalued their assets in the year 1998. In our sample, there is an increasing tendency for firms to not revalue upwards as their debt burden increases.

Figure 2: Relationship between gearing and revaluation for 1998



The results in Figure 2 differ from the results obtained by previous research investigating the relationship between gearing and revaluation. Prior researches including Missonier-Piera (2007), Cotter and Zimmer (1995), Jaggi and Tsui (2001), Brown et al. (1992) amongst others find a strong positive relationship between revaluation and debt contracting. The widely held view is that firms with a higher debt burden are more likely to revalue their assets to strengthen their balance sheets and give them room to borrow more or at least meet existing debt covenants. Cotter (1999) studying a group of Australian firms, however, find that due to the relationship with their bankers most Australian firms now prefer to disclose undervalued assets as a footnote in their financial statements instead of making an upward revaluation. Our study does not investigate this possibility.

Nevertheless, 1998 was the end of a recession in New Zealand and this may explain the perceived reluctance of firms to revalue their assets upwards even though they were

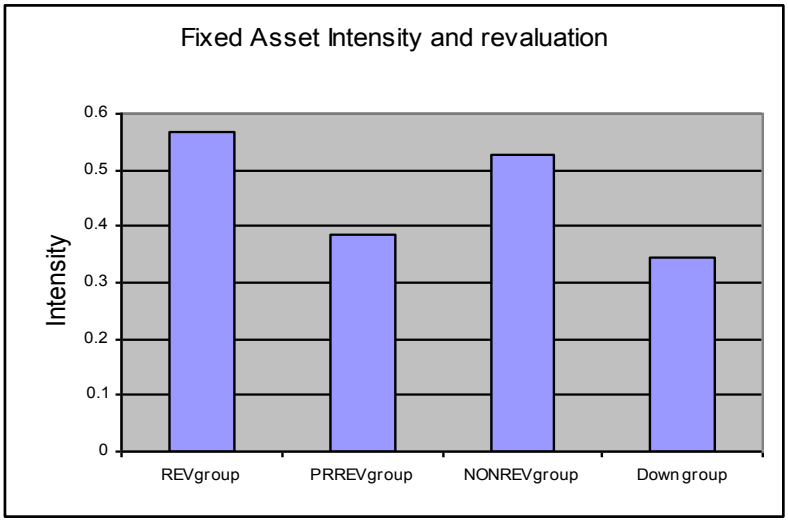
highly geared. This variable will be further investigated using regression analysis.

4.1.4.3 Fixed Asset Intensity

Fixed asset intensity represents the proportion of the firm's assets that consist of fixed assets. A firm can only revalue fixed assets which it possesses. It is thus probable that firms with a larger pool of fixed assets are more inclined to continuously revalue or devalue them. Our results show that a greater proportion of firms with higher fixed asset intensity (that is, higher proportion of fixed assets in their total assets) revalued their assets upwards in the year under investigation.

Figure 3 shows that there is a very low tendency for firms with high fixed asset intensity to devalue their assets. The result shows that some high fixed asset intensity firms do not revalue or devalue their assets. Thus, we deduce that high fixed asset intensity firms either revalue upwards or do not revalue their assets at all. The worth of high fixed asset intensity firms such as manufacturing and real estate firms is strongly dependent on the reported value of their assets.

Figure 3: Relationship between fixed asset intensity and revaluation for 1998

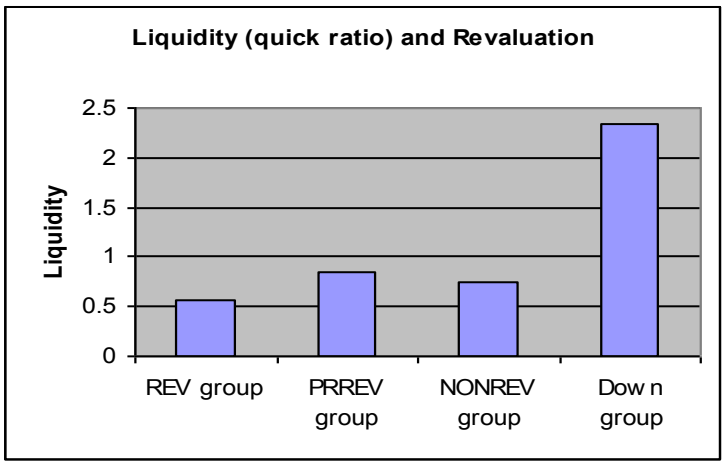


In our sample, firms with lower fixed asset intensity do devalue their assets. With a low proportion of fixed assets in their total assets, these firms may find it less daunting to devalue their assets since the effect on their total worth is smaller.

4.1.4.4 Liquidity

We find that the most liquid firms devalued their assets in the year under investigation while the least liquid firms revalued their assets (see Figure 4).

Figure 4: Relationship between liquidity and revaluation for 1998

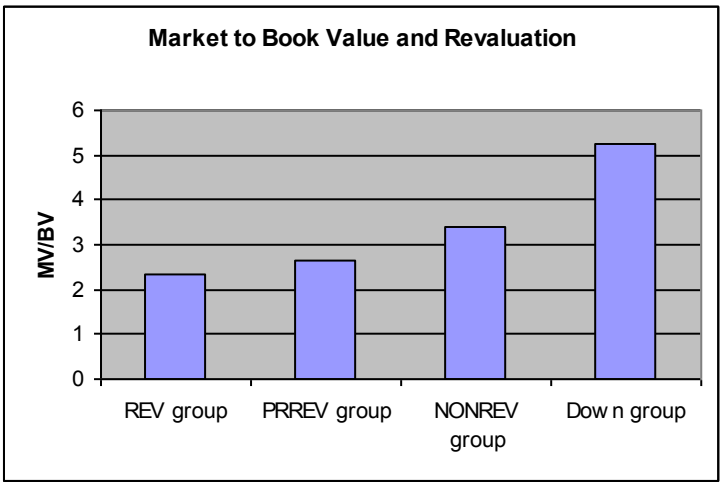


The result in Figure 4 is consistent with the view that revaluation gives a firm a strong collateral base on which to borrow more. It is also consistent with previous research findings that firms with decreasing cash flows have a higher probability of revaluing their assets (Cotter and Zimmer, 1995). Firms with adequate liquidity do not need to borrow and thus revaluation may not be necessary. The appropriateness of the valuation process may however be questioned. Seemingly the process has been used as a matter of convenience not appropriateness. We did not find any research evidence to support and explain our finding that firms with excess liquidity have a high probability of devaluing their assets.

4.1.4.5 Market Value to Book Value

The market to book value ratio of a firm models its growth opportunities and an appreciation in the value of assets over time. It shows the amount investors are willing to pay over the book value of the assets to hold investments in the firm. A high market value to book value ratio may indicate that the book value of fixed assets might have been understated. The expectation is that firms with a high market value to book value ratio will revalue their assets while firms with a low market value to book value ratio will devalue their assets. We find that firms with the highest market value to book value ratio rather devalue their assets in the year under investigation (see Figure 5). These results are consistent with the findings of Lin and Peasnell (2000a).

Figure 5: Relationship between market to book value and revaluation for 1998



4.1.5 Descriptive Statistics and Analysis for 2005 Sample

Table 4.6 shows the descriptive statistics (mean, median and standard deviation) for the independent variables (size, debt, intensity, liquidity and market to book value ratio) in our study for 2005.

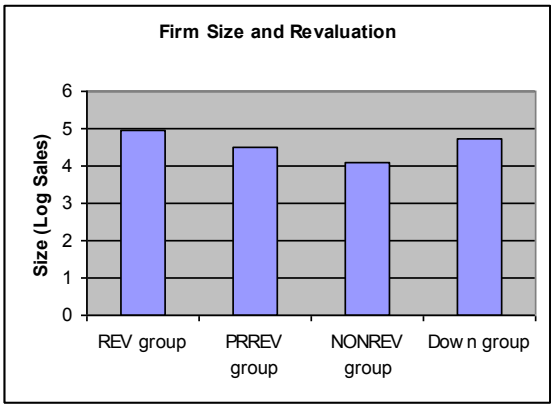
Table 4.6: Descriptive statistics for independent variables for 2005

	SIZE	DEBT	INTENS	LIQ	MV/BV
REV group					
Mean	4.946796	0.242123	0.560709	1.6328	2.969182
Median	4.861493	0.23091	0.565101	1.01	2.265983
Standard deviation	0.150994	0.045721	0.059402	0.312553	0.54289
PRREV group					
Mean	4.494864	0.200018	0.624887	1.684	3.256174
Median	5.606629	0.061606	0.724827	1.58	2.501697
Standard deviation	1.13142	0.108472	0.10774	0.513689	0.81777
NONREV group					
Mean	4.103922	0.231509	0.323455	1.925369	2.670966
Median	4.447871	0.211976	0.227654	1.01	1.608076
Standard deviation	0.214805	0.028709	0.034453	0.347783	0.447801
Down group					
Mean	4.740792	0.204876	0.341767	1.1675	1.232881
Median	4.623828	0.20189	0.177037	1.17	1.138841
Standard deviation	0.20013	0.050195	0.131107	0.148369	0.313252

4.1.5.1 Firm Size

Figure 6 shows similar trend obtained in 1998 (shown in Figure 1). The figure shows firms with highest sales figures revalue their assets in the reporting year. The figure also shows that the sample of firms that devalue their assets in the current year consists of firms with very high sales figures. We therefore conclude that the firms with the highest sales figures are likely to either revalue or devalue their assets in that same year. Firms with high sales figures are always perceived as bigger firms. They are more likely to be audited by international accounting firms. Prior research (Lin and Peasnell, 2000a) has hypothesised that bigger firms with bigger auditors are more likely to annually revise their asset values due to the pressure from their auditors.

