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AN EXAMINATION OF THE ACCOUNTING  
TREATMENT AND VALUE RELEVANCE OF  
INTANGIBLE ASSETS  
IN  
PUBLICLY LISTED  
NEW ZEALAND COMPANIES

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## **Abstract**

With little current public information on intangible asset capitalisation in the New Zealand environment, this study uses companies listed on the New Zealand Stock Exchange to determine current practice. The purpose of the study is to provide a springboard for further research into the intangible area as well as providing an understanding of how New Zealand companies contend with intangible assets, in the light of the controversy that has surrounded the introduction of the exposure draft, ED-87 *Accounting for Intangible Assets*.

The study finds that, apart from goodwill, there are a variety of other intangible assets capitalised by New Zealand listed companies and that the majority of these assets are valued at cost. Capitalisation extends across most industry sectors and company size, although a higher proportion of larger than smaller companies capitalise intangible assets.

The contribution to asset value made by capitalisation is quite high for some companies, with intangible assets other than goodwill contributing a greater proportion to asset value than goodwill.

Although capitalising intangibles reduces the discrepancy between market and book values of equity, capitalising companies still have higher market-to-book ratios than non-capitalising companies, indicating that the market recognises further uncapitalised intangible value.

Whilst companies with higher debt levels have a greater tendency to be capitalising companies, there is no evidence to suggest that companies are capitalising simply because of leverage factors. However, with amortisation periods tending to longer rather than shorter time spans (with many companies not amortising at all), companies may well be using amortisation practices to maintain higher asset levels on the balance sheet.

The research supports overseas evidence for the value relevance of capitalised intangible assets and also finds that corporate ownership diversity and size can be influential in that value relevance.

## **Chapter One - Introduction**

### **1.1 – The New Zealand Regulatory Environment**

In April 1999 the Institute of Chartered Accountants of New Zealand (ICANZ) issued an exposure draft (ED) on accounting for intangible assets. Attempting to tackle an area that had already experienced an earlier failure in the New Zealand accounting arena, this new ED proved to be contentious from the outset. Based on the International Accounting Standard, IAS-38, ED-87 follows the same restrictive capitalisation conditions incorporated into the international standard, conditions which have been perceived as placing the emphasis on the reliable measurement of intangible assets whilst ignoring their relevance.

New Zealand's previous attempt at tackling the accounting treatment of intangibles<sup>1</sup> was with the issue of ED-43 *Accounting for Intangibles* in July 1988. ED-43 was an exposure draft concerned with goodwill, but it did extend to intangible assets generally. Following its withdrawal in May 1990 because of recognition that the international trend was towards a more conservative position than that adopted in the ED, New Zealand was left with the statement of standard accounting practice, SSAP-8 *Accounting for Business Combinations*, which covered the treatment of acquired goodwill. With the exception of development costs, addressed in SSAP-13 *Accounting for Research and Development Activities*, introduced in 1991<sup>2</sup>, the accounting treatment of other types of intangible assets was left open. So in the absence of regulatory requirements New Zealand companies have capitalised (disclosed on the balance sheet) intangible assets based on management discretion, and hence in New Zealand at present the treatment varies widely. Whilst some companies do not capitalise any intangible assets, others, such as Lion Nathan, have a considerable proportion of their total non-current asset value in intangibles. Whether these

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<sup>1</sup> Goodwill had first been considered in September 1980 when Ian Stewart wrote bulletin R112 *Accounting for Goodwill* and the issues he identified remain in contention today.

<sup>2</sup> SSAP-13 was replaced in 1995 by the financial reporting standard FRS-13 *Accounting for Research and Development Activities*.

assets are reported at cost or value also varies and the adoption of fair value reporting for non-current assets has meant that some companies use fair value for capitalised intangibles. It is therefore apparent that ED-87, if adopted as a standard, could make a significant difference to the reported asset values in some New Zealand companies.