Figure 6: Relationship between firm size and revaluation for 2005

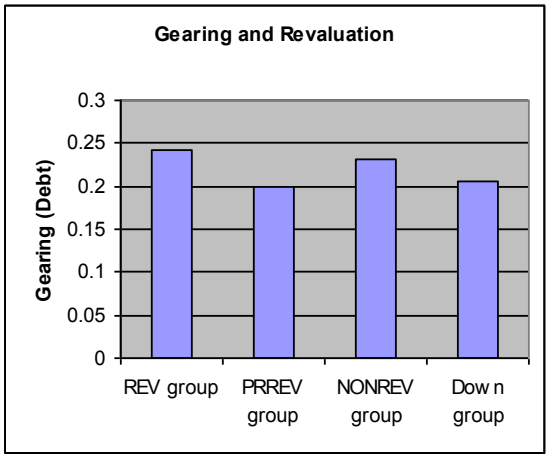


Firms with the lowest sales have no prior (past three year) history of revaluation or devaluation. Smaller firms are more likely to have smaller auditors and less pressure from investors. These firms have not revalued their assets in any of the relevant three years.

4.1.5.2 Gearing or Debt

Figure 7 shows the relationship between the level of debt and the decision to revalue. We find that the most highly geared firms are equally likely to revalue or not revalue their assets in that year. No explainable pattern is observed from Figure 7. This implies gearing does not play a very significant role in the revaluation decision.

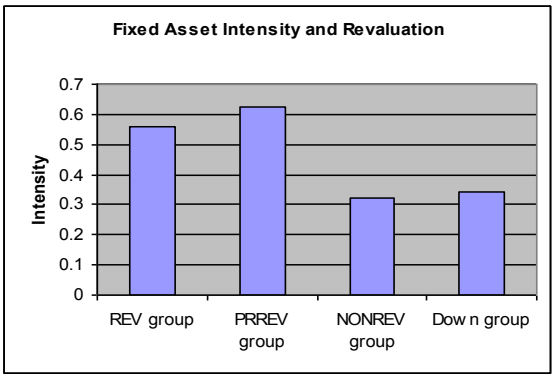
Figure 7: Relationship between gearing and revaluation for 2005



4.1.5.3 Intensity

Figure 8 reveals a relationship between intensity and the revaluation decision. We find that fixed asset intensity plays a significant role in the revaluation or devaluation decision. The higher the amount of fixed assets in the asset portfolio of a firm, the more likely it will revalue its assets. However, Figure 8 does not explain the timing of the revaluation decision.

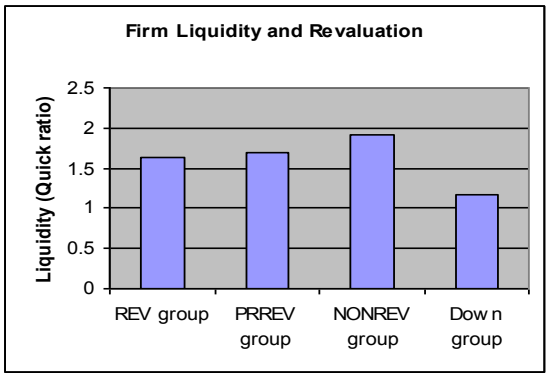
Figure 8: Relationship between fixed asset intensity and revaluation for 2005



4.1.5.4 Liquidity

Figure 9 shows most liquid firms do not revalue their fixed assets. As the firm's liquidity level rises over time, the probability that the firm will revalue its fixed assets decreases. This conforms the hypothesis that revaluation would be carried out to allow the firm to be able to raise cash (increase their liquidity) through borrowing. We also find that the least liquid firms devalued their fixed assets (Down Group).

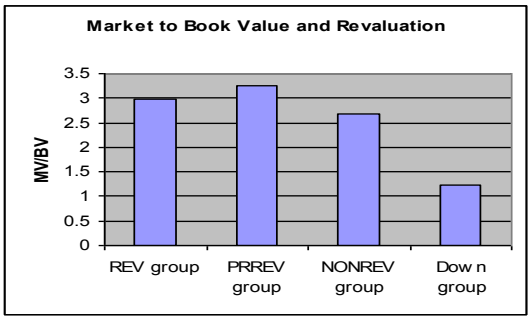
Figure 9: Relationship between liquidity and revaluation for 2005



4.1.5.5 Market Value to Book Value

Figure 10 shows firms in 2005 with the highest market to book value ratio had revalued their fixed assets either in the year under investigation or in the preceding two year period. A high market to book value ratio signifies growth opportunities or undervalued assets. The REV group of firms have a mean MV/BV ratio of 3. This indicates that the market is willing to pay 3 times the book value of the assets to acquire them. Revaluation may thus be seen as management's way of reducing the information asymmetry between the firm and its investors. Our result also shows that the firms with the least market value to book value ratios (i.e. ratios close to 1) devalued their assets.

Figure 10: Relationship between market to book value and revaluation for 2005



The following section presents the results of the logistic regressions and will only discuss the results of the models which posit a significant relationship between the dependent and independent variables.

4.1.6 Test Results Obtained for Model Analysis for 1998

4.1.6.1 Model 1: Comparison between REV and NONREV

Model 1 compares current revaluers to consistent non revaluers (see Table 4.7). The chi square tests the null hypothesis that all the coefficients of the five independent variables are equal to zero. At the 0.10 level of significance, we cannot reject the null hypothesis because the P values (sig.) are significantly greater than the level of significance (see

Table 4.7). Therefore, we cannot confidently conclude that the coefficients of our independent variables are significantly different from zero.

The results in Table 4.7 show that the independent variables (size, gearing, liquidity, intensity, market value to book value ratio) do not explain the decision by firms to revalue or devalue their fixed assets. This may be because there is an external variable or an omitted variable not represented in our models which explains the decision of firms to revalue their assets. New Zealand recovered from a recession in 1998 and we believe that this is a strong external economic and political factor that would have influenced our results for this year. It is no surprise that the model Cox and Snell and Nagelkerke R squares are low (i.e. below 0.10 in most cases).

Table 4.7: Comparison between REV and NONREV (Model 1) for 1998

	B	Standard Error	Wald Statistic	Degrees of freedom	Level of Significance	Exp (B)
Size	.087	.432	.041	1	.839	1.091
Gearing	-.856	2.310	.137	1	.711	.425
Intensity	.152	1.306	.014	1	.907	1.165
Liquidity	.462	.545	.719	1	.397	1.587
MV/BV	-.143	.179	.637	1	.425	.867
Constant	-.976	2.244	.189	1	.664	.377
Chi Squared				5	.821	2.197
-2Log Likelihood						39.813
Cox & Snell R Squared						.064
Nagelkerke R square						.089

4.1.6.2 Model 2: Comparison between REV and (PRREV + NONREV)

Similar to Model 1, the high chi squared value obtained (see Table 4.8) shows that we cannot confidently conclude that there was a relationship between revaluation or the decision to revalue and level of firm internal variables such as liquidity, fixed asset intensity, gearing, size and the market to book value ratio. This is because the independent variables used in the study did not adequately explain the decision by firm to revalue their assets for the period 1998. This is further constrained by the sample size and observations used in the study.

Table 4.8: Comparison between REV and (PRREV + NONREV) (Model 2) for 1998

	B	Standard Error	Wald Statistic	Degrees of freedom	Level of Significance	Exp (B)
Size	-.066	.395	.028	1	.867	.936
Gearing	-1.518	2.290	.439	1	.507	.219
Intensity	.459	1.279	.129	1	.720	1.583
Liquidity	.158	.410	.148	1	.700	1.171
MV/BV	-.168	.186	.812	1	.368	.846
Constant	.026	1.924	.000	1	.989	1.026
Chi Squared				5	.872	1.830
-2Log Likelihood						41.744
Cox & Snell R Squared						.051
Nagelkerke R square						.072

4.1.6.3 Model 3: Comparison between (REV + PRREV) and NONREV

In Table 4.9, the results obtained for Model 3 are similar to the results obtained for Model 1 and 2. The conclusion remains that, due to the size of the Chi square obtained, we cannot statistically justify a relationship between the dependent and independent variables for the year 1998.

Table 4.9: Comparison between (REV + PRREV) and NONREV (Model) 3 for 1998

	B	Standard Error	Wald Statistic	Degrees of freedom	Level of Significance	Exp (B)
Size	.255	.435	.344	1	.558	1.291
Gearing	-.381	2.190	.030	1	.862	.683
Intensity	-.207	1.282	.026	1	.871	.813
Liquidity	.686	.476	2.077	1	.150	1.985
MV/BV	-.130	.175	.550	1	.458	.878
Constant	-1.864	2.211	.711	1	.399	.155
Chi Squared				5	.553	3.975
-2Log Likelihood						42.205
Cox & Snell R Squared						.107
Nagelkerke R square						.147

4.1.6.4 Model 4: Comparison between Down and (PRREV + NONREV)

Model 4 compares the dependent variables for firms that devalue their fixed assets and firms that had either not revalued their fixed assets in 1998 or had previously revalued their fixed assets in either of the relevant two years. Table 4.10 shows that the model Chi square of 11.692 with a P value of 0.039 is significant at the 0.05 level of significance. We can therefore conclude that a firm's decision to devalue its assets in 1998 is strongly dependent on one or more of the five dependent variables in the model. We can further investigate the overall fit of the model and the individual contributions of the different dependent variables from the results obtained above.

A high Nagelkerke R square of 0.61 shows that our model has a high explanatory ability and thus performs well. From Table 4.10, we find that the decision to devalue fixed assets in 1998 is positively related to the size and the market value of the firm and negatively related to the level of gearing, fixed asset intensity and firm's liquidity.

Fixed asset intensity (INTENS) has the highest coefficient of all the variables followed

by gearing and then the firm size. The higher the fixed asset intensity of a firm, the less likely it is to devalue its assets. This may be because a devaluation of fixed assets by one percent may take off a large proportion of the worth of a firm. However, firms with a small amount of fixed assets in their total assets are likely to willingly devalue these assets since devaluation does not reduce the firm's value significantly.

Exp (B) of 456.8 shows that for each additional unit of size increases the probability of a devaluation decision in a firm up to 456 times. Even though fixed asset intensity and gearing are negatively related to the decision to devalue, the results show that the probability that a firm would devalue its fixed assets did not decrease as more units of gearing or intensity are added. This is indicated by an Exp (B) of 0.00.

The P values of all five independent variables are greater than the 10% error margin we are willing to accept. However, the variable representing market value to book value ratio (MV/BV) has a P Value of 0.13 which might be accepted as significant in this analysis.

From the results, we find that decisions to revalue and devalue are not both dependent on the firm internal variables under investigation.

Table 4.10: Comparison between Down and (PRREV + NONREV) (Model 4) for 1998

	B	Standard Error	Wald Statistic	Degrees of freedom	Level of Significance	Exp (B)
Size	6.124	4.928	1.545	1	.214	456.801
Gearing	-9.412	7.461	1.591	1	.207	.000
Intensity	-13.895	12.540	1.228	1	.268	.000
Liquidity	-2.187	2.614	.700	1	.403	.112
MV/BV	.757	.511	2.195	1	.138	2.133
Constant	-27.568	23.364	1.392	1	.238	.000
Chi Squared				5	.039	11.692
-2Log Likelihood						11.274
Cox & Snell R Squared						.341
Nagelkerke R square						.610

4.1.6.5 Summary of Logistic Regression Results for 1998

A summary showing the coefficients and P values obtained for all four models is shown in Table 4.11. Table 4.11 shows the Level of gearing, the Firm size, and the Fixed asset intensity contribute most to the devaluation decision. Gearing and Intensity are negatively correlated with the devaluation decision indicating that firms which are highly geared or highly fixed asset intensive are less likely to devalue their assets. On the other hand, big firms (modelled by their level of sales) are more likely to devalue their assets.

The empirical results show that none of the independent coefficients is significantly different from zero in all 4 models. The independent variables, Liquidity and Market to Book value ratio have the least explanatory power on the decision to revalue (see Table 4.11).

Table 4.11: Summary of coefficients and P values of Models 1-4 for 1998

		1998			
Explanatory variable	Expected Sign	Model 1	Model 2	Model 3	Model 4
Intercept	?	-0.97625	0.0257	-1.86414	-27.5682
		0.6636	0.9893	0.3991	0.238
GEARING	+	-0.85636	-1.51782	-0.3806	-9.41245
		0.7109	0.5075	0.862	0.2071
LIQ	-	0.461609	0.1579	0.685556	-2.18708
		0.3966	0.7003	0.1495	0.4027
MV/BV	+	-0.14258	-0.16768	-0.12994	0.757495
		0.4249	0.3675	0.4584	0.1385
SIZE	+	0.087474	-0.06626	0.255408	6.124248
		0.8394	0.8668	0.5576	0.2139
INTENS	+	0.152393	0.459035	-0.20739	-13.8947
		0.9071	0.7197	0.8715	0.2679

4.1.6.6 Relationship between the Dependent and Independent Variables for 1998

Table 4.12 shows that as opposed to the findings and predictions of other researchers (Missonier-Piera, 2007; Cotter and Zimmer, 1995; Lin and Peasnell, 2000a), the level of gearing is inversely related to the probability of a revaluation decision in our 1998 sample. Again, Liquidity seemingly though not consistently, has a positive relationship with the dependent variable while the MV/BV variable shows a negative relationship. We should be careful in interpreting these results since Models 1, 2 and 3 are not statistically robust.

Table 4.12: Summary of the relationship between variables in Models 1 to 4 for 1998

	Expected	Model 1	Model 2	Model 3	Model 4
Gearing/Debt	+	-	-	-	-
Liquidity	-	+	+	+	-
Market Value to Book Value	+	-	-	-	+
Size	+	+	-	+	+
Intensity	+	+	+	-	-

4.1.7 Test Results Obtained for Model Analysis for 2005

4.1.7.1 Model 1: Comparison between REV and NONREV

Model 1 compares the REV group and NONREV group. Table 4.13 shows that the model chi square of 15.413 is significant at the 0.01 level of significance. We ascertain that there is a significant relationship between the decision whether or not to revalue fixed and the firm's level of gearing, size, intensity, liquidity and market value to book value ratio.

The Cox and Snell R Square and the Nagelkerke R Square are very low i.e. 0.157 and 0.227 respectively indicating that the independent variables in the logistic regression (comparing current revaluers to consistent non revaluers) do not fully explain variations

in the dependent variable (revaluation). We can conclude that there might be other important variables our model did not capture but we will explain the motivations of firms to revalue their fixed assets in any given year. Other studies have cited other variables, such as profitability, previous revaluations, future operating performance, economic forces and political costs which affect the revaluation decision of firms (Lin and Peasnell, 2000b; Jaggi and Tsui, 2001; Aboody et al., 1999).

The decision to revalue assets is found to be directly related to the firm size, fixed asset intensity and firm liquidity. It is negatively related to the gearing and market value to book value ratio of the firm. Our results show that only the coefficients of size and fixed asset intensity are significant at 0.10 and 0.01 levels respectively. An increase in a firm's size by one unit does not significantly increase the probability of a revaluation decision in the current year but an increase in the fixed asset intensity in any year by one unit increases the probability of a revaluation 12-fold (see Table 4.13). Intensity is thus the most contributory variable and the main determinant in this model.

Table 4.13: Comparison between REV and NONREV (Model 1) for 2005

	B	Standard Error	Wald Statistic	Degrees of freedom	Level of Significance	Exp (B)
Size***	.445	.247	3.240	1	.072	1.561
Gearing	-1.184	1.547	.586	1	.444	.306
Intensity*	2.531	.900	7.919	1	.005	12.569
Liquidity	.003	.122	.001	1	.980	1.003
MV/BV	-.017	.083	.042	1	.837	.983
Constant	-3.802	1.329	8.188	1	.004	.022
Chi Squared				5	.009	15.413
-2Log Likelihood						90.939
Cox & Snell R Squared						.157
Nagelkerke R square						.227

* Significant at the 0.01 level

*** Significant at the 0.10 level

4.1.7.2 Model 2: Comparison between REV and (PRREV + NONREV)

Model 2 compares the REV group and the (PRREV + NONREV) group. Model 2 has a P value of 0.01 and is significant at the 0.01 level of significance (see Table 4.14). We therefore conclude that the coefficient of one or more of the independent variables in the model is significantly different from zero.

Similar to Model 1, the Cox and Snell R Square and the Nagelkerke R Square are both below 0.30 indicating that our model does not have full explanatory power. Some variables which could further explain the motivations for revaluation of fixed assets have been omitted. This includes macroeconomic country specific variables, such as economic growth forecasts, employment, national debt levels, interest rates, and exchange rates.

For the firms in these groups, the decision whether to revalue is found to be positively related to the firm's fixed asset intensity, the firm's liquidity, the firm's size and the firm's market value to book value ratio. The revaluation decision is also found to be negatively related to the firm's gearing level. According to the Wald statistics and the P value (sig.), we find that at the 0.10 level of significance both the firm size and the fixed asset intensity have a significant positive relationship with revaluation.

Similarly, we find that intensity is the variable with the most contributory power. An increase in the fixed asset intensity by one unit may increase the probability of a revaluation decision up to 11 times (see Table 4.14).

Table 4.14: Comparison between REV and (PRREV + NONREV) (Model 2) for 2005

	B	Standard Error	Wald Statistic	Degrees of freedom	Level of Significance	Exp (B)
Size***	.452	.256	3.119	1	.077	1.572
Gearing	-1.063	1.535	.480	1	.489	.345
Intensity*	2.439	.861	8.014	1	.005	11.460
Liquidity	.028	.121	.052	1	.820	1.028
MV/BV	.006	.081	.005	1	.944	1.006
Constant	-4.065	1.373	8.763	1	.003	.017
Chi Squared				5	.010	15.046
-2Log Likelihood						96.256
Cox & Snell R Squared						.142
Nagelkerke R square						.210

* Significant at the 0.01 level

*** Significant at the 0.10 level

4.1.7.3 Model 3: Comparison between (REV + PRREV) and NONREV

Model 3 compares (REV + PRREV) and NONREV, that is, firms that have revalued their fixed assets either in the present year or in any of the previous two years and firms which have not revalued their fixed assets in the three year period. From Table 4.15, we find that with this group of firms, the revaluation decision is positively related to the firm's size and the firm's fixed asset intensity and negatively related to the firm's level of gearing, liquidity and its market value to book value ratio. Based on the Wald statistic and the P values, our results show that only the size and intensity are significant at the 0.05 level of significance. The contributory power of both variables is the same as in Models 1 and 2.

Table 4.15: Comparison between (REV + PRREV) and NONREV (Model 3) for 2005

	B	Standard Error	Wald Statistic	Degrees of freedom	Level of Significance	Exp (B)
Size**	.452	.215	4.416	1	.036	1.571
Gearing	-1.661	1.419	1.370	1	.242	.190
Intensity**	1.918	.794	5.831	1	.016	6.810
Liquidity	-.071	.118	.367	1	.545	.931
MV/BV	-.075	.082	.838	1	.360	.928
Constant	-2.837	1.090	6.769	1	.009	.059
Chi Squared				5	.012	14.701
-2Log Likelihood						110.513
Cox & Snell R Squared						.139
Nagelkerke R square						.193

** Significant at the 0.05 level

4.1.7.4 Model 4: Comparison between Down and (PRREV + NONREV)

The high P value in this model (see Table 4.16) makes the model problematic. We cannot reject the null hypothesis that the coefficients of independent variables are significantly different from zero. We therefore cannot conclude that in 2005 the decision whether or not to devalue fixed assets was reliant on one or more of these independent variables. Even though we cannot ascertain a significant statistical relationship between dependent and independent variables, we find that the level of gearing and the level of fixed assets within the companies in the sample have the most explanatory power on the decision to devalue assets.