In the feedback on ED-87 provided to ICANZ, opposition to its adoption as a standard was strong, with the most significant issues identified by respondents being the recognition criteria for intangible assets along with concerns over revaluation and amortization (Russell-Green, 2000). ED-87 allows recognition of intangible assets only if they have a cost that can be reliably measured and as such rules out any recognition of internally generated assets. Opposition to this and to the requirement that revaluation of an intangible asset should only occur with reference to an active market was clearly evidenced in the feedback reported by Russell-Green (2000).

ED-87 is much more restrictive than ED-43, which allowed for specific recognition of internally generated identifiable intangible assets, initially at cost. This aspect of ED-43 and the fact that it allowed revaluations within prescribed guidelines for each class of intangible asset probably explains treatment by companies such as Lion Nathan, which first capitalised its brands in its 1989 balance sheet using a valuation by Interbrand (Godfrey, 1993).

The feedback to ED-87 also showed disagreement over the rebuttable presumption that the useful life of an intangible asset would not exceed 20 years, with respondents feeling that many intangible assets have lives well beyond 20 years and some do not wear out at all (Russell-Green, 2000).

Much research has been carried out on the intangible asset area internationally but to date there has been only limited research in the New Zealand market.<sup>3</sup>

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<sup>3</sup>In 1992 Andy Godfrey (Manukau Polytechnic) undertook a questionnaire survey of 89 organisations to establish the nature and extent of brand valuation activity in New Zealand.

Based on intangible asset studies from outside New Zealand, the research in this thesis proposes to investigate aspects of intangible asset capitalisation in the New Zealand corporate market with the hope that the findings will contribute new knowledge on intangible assets in this environment.

## **1.2 – Aim of the Research**

Using companies listed on the New Zealand Stock Exchange (NZSE), the broad aim of the research is to determine the variety of intangible assets capitalised by NZSE-listed companies, how those assets are valued, the effect of capitalising on the reported value of assets as well as the effect capitalising might have on the market value of the assets. In addition any connections between the capitalising of intangible assets and the level of debt are explored as well as connections between level of capitalising and industry sector, corporate size and ownership structure, the latter two being aspects that contribute to information asymmetry.

## **1.3 – Data and Limitations**

The research uses companies listed on the New Zealand Stock Exchange as at September 2000. In many other countries where similar research is conducted, the information is available on corporate databases. However this is not the case in New Zealand and therefore the necessary information is gathered manually. The corporate financial information comes from each company's annual report for its financial year ending in 2000, and the share price data comes from Datex CD-ROM files.

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<sup>3cont'd</sup>In 1995 Dot Cochrane (The University of Waikato) completed a PhD thesis with The University of Auckland, examining disclosure of intangible asset information in the annual reports of 82 companies listed on the New Zealand Stock Exchange for the period January 1987 to December 1992.

In 1999 and 1995 Hamish Anderson (Massey University) published research on R&D expenditure and capitalisation in the 1997 and 1992-94 periods.

As the research is confined to companies listed on the New Zealand Stock Exchange in a particular financial year, the database is not large compared to listings in other countries or research carried out over an extensive time period. There is an advantage in capturing a reasonably complete market but a disadvantage in that the size might lead to a lack of diversity in findings and also the possibility that the findings in the particular year selected might not be typical of other years.

However, the manual nature of the data collection limited the size of the study with the choice of year determined by currency - at the commencement of the research the most current information was for the 2000 year. Despite the possible limitations, it is hoped that the findings of this study will provide a base for future comparative and extension studies.

Finally, the focus of the study is confined to balance sheet disclosure of intangible assets and although other forms of disclosure are referred to, these aspects are not specifically explored. In addition the area of intangible liabilities is not explored. These are limitations of the study and possible areas for future investigation.

#### **1.4 - Terminology**

Throughout the thesis the term 'capitalising' is used to refer to companies that disclose intangible assets on the face of the balance sheet, hence companies that do this are referred to as 'capitalising companies' and those that do not as 'non-capitalising companies'.