Table 4.16: Comparison between Down and (PRREV + NONREV) (Model 4) for 2005

	B	Standard Error	Wald Statistic	Degrees of freedom	Level of Significance	Exp (B)
Size	.182	.344	.280	1	.597	1.199
Gearing	-3.524	4.103	.738	1	.390	.029
Intensity**	3.793	1.868	4.124	1	.042	44.405
Liquidity	-.013	.218	.004	1	.953	.987
MV/BV	.007	.157	.002	1	.966	1.007
Constant	-4.547	1.923	5.593	1	.018	.011
Chi Squared				5	.344	5.630
-2Log Likelihood						31.515
Cox & Snell R Squared						.070
Nagelkerke R square						.184

* *Significant at the 0.05 level

4.1.7.5 Summary of Logistic Regression Results for 2005

A summary showing the coefficients and P values obtained for all the four models is shown in Table 4.17. The results show the level of Gearing and Fixed asset intensity contributes most to the revaluation or devaluation decision. Gearing is negatively correlated with the revaluation decision indicating that firms which are highly geared are less likely to revalue their assets upwards. The results show only fixed asset intensity (INTENS) is significantly different from zero in all 4 models.

The magnitude of the 'SIZE' variable appears to be small thus having a smaller impact on the revaluation decision, but the results show that SIZE is statistically significant in Models 1, 2 and 3. The results also show Liquidity and Market to Book value ratio have the least explanatory power on the decision to revalue.

Table 4.17: Summary of coefficients and P values of Models 1 to 4 for 2005

		2005			
Explanatory	Expected	Model 1	Model 2	Model 3	Model 4
variable	Sign	-3.80167	-4.06522	-2.83672	-4.54705
Intercept	?	0.0042	0.0031	0.0093	0.018
GEARING	+	-1.18406	-1.06322	-1.66092	-3.52351
		0.444	0.4885	0.2417	0.3904
LIQ	-	0.003021	0.027558	-0.07127	-0.01298
		0.9802	0.82	0.5446	0.9525
MV/BV	+	-0.01703	0.005655	-0.07498	0.00667
		0.8372	0.9443	0.3598	0.9662
SIZE	+	0.445137	0.45247	0.451567	0.181776
		0.0719	0.0774	0.0356	0.5969
INTENS	+	2.531245	2.438823	1.918381	3.793358
		0.0049	0.0046	0.0157	0.0423

4.1.7.6 Relationship between the Dependent and Independent Variables for 2005

Prior research has depicted a positive relationship between gearing and revaluation (Missonier-Piera, 2007; Cotter and Zimmer; 1995; Lin and Peasnell, 2000a). However, none of our models support these findings (see Table 4.18). Our findings on the effects of firm size and fixed asset intensity corroborate the work of Lin and Peasnell (2000a). From the analysis and past researches, the consensus is that a firm with a higher sales figure (bigger size) and higher fixed asset intensity is more likely to revalue its assets (Lin and Peasnell, 2000a).

Our findings for the effects of liquidity and market value to book value ratio (MV/BV) on the revaluation decision are mixed (see Table 4.18). Lin and Peasnell (2000a), in their discussions, were unable to predict a relationship between the MV/BV and the revaluation decision because they interacted in various ways and it is unclear which forces will prevail in any particular situation. The high P values obtained for the MV/BV

and Liquidity variables in all four models show that both MV/BV and Liquidity variables play an insignificant role in the revaluation decision. Similarly, the effect of Gearing is also insignificant even though the variable posit a relationship with the dependent variable.

Table 4.18: Summary of the relationship between the dependent and independent variables for 2005

	Expected	Model 1	Model 2	Model 3	Model 4
Gearing/Debt	+	-	-	-	-
Liquidity	-	+	+	-	-
Market Value to Book Value	+	-	+	-	+
Size	+	+	+	+	+
Intensity	+	+	+	+	+

4.1.8 Test Results Obtained for Multicollinearity between Variables

There is a possibility that our independent variables are correlated thus giving rise to the issue of multicollinearity. This might seriously undermine the results of our logistic regression. Firms with huge stocks of fixed assets are more likely to acquire or employ debt capital in their operations. Thus gearing and fixed asset intensity in our model might be related. Further analyses are carried out (shown in Table 4.19) to investigate any incidence of this phenomenon.

Table 4.19 shows the correlation between the independent variables is very low and thus will not have a significant effect on the results obtained from the multiple regression analysis. Therefore, multicollinearity does not pose a problem in our regression models.

Table 4.19: Multicollinearity between the variables

			1998		
	SIZE	DEBT	INTENS	LIQ	MV_BV
SIZE	1	0.181017	0.322176	-0.15639	-0.02632
DEBT	0.181017	1	0.059369	-0.21487	-0.04915
INTENS	0.322176	0.059369	1	-0.11626	0.315158
LIQ	-0.15639	-0.21487	-0.11626	1	-0.02221
MV_BV	-0.02632	-0.04915	0.315158	-0.02221	1
			2005		
SIZE	1	0.30274	0.211261	-0.17893	0.085494
DEBT	0.30274	1	0.128295	-0.31848	0.020467
INTENS	0.211261	0.128295	1	-0.1001	0.165365
LIQ	-0.17893	-0.31848	-0.1001	1	-0.18728
MV_BV	0.085494	0.020467	0.165365	-0.18728	1

4.2 Discussion Results for Research Question 6

4.2.1 Sample Analysis

Table 4.20 presents the sample of firms under investigation. The market index considered in this case is the New Zealand Exchange Share Index. Our sample consists of 19 New Zealand firms that revalued their assets between 2001 and 2005 inclusive. We find that some firms revalue their assets almost every year. Table 4.20 shows that seven of the 19 firms under investigation revalued their assets five times in the five years under investigation, one firm revalued its assets four times in the five years, two firms revalued their assets three times, three firms revalued their assets twice and six firms revalued their assets once in the five years. The frequency of revaluation within the sample is summarised in Figure 11.

Figure 11 shows that about 40% of firms involved in the study are frequent or consistent revaluers, while about 30% of firms involved are infrequent revaluers. In a bid to understand the motivation to consistently revalue, we further investigated to see if the probability of a revaluation depends on its industry or its level of fixed asset intensity.

Table 4.20: Revaluation Date

Firm	Revaluation Date
Auckland International Airport	Jun-01
	Jun-02
	Jun-03
	Jun-04
	Jun-05
Allied Farmers Ltd	Jun-05
Broadway Industries Ltd	Jun-05
Colonial Motor Firm Ltd	Jun-01
	Jun-02
	Jun-03
	Jun-04
	Jun-05
Fletcher Building Ltd	Jun-01
	Jun-02
	Jun-03
Horizon Electricity Distribution Ltd	Mar-01
	Mar-02
	Mar-03
	Mar-04
	Mar-05
Heritage Gold NZ Ltd	Mar-01
	Mar-02
Hallenstein Glasson Holdings Ltd	Aug-04
	Aug-05
Infratil Ltd	Mar-02
	Mar-03
	Mar-04
	Mar-05
ING Medical Properties Trust	Jun-05
Kiwi Income Property Trust	Mar-01
	Mar-02
	Mar-03
	Mar-04
	Mar-05
Lombard Group Ltd	Jun-02
Lyttelton Port Firm Ltd	Jun-05
Millennium & Copthorne New Zealand Ltd	Dec-05
Metlifecare Ltd	Dec-01
	Dec-02
	Dec-03
	Dec-04
	Dec-05
Port of Tauranga Ltd	Jun-01
	Jun-02
	Jun-03
	Jun-04
	Jun-05
Ryman HealthCare Ltd	Mar-03
	Mar-04
	Mar-05
Sanford Ltd	Aug-01
	Aug-02
	Aug-03
	Aug-04
	Aug-05
Trustpower Ltd	Mar-04
	Mar-05

Figure 11: Revaluation in firms within the sample

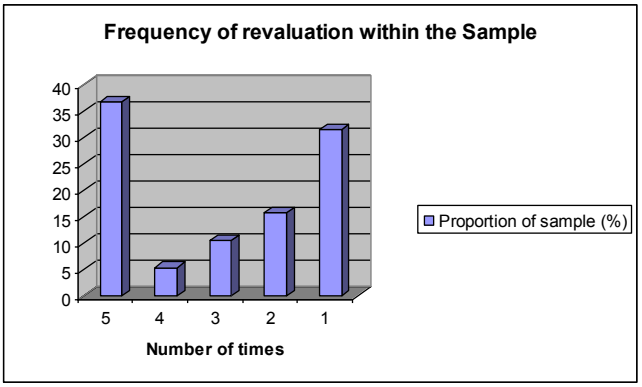


Table 4.21 looks at the fixed asset intensity of frequent revalues. We find that all companies which revalued their assets five times in the period under investigation are highly intensive companies with respect to their levels of fixed assets.

Table 4.21: Frequent Revaluers, Fixed Asset Intensity and Industry Specifics

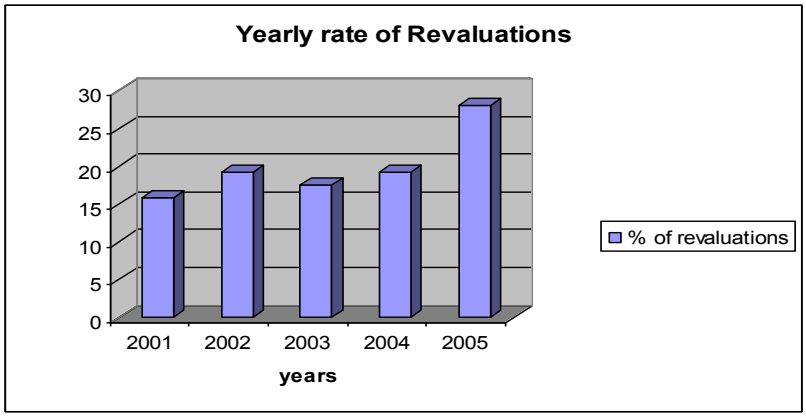
Consistent Revaluers	Frequency	Fixed Asset Intensity	Other notes
Auckland IA	5	Highly Intensive	Buildings, runways and equipment
Colonial MC	5	Highly Intensive	Huge stacks of vehicles and equipment
Horizon ED	5	Highly Intensive	Equipment for electricity production and distribution
Kiwi Income	5	Highly Intensive	Property investments
Metlifecare	5	Highly Intensive	Group has huge investments in property
Port of Tauranga	5	Highly Intensive	Buildings, docks and equipments
Sanford Ltd	5	Highly Intensive	Seafood, fishing, preservation, storage and distribution equipment

Table 4.22 and Figure 12 show that the number of revaluation announcements made each year was almost constant until year 2005. We find that over 28% of our sample revaluation announcements are made in 2005. An average of 10 revaluation announcements are made each year between 2001 and 2004, while 16 announcements are made in 2005. This year (2005) coincides with the adoption of the IFRS by New Zealand.

Table 4.22: Yearly Rate of Revaluation within the sample

Years	2001	2002	2003	2004	2005	Total
Number of events	9	11	10	11	16	57
Percentage	15.8	19.3	17.5	19.3	28.1	100

Figure 12: Yearly rate of revaluation within the sample



4.2.2 Average Residuals and Cumulated Average Residuals Computed

Table 4.23 summarises the results obtained for the monthly average residual and the monthly cumulative average residual.

Table 4.23: Results obtained for average residuals and cumulative average residuals for the sample under analysis in the test period

Month Relative Announcement Date	Average Residuals (AR)	Cumulative Average Residuals (CAR)
-12	0.292516731	0.292516731
-11	0.96399221	1.256508941
-10	-0.204312052	1.05219689
-9	-0.144070471	0.908126419
-8	1.250738177	2.158864595
-7	-0.43634164	1.722522955
-6	0.181387816	1.903910771
-5	0.624304097	2.528214868
-4	-0.452687597	2.075527271
-3	-0.150146776	1.925380496
-2	-0.073850696	1.851529799
-1	-0.070443712	1.781086087
0	**0.562072134**	**2.343158221**
1	0.03153884	2.374697061
2	0.669053398	3.043750458
3	-0.605536399	2.43821406
4	0.593200524	3.031414583
5	-0.3685523	2.662862283
6	-0.097140722	2.565721561
7	1.145497713	3.711219274
8	-0.54708004	3.164139234
9	0.06358343	3.227722664
10	-0.69971118	2.528011484
11	0.692283471	3.220294955
12	-0.078564782	3.141730174

Table 4.23 shows that the monthly average residuals do not follow any set pattern. It is almost equally likely to earn positive abnormal returns as it is to earn negative abnormal returns. In the four month period prior to the event date, we find that the average residuals are all negative. This trend is not repeated elsewhere in the event window. Even though the residuals prior to the event day are negative, we find that their magnitude gradually reduces as we approach the event day. On the event day (month zero), the average residuals revert to positive territory. We find a slight gain of 0.562% as shown in Table 4.23. These gains are not immediately lost. They are maintained for at least two months after the event date. Although we find more positive average residuals in the subsequent months, these are interspersed with negative average residuals. This complex mix of positive and negative residuals makes it difficult to identify a pattern and thus impossible to understand the reasons for these subsequent gains or losses.

Accumulation of the average residuals obtained during the entire period presents an empirically more explainable picture. We find that even though some months had registered negative abnormal returns, the general trend is a resultant gain from the event. The issue with cumulating average residuals may be due to the event window being too long and thus might have included gains realised from other major announcements and events (noise). Given that the event is an announcement of a revaluation of fixed assets, we can assume that it might be difficult for investors to anticipate this kind of announcement 12 months prior to the announcement date. Even if this was anticipated, the announcement would have been made in the quarterly or biannual reports. We therefore observed the cumulated average residuals over a shorter period, as shown in the Table 4.24.

Table 4.24: Shortened Test period to observe average residuals and Cumulative average residuals around the event date

Month Relative Announcement Date	Average Residuals (AR)	Cumulative Average Residuals (CAR)
-2	-0.0738507	-0.0738507
-1	-0.0704437	-0.1442944
0	**0.5620721**	**0.4177777**
1	0.0315388	0.4493166
2	0.6690534	1.11837

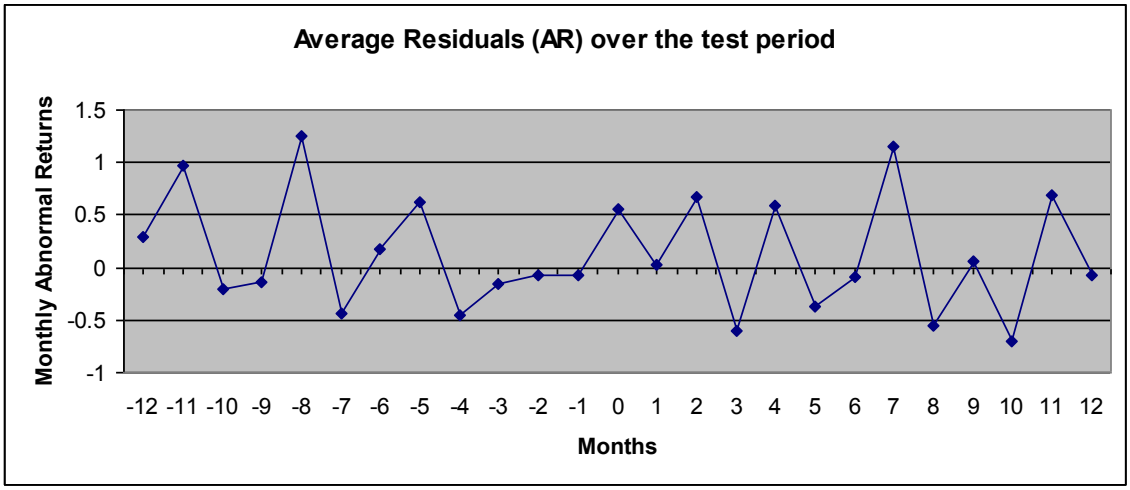
The cumulated average residuals in the run-up to the event date are negative. These negative residuals are however offset by the huge positive abnormal returns earned on announcement day. These gains are maintained in the subsequent two months.

When we observe Figure 13 for the 25-month period, we find no significant shift in month 0 – event day. The figure shows that more significant gains are obtained in month -11, month -8, and month 7. Our research design does not explain the gains obtained in these months. We observe that losses are made in the four months that preceded the announcement day. There is a reversal of trend leading to a slight gain in the announcement month. The following month sees a steep drop to almost zero abnormal

returns. The absence of any overly significant gains in the announcement month could be explained in two ways.

- The information are absorbed by the market in the preceding months or
- The information received by the market is price irrelevant.

Figure 13: Average Residuals that were accrued over the test period

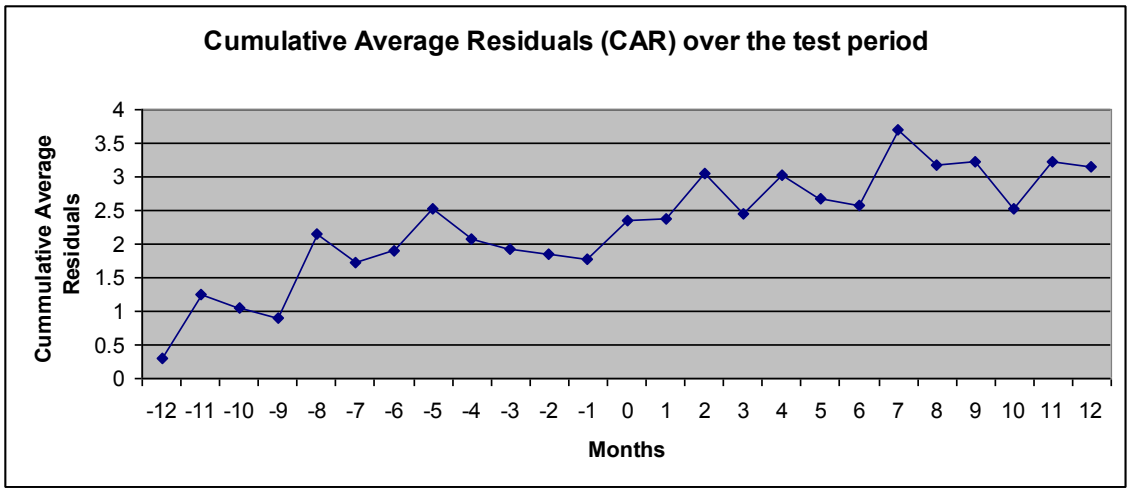


Emanuel (1989) working on a sample of New Zealand firms between 1970 and 1979 find that Asset Revaluation is a pure accounting artefact. The implication is that investors are not deluded by a purported increase in the value of their assets through a revaluation exercise. If firms are aware of this, then we can safely assume that the motive of asset revaluation by firms is not to mislead investors about the state of affairs but to reduce the information asymmetry between investors and management through better disclosure. Asset revaluation announcements seem to be an indicator of future expectations. Investors are also aware that management might decide to revalue assets for several reasons. Naturally, we expect that asset revaluation announcements will not be interpreted by investors as a positive signal unless there are other affirming positive indicators, such as sustained profitability, reducing debt levels, increasing sales levels, etc. Standish and Ung (1982) find that positive abnormal returns accrued to firms that announced fixed asset revaluations but after careful analysis they conclude that

revaluation announcements are only used as pointers and the market needs more information to assess the probable future position of firms. Courtenay and Cahan (2004) find that a high level of corporate debt actually impedes the levels of gains that accrue on revaluation announcements. These results are also obtained by Aboody et al. (1999). We do not however consider the debt levels of firms within our sample. The low announcement gains we have obtained might be due to the fact that some of the firms within our sample are highly geared.

On the other hand, if this information had already been incorporated into the current share prices so that in effect the information was already anticipated, then through a cumulative of average residuals we can effectively capture the effect of these announcements over our sample. Figure 14 investigates this possibility.

Figure 14: Cumulative Average residuals that were accrued over the test period

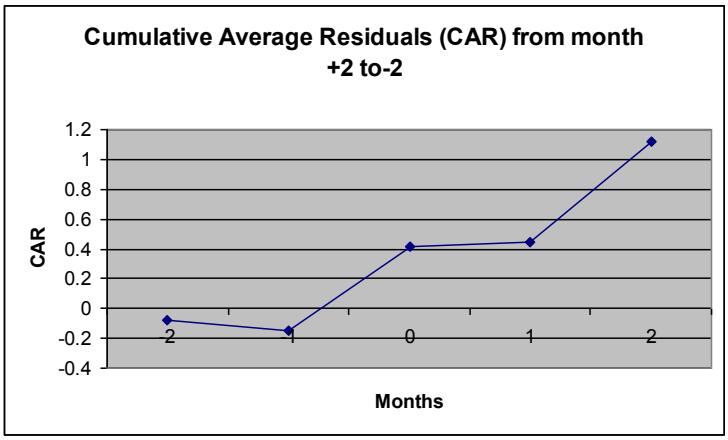


As discussed above, there is always a possibility that due to information leakage the abnormal returns might have been gained in the run up period to the event date (month). Price corrections or adjustments might be expected to occur as the market reassesses and re-evaluates the complete information after the event date. We therefore might expect prices to move up or down after the event and the results obtained in Figure 14 might not be unusual. Figure 14 shows that the cumulative positive average residuals are obtained

over the event window (month -12 to month +12). We however realised that high gains that are accrued until month 5 were quickly lost due to the high negative average residuals accrued in the four months immediately preceding the announcement day (month). The gains obtained up until month 0 are not lost in the subsequent 12 month period.

In Figure 15 we refocus on the period around the event day. Similar to Table 4.24, we minimise the effect of external influences by observing cumulated average residuals around the event date. In Figure 15 we observe cumulated average residuals over a shorter period of five months – two months before the event day and two months after the event day. The results are shown below:

Figure 15: Recalculated cumulated average residuals obtained over a shortened test period



With a significantly shortened event window we are able to show that gains accrue to firms announcing asset revaluations. The significance of these gains is subject to further statistical analysis. We can observe a slight nudge in Month Zero representing a slight gain due to the announcement. This announcement gain is maintained in the subsequent two months (see Figure 15).

4.2.3 Comparison between Frequent Revaluers and First Time Revaluers

In the sample under investigation, we find that some firms (frequent revaluers) revalue their assets almost as a matter of policy while others (first time revaluers) only revalued their assets for the first time after the inception of the IFRS standards in New Zealand in 2005. We classify these cases into two different subsamples (as shown in Table 4.25) for further investigation.

Table 4.25: Cases constituting subsamples of Frequent Revaluers and First Time Revaluers

Frequent Revaluers	**First Time Revaluers**
Auckland International Airport	Allied Farmers Ltd
Colonial Motor Firm Ltd	Broadway Industries Ltd
Horizon Electricity Distribution Ltd	ING Medical Properties Trust
Kiwi Property Trust	Lyttelton Port Firm Ltd
Sanford Ltd	
Port of Tauranga Ltd	

Table 4.26 shows the average residuals in the announcement month for the different subsamples are significantly different. On the announcement day (Month 0), Frequent revaluers only gained 0.8% abnormal returns while First Timer Revaluers earned a massive 4% on fixed asset revaluation announcements in 2005. In the case of Frequent Revaluers, the stock market had duly anticipated a revaluation in the current year (2005) and thus adjusted prices accordingly. Since frequent revaluers are noted for revaluing their assets yearly, the market discounts this information into current share prices and thus any revaluation announcement made will already be reflected in current share prices and investors will not act upon such information.

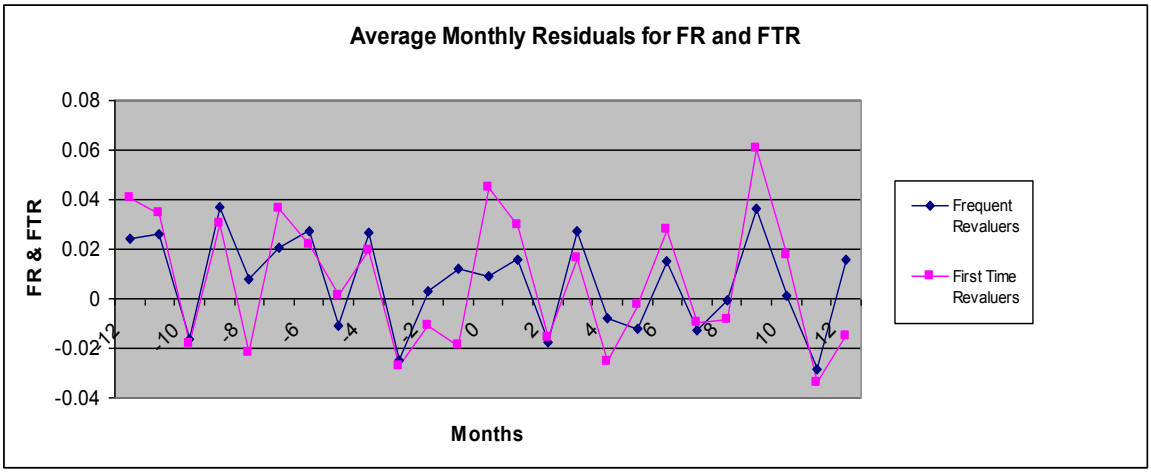
Table 4.26: Average Monthly Residuals for Frequent Revaluers and First Time Revaluers in 2005

Months	Frequent Revaluers	First Time Revaluers
-12	0.024332208	0.040438005
-11	0.025847312	0.034637665
-10	-0.016280931	-0.018348621
-9	0.037272702	0.030565568
-8	0.008077034	-0.022078071
-7	0.020439712	0.036382275
-6	0.027442713	0.021882169
-5	-0.010793248	0.001215777
-4	0.026833144	0.019213505
-3	-0.024845657	-0.02754791
-2	0.002769396	-0.01092365
-1	0.011976758	-0.018786534
0	**0.008996644**	**0.045043402**
1	0.015498654	0.029467971
2	-0.017534498	-0.015612773
3	0.02748522	0.016520035
4	-0.00761558	-0.025265456
5	-0.012208896	-0.002276491
6	0.014999293	0.028124349
7	-0.012991403	-0.009572922
8	-0.000845154	-0.008519884
9	0.036093019	0.060728028
10	0.001494483	0.017818066
11	-0.028240021	-0.033846723
12	0.015957809	-0.015364267

An asset revaluation announcement in the case of first time revaluers is a 'surprise' to 'the market' and thus 'the market' reacted by adjusting prices on the announcement day. For First Time revaluers, a revaluation announcement is not anticipated and thus the market receives this information as new information and acts upon immediately. We thus expect that if such information is relevant, prices should move significantly once the information is made to public. We therefore expect that if asset revaluation information is price relevant, then the market's reaction should be significantly different in both cases. From the results obtained, we deduce that asset revaluation information is price relevant.

Figure 16 shows the difference in monthly residuals earned by Frequent Revaluers and First Time Revaluers. We find that in the announcement month, Month 0, the difference in average residuals is quite significant. This signifies that the information received by the market (Asset Revaluation) is price sensitive.

Figure 16: Average monthly residuals for Frequent Revaluers (FR) and First Time Revaluers (FTR)



CHAPTER 5
SUMMARY AND CONCLUSION

5.1 Summary of Findings

5.1.1 Management Incentives (Research Questions 1 to 5)

This study examines the revaluation choices made by New Zealand firms in 1998 and 2005. The study evaluates the underlying variables which might have acted as a motivating factor for firm's revaluation decision. The study results show that fixed asset intensity and firm size significantly contribute to the revaluation decision. The results of all empirical models show that fixed asset intensity and firm size are positively correlated with the dependent variable (see Table 4.17). We therefore conclude that firms with high fixed asset intensity and/or firm size are most likely to adopt a continuous revaluation (positive or negative) policy.

A change in the size of a firm by one unit (e.g. log [sales] changes by one unit) does not significantly increase the probability of a firm making a revaluation decision in that year. However, fixed asset intensity shows a very strong contributory power to the revaluation decision. A change in the fixed asset intensity of a firm by one unit increases the probability of a revaluation decision almost 13-fold in some cases (see Table 4.13).

In contrast to the findings of previous studies (Whittred and Chan, 1992; Brown et al., 1992; Missionier-Piera, 2007), the level of corporate gearing is negatively related to the probability of revaluing assets for the sample of New Zealand firms in this study. However, the effect of the level of gearing on the revaluation decision is insignificant.

Our results did not provide any significant outcomes and relationships for 1998. This is because 1998 signified the end of recession and the beginning of economic growth in New Zealand. At the end of a recession, the changes in the country's economic environment might have superseded individual firm considerations in management's decision making process. We propose that aside from firm internal variables, several external variables might have motivated firms to devalue or revalue their assets in 1998. These variables include economic growth (recovery from the 1998 recession) and changes in the legal framework (adoption of the IFRS in 2005) amongst others.

5.1.2 Market Reaction (Research Question 6)

The empirical results show that the practice of revaluation increases sharply with the adoption of the IFRS in 2005 in New Zealand. About 28.1% of the revaluation announcements under study are made in 2005 compared to just over 15.8% in 2001.

We find that gains accrue to revaluing firms but these gains are not very significant. Given that other information was released at the same time, we cannot confidently associate all these gains to the fact that revaluation announcements are made. Thus, Standish and Ung's (1982) conclusion on their UK study might still hold in New Zealand today. The authors predicted that revaluation is probably seen by managers as a useful tool to influence capital market expectations about their firms but investors view revaluations in a fairly neutral way unless they receive associated positive signals or believe such signals will be shortly forthcoming

Furthermore, the empirical results show negative returns accrue to firms prior to the publication of financial statements that carry revaluation announcements. These negative returns are reverted as soon as the revaluation information is made public. These gains are again maintained for at least a month after the announcements are made. The statistical significance of these gains is subject to further investigation.

Comparing Frequent Revaluers to First Time Revaluers, we find that asset revaluation information is relevant to investors. Frequent Revaluers gained only 0.8% Announcement Abnormal Returns while First Time Revaluers gained over 4% in the 2005 (see Table 4.26).

5.2 Policy Implications

5.2.1 Management Incentives (Research Questions 1 to 5)

The findings of this study bring to light several pertinent issues that may call into question the adequacy and sufficiency of policy. Firstly, it might interest policy makers to know whether firms revalue or devalue their fixed assets arbitrarily. Should revaluation or devaluation not be based on the principle of fair value? The study shows that other factors such as the level of debt, cash flows or liquidity, and the size of the firm do affect firms' decision to revalue or not.

Logically and in principle, firms should only revalue or devalue when they are ascertain that the real or underlying value of their assets has been increased or decreased respectively, such that the values in financial statements do misrepresent the true state of affairs. If firms have other motives for revaluing or devaluing assets besides the principle of matching book values to real values, the exercise (revaluation) defeats its purpose. The finding that asset revaluations is motivated by changes in internal firm variables such as debt level, cash flows, liquidity and size questions the relevance and fairness of the revaluation process. There is little or no evidence to theoretically link firm size, debt level or liquidity with the probability of asset value appreciation. There is no evidence to show that bigger firms or more liquid firms are more susceptive to impairment of machinery. For example, one would not expect that the value of land owned by a more liquid and/or bigger firm appreciates/depreciates in value faster than land in the same country owned by a less liquid or smaller firm. Asset values are certainly shaped more by external

market influences.

The evidence provided in this study, indicates therefore that asset revaluation process might be problematic. This may also point to certain weakness in the laws and regulations governing asset revaluations. In the long run, it might not be surprising to see cases of corporate fraud arising from such an area which gives considerable leeway for the manipulation of financial reports based on the judgement of management.

Secondly, there is a question of whether the process is consistent across firms and across industries. The financial information released by the firms is only useful if it is consistent and comparable across all firms. If revaluations are solely based on management judgement and motivated by the internal state of affairs in a firm, then the practice will not be consistent across firms. This will reduce transparency and increase the information asymmetry between management, investors and regulators.

5.2.2 Market Reaction (Research Question 6)

The empirical results reveal that revaluation sends relevant information to investors. Whether this information is price sensitive and how this information is used by investors is subject to further research.

This study concentrated on significant positive asset revaluations made by firms between 2001 and 2005. In 2005, New Zealand adopted the IFRS standards which make revaluation optional for firms. Revaluers are however required to maintain a consistent revaluation practice. The implication of this study is that two competing firms within the same industry might be valued differently by virtue of their revaluation decision or their choice of whether to revalue or not. Since this information has been found to be of significance to investors, there is a question of whether firms who revalue their assets provide better disclosure to investors than their counterparts who do not. Is there a way of

disclosing this relevant information without necessarily revaluing assets? We find that some non revaluers might include a statement in their notes to financial statements that talks about current values of assets that have been historically accounted for in the balance sheet. Is this sufficient and does it include all relevant information needed by investors for their investment decision making?

From the empirical results, the only way to achieve consistency in reporting while increasing disclosure of information is to make revaluation compulsory for all firms. In this way we can ensure that the basic principles of reporting including consistency and comparability will be enhanced.

5.3 Research Limitations

5.3.1 Management Incentives (Research Questions 1 to 5)

5.3.1.1 The Size of Samples under Investigation

A point of concern in this study is the small number of data points that have been used to draw the conclusion. For example in 1998 the variable, Down has only four observations while PREV has only two. Again for 2005, the variable Down has only six observations while PRREV has only eight. Despite this perceived shortfall, it is worth noting that the sample constitutes a comprehensive list of all registered public companies in New Zealand in the two years under investigation. Cases are only left out when the information required to undergo the research is unavailable in the database used for the study. The results therefore reveal an empirical picture of the motivations for revaluation in the New Zealand accounting environment.

Despite this lack of a comprehensive data, the strength of the analysis is grounded in the fact that the original sample under investigation includes every listed firm in New

Zealand. The sample is only reduced due to incompleteness or unavailability of data in some of the cases under investigation. This data is classified as 'missing data' in the databases and data sources which are employed in the study.

Based on the empirical findings, strong trends could still be noticed that supported the conclusions that have been drawn from the study. Other measures of model strength such as Chi squared, R Squared, Likelihood, Z or Wald tests further helps to justify the results obtained.

5.3.1.2 The Research Questions under Investigation

A limitation of the study is that we did not investigate the relationship between individual variables and the fixed asset revaluation decision of the firms due to the time and resource constraints. We investigated the relationship between fixed asset revaluation and all five variables together. Therefore, although there is no significant statistical relationship between fixed asset revaluation and all five variables in 1998, there could be a significant relationship between fixed asset revaluation and each of the variables if investigated separately. However, we understand such analysis is not robust.

Another limitation in terms of the research questions is that the research set up to ascertain the relationship between fixed asset revaluation and firm variables such as debt to equity ratio, liquidity, market to book, size and fixed asset intensity. In the end, we were only able to determine the relationship between fixed asset revaluation and size and fixed asset revaluation and fixed asset intensity. Our results show that there is no statistical relationship between fixed asset revaluation and the other three independent variables (i.e. debt to equity, liquidity and Market to book). This result contradicts previous research and certainly worth to be explored in greater detail in future research.

5.3.2 Market Reaction (Research Question 6)

5.3.2.1 The Research Design and the Market Model

The market model employed in this study is designed to compute abnormal returns resulting from specific announcements. Information about asset revaluations in firms is only usually released together with other share price sensitive information (such as earnings and dividends) in published financial statements. Therefore, the abnormal returns earned on the publication of financial statements reflect the market's evaluation of not only information about asset revaluations but of all information that has been published. This model is not capable of segregating the abnormal returns that might have been accrued due to different items of information in the financial statements. The results we obtained relate to abnormal returns earned from the publication of financial statements. It is therefore empirically challenging to segregate the effects of each item of announcement to obtain the true contribution of the 'Asset Revaluation' variable.

Notwithstanding, Standish and Ung (1982) exclude the market model from their analysis because they found that estimates of alpha impacted behaviour in the period surrounding the announcement month. Standish and Ung (1982) show that the abnormal returns obtained by using the market model may be biased downwards. After testing several models for robustness, they (Standish and Ung, 1982), resolved to use the Capital Asset Pricing Model (CAPM).

5.3.2.2 The Choice of Measurement Interval

Several measurement intervals has been employed in previous studies including daily, weekly, fortnightly, and monthly amongst others. Sharpe and Walker (1975) and Standish and Ung (1982) investigate the relationship between revaluation announcements and share prices in Australia and the UK respectively used monthly data and an event window of 25 months. However, Morse (1984) investigating the bias and efficiency of the results

obtained from monthly and daily data came to the conclusion that shorter time periods are generally more suitable. Brown and Warner (1985) have corroborated these results through simulation studies. Longer event windows are problematic in that there is a higher probability of the inclusion of noise in the analysis. Other firm specific announcements such as quarterly results can also significantly move share prices and affect the results obtained.

In this study, we believe that due to increased disclosure over the years (i.e. the publication of quarterly, semi-annual and annual results) a shorter time period such as daily data might have produced better results.

5.4 Recommendations for Future Research

5.4.1 Management Incentives (Research Questions 1 to 5)

The adoption of International Financial Reporting Standards in New Zealand is a major step towards improving financial reporting across firms in New Zealand. Our sample investigates the motivations for firms to revalue their fixed assets before the adoption of the IFRS from the 1st January 2007. With new reporting standards, more research in this area using more recent data would be warranted.

In a related study, partitioning the sample into different industries, for example, manufacturing, real estate, etc. might yield more useful and robust information. Fixed asset intensity varies across industries and what might be very high for one industry and lower for another. The decision whether or not to revalue assets and the frequency of fixed asset revaluation might be different for different industries.

Our results indicate that the effect of a devaluation of fixed assets on the value of the firm

in particular may have a huge impact on the decision whether or not to devalue assets. The effect might be in terms of a fall in market value or a fall in book value of assets. A new variable which accounts for this effect may explain a firm's reluctance to devalue its assets and this would give more explanatory power to the model. Future researchers may include a variable that captures the actual increase in a firm's fixed asset values by revaluation or devaluation

5.4.2 Market Reaction (Research Question 6)

The magnitude of the revaluations could have a material effect on the cumulative abnormal returns obtained upon announcement. This study (similar to Sharpe & Walker, 1975) concentrates on the event, 'an announcement of a material fixed revaluation' and not on the actual increase in the value of the assets.

The study focuses on positive revaluations. The results would be more robust and conclusive if the effect of negative revaluations on stock prices is also investigated. If negative revaluations result in falling or negative cumulated average residuals, then the results would be more conclusive. Although this test will further strengthen the conclusions of this study, it was not carried out due to the lack of resources available to the researcher.

Some researchers (Aboody et al., 1999; Courtenay and Cahan, 2004; Easton et al., 1993) have found that other factors such as debt to equity ratio of firms influence the value relevance of a revaluation decision. A regrouping or dissociation of the study sample into different subsamples with different debt to equity ratios might provide more insights into the relevance of revaluation decisions in New Zealand. Other firm characteristics, such as the firm's level of fixed assets, the industry, the magnitude of revaluation, and the frequency of revaluation might also play a part in the market response to a revaluation announcement. These factors are worth investigating.

REFERENCES

1. Aboody, D., Barth, M. E., & Kasznik, R. (1999). Revaluations of fixed assets and future firm performance: Evidence from the UK. *Journal of Accounting and Economics, 26*(1-3), 149-178.
2. Anderson, D. R., Sweeney, D. J., Williams, T. A., Freeman, J., & Shoesmith, E. (2007). *Statistics for Business and Economics*, Thomson Learning.
3. Ball, R., & Foster, G. (1982). Corporate financial reporting: A methodological review of empirical research. *Journal of Accounting Research, 20*(Supplement 161), 234.
4. Barlev, B., Fried, D., Haddad, J. R., & Livnat, J. (2007). Reevaluation of revaluations: A cross-country examination of the motives and effects on future performance. *Journal of Business Finance & Accounting, 34*(7-8), 1025-1050.
5. Barth, M. E., & Clinch, G. (1998). Revalued financial, tangible, and intangible assets: Associations with share prices and non-market-based value estimates. *Journal of Accounting Research, 36*, 199-233.
6. Beneish, M. D., & Press, E. (1995). The resolution of technical default. *The Accounting Review*, 70(2), 337-353.
7. Bernard, V. L. (1993). Discussion of an investigation of revaluations of tangible long-lived assets. *Journal of Accounting Research, 31*, 39-45.
8. Black, E. L., Sellers, K. F., & Manly, T. S. (1998). Earnings management using asset sales: An international study of countries allowing noncurrent asset revaluation. *Journal of Business Finance & Accounting, 25*(9-10), 1287-1317.
9. Brealey, R. A., & Myers, S. C. (2004). *Principles of Corporate Finance* (3rd ed.). McGraw-Hill.
10. Brown, P., & Finn, F. (1980). Asset revaluations and stock prices: Alternative interpretations of a study by Sharpe and Walker. In R. Ball, P. Brown, F. Finn & R. Officer (Eds.), *Share markets and portfolio theory* (pp. 349-354). Queensland: University of Queensland Press.

11. Brown, P., Izan, H. Y., & Loh, A. L. (1992). Fixed asset revaluations and managerial incentives. *Abacus, 28*(1), 36-57.
12. Brown, R. & Warner, J. (1985) Using Daily Stock Returns: The Case Of Event Studies. *Journal of Financial Economics*, Vol. 14, 3–31
13. Cahan, S. F., Courtenay, S. M., Gronnewoller, P. L., & Upton, D. R. (2000). Value relevance of mandated comprehensive income disclosures. *Journal of Business Finance & Accounting, 27*(9&10), 1233-1265.
14. Carroll, T., & Linsmeier, T. (1997). *Fair value accounting: Evidence from close-end mutual funds*. Working paper, University of Illinois.
15. Casey, R. S., & Eddey, P. H. (1986). Defence strategies of listed companies under the takeover code. *Australian Journal of Management, 11*, 153-171.
16. Chatfield, M. (1974). A History of Accounting Thought. Hinsdale, *IL: Dryden Press*.
17. Christie, A. (1990). Aggregation of Test Statistics: An Evaluation of the Evidence on Contracting and Size Hypotheses. *Journal of Accounting and Economics*, January 1990, 15-36.
18. Clark, M. B., Maguire W., & Davies, T. (2006). Business Accounting and Finance in New Zealand. McGraw Hill.
19. Cotter, J. (1999). Asset revaluations and debt contracting. *Abacus, 35*(3), 268-285.
20. Cotter, J., & Zimmer, I. (1995). Asset revaluations and assessment of borrowing capacity. *Abacus, 31*(2), 136-151.
21. Courtenay, S. M., & Cahan, S. F. (2004). The impact of debt on market reactions to the revaluation of noncurrent assets. *Pacific-Basin Finance Journal, 12*(2), 219-243.
22. Deegan, C.M., & Hallam, A. (1991). The Voluntary Presentation of value Added Statements in Australia. *Accounting and Finance*, May 1991, 1-16.
23. Deloitte Touche Tohmatsu. (July 2001). *Accounting Alert – A Focus on Topical Financial Reporting and Accounting Issue*. Issue Number 12, retrieved April 1st, 2007, from http://www.iasplus.com/nz/alert12.pdf

24. Dimson, E. & Marsh, P. (1986). Event Study Methodologies and The Size Effect. *Journal of Financial Economics*, *17*, 113–142.
25. Duncan, K., & Moores, K. (1988). Usefulness of CCA Information for Investor Decision Making: A Laboratory. *Accounting and Business Research*, Spring 1988, 121.
26. Easton, P. D., Eddey, P. H., & Harris, T. S. (1993). An investigation of revaluations of tangible long-lived assets. *Journal of Accounting Research, 31*, 1-38.
27. Emanuel, D. M. (1989). Asset revaluations and share price revisions. *Journal of Business Finance & Accounting, 16*(2), 213-227.
28. Fama, E. (1998). Market efficiency, long-term returns and behavioral finance. *Journal of Financial Economics*, *49*, 283-306.
29. Gaeremynck, A., & Veugelers, R. (Spring 1999). The revaluation of assets as a signalling device: A theoretical and an empirical analysis. *Accounting and Business Research, 29*(2).
30. Griffiths, W. E., Hill, R. C., & Judge, G. G. (1993). *Learning and Practicing Econometrics*. New York etc.: Wiley.
31. Henderson, S., & Goodwin, J. (1992). The case against asset revaluations. *Abacus, 28*(1), 75-87.
32. Institute of Chartered Accountants of New Zealand (ICANZ) (2002). *Financial Reporting Standard No. 3: Accounting for Property, Plant and Equipment*. Wellington: ICANZ.
33. Jaggi, B., & Tsui, J. (2001). Management motivation and market assessment: Revaluations of fixed assets. *Journal of International Financial Management and Accounting, 12*(2), 160-187.
34. Lin, Y. C., & Peasnell, K. V. (2000a). Fixed asset revaluation and equity depletion in the UK. *Journal of Business Finance & Accounting, 27*(3-4), 359-394.
35. Lin, Y. N., & Peasnell, K. V. (2000b). Asset revaluation and current cost accounting: UK corporate disclosure decisions in 1983. *British Accounting Review, 32*, 161-187.

36. Missonier-Piera, F. (2007). Motives for fixed-asset revaluation: An empirical analysis with Swiss data. *International Journal of Accounting, 42*(2), 186-205.
37. Morse, D. (1984). An Econometric Analysis of the Choice of Daily Versus Monthly Returns in Tests of Information Content. *Journal of Accounting Research*, Autumn 1984, 605-623.
38. Myers, S., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, 13*(2), 187-221.
39. New Zealand Institute of Chartered Accountants (NZICA) (2004). *New Zealand Equivalent to International Accounting Standard 16: Property Plant and Equipment (NZ IAS 16).*Wellington: NZICA.
40. O'Hanlon, J. F., & Pope, P. F. (1999). The value-relevance of UK dirty surplus accounting flows. *The British Accounting Review, 31*(4), 459-482.
41. Oram, R. (2007, January 21). Could it be the year of the Kiwi?. *Sunday Star Times*, p. D2.
42. Perry, G. (1979). Trends in Australian strike activity: 1913-1978. *Australian Bulletin of Labour.*
43. Petty, J. W., Keown, A. J., Scott, D. F., & Martin, J. D. (1993). *Basic Financial Management* (6^{th} ed.). Prentice Hall.
44. Sharpe, I. G., & Walker, R. G. (1975). Asset revaluations and stock market prices. *Journal of Accounting Research, 13*(2), 293-310.
45. Shtatland, E.S., Moore, S.L. & Barton, M.B. (2000). Why we need an R_2 measure of fit (and not only one) in PROC LOGISTIC and PROC GENMOD. *SUGI 2000 Proceedings*, Cary, NC, SAS Institute Inc., 1338–1343
46. Standish, P., & Ung, S. (1982). Corporate signalling, asset revaluations and the stock prices of British companies. *Accounting Review, 57*(4), 701-715.
47. Stark, A. (1997). Linear Information, Dynamics, Dividend Irrelevance, Corporate Valuation and the Clean Surplus Relationship. *Accounting and Business Research*, December 1997, 219-28.
48. Strong, N. (1992) Modelling Abnormal Returns: A Review Article. *Journal Of Business Finance and Accounting*. Vol. 19(4), 533–553.

49. The Treasury. (2006). *Accounting Framework*. Retrieved October 10, 2006 from http://www.treasury.govt.nz/valuation/cultural/accountingframework.asp
50. Watts, R. L., & Zimmerman, J. L. (1978). Towards a positive theory of the determination of accounting standards. *The Accounting Review, 53*(1), 112-134.
51. Watts, R. L., & Zimmerman, J. L. (1990). Positive Accounting Theory: A ten year perspective. *Accounting Review*, January 1990, 131-156.
52. Westwood, M. (1995). *Financial Accounting in New Zealand* (2nd ed.). Longman Paul.
53. White, G. I., Sondhi, A. C., & Fried, D. (1998). *The Analysis and Use of Financial Statements* (2nd ed.). John Wiley & Sons, Canada.
54. Whittred, G., & Chan, Y. K. (1992). Asset revaluations and the mitigation of underinvestment. *Abacus, 28*(1), 58-74.
55. Whittred, G.., & Zimmer, I. (1986). Accounting Information in the Market for Debt. *Accounting and Finance*, November 1986, 1-12.
56. Wikipedia. (2006a). Fixed Asset. Retrieved September 16, 2006, from http://en.wikipedia.org/wiki/Fixed_asset
57. Wikipedia. (2006b). Revaluation of Fixed Asset. Retrieved September 16, 2006, from http://en.wikipedia.org/wiki/Revaluation_of_fixed_assets
58. Wong, J. (1988). Economic Incentives for the Voluntary Disclosure of Current Cost Financial Statements. *Journal of Accounting and Economics*, April 1998, 151-67.