## **1.5 – Thesis Outline**

The thesis is divided into eight further chapters. A brief description of each follows.

Chapter Two gives some background information, covering initially what constitutes an intangible asset and then examining the international interest in intangible assets from both a regulatory and general accounting perspective.

Chapter Three comprises a literature review relating to the various aspects of intangible asset capitalisation that are considered in the research and in addition develops the three main objectives of the research.

Chapters Four to Eight cover the methodology and findings for the three objectives, commencing in Chapter Four with a descriptive overview of capitalisation practices by the NZSE-listed companies used in the research.

In Chapter Five the possibility of a relationship between capitalisation practices and debt levels is explored.

Chapters Six to Eight cover the investigation into the value relevance of capitalised intangible assets commencing with the associations between book and market value in Chapter Six, using regression modelling to test relevance in Chapter Seven and then testing for the influence of various factors on that value relevance in Chapter Eight.

Chapter Nine summarises the findings, discussing the limitations and giving suggestions for further research.

## ***Chapter Two - Background***

### **2.1 – Types of Intangible Assets**

Of importance initially is to define what is meant by the term 'intangible asset'. Lev (2001) describes an intangible asset as a claim to future benefits without physical or financial embodiment. Cesta and Davis (1996) provide a good (but probably by no means exhaustive) list of what can be included:

- ◆ Specialized knowledge (such as manufacturing processes and engineering drawings)
- ◆ Customer information (such as customer lists and mailing lists)
- ◆ Contracts (such as favourable supplier contracts and non-complete covenants)
- ◆ Data processing (such as computer software)
- ◆ Human resources (such as trained and assembled work force)
- ◆ Marketing/advertising (such as franchises, trademarks, and trade names)
- ◆ Locations (such as leasehold interests)
- ◆ Goodwill (such as going-concern value)
- ◆ Rights in the products of creativity (such as copyrights)
- ◆ Rights in innovations (such as patents)
- ◆ Legal items (such as licenses, permits, or rights granted by governmental agencies).

From an accounting context (i.e. through various national standards) Brennan and Connell (2000) feel that intangible assets are defined very narrowly but that in the knowledge management field the term 'intangible asset' is understood in a broader context. Definitions may not include assets such as human resources, customer loyalty and company reputation, all of which have huge potential to create value. As a consequence the term 'intellectual capital' is often used to

cover these aspects, but this term can also be used as synonymous with total intangible asset value (Joia, 2000).

Karl-Erik Sveiby, a pioneer in intellectual capital management, developed an intangible asset monitor, classifying intellectual capital into three broad classification categories – structural, customer and human capital (sometimes referred to as internal, external and employee capital). These categorisations cover all intangible assets (excluding what is traditionally recognised simply as goodwill) as follows:

- Internal (organisational and structural) capital covering intellectual property (patents, copyrights, trademarks) and infrastructure assets (corporate culture, management processes, information systems etc.);
- External (customer and relational) capital (brands, customers, company names, brands, licensing agreements franchises etc.); and
- Employee capital (human capital covering knowledge, education, qualifications, competencies etc.) (Guthrie, 2001).

Caddy (2000) goes further and states that intellectual capital consists of a mix of both intellectual assets and liabilities where intellectual assets are differentiated from intangible assets based on the degree of difficulty in determining value.

With this diversity in understanding, for the purposes of this research, when the term 'intellectual capital' is used, it is synonymous with intangible assets, other than goodwill, unless otherwise stated.

## **2.2 – Regulatory Interest in Intangible Assets**

Intangible assets continue to be a subject of debate internationally and in fact have been recognised as one of the most controversial accounting standard-setting issues in the world (Godfrey and Koh, 2001). How to define intangible assets, whether they should be capitalised and if so, amortised, as well as what to do about internally generated intangible assets, are all questions that have perplexed the international accounting world for some considerable time. Lack of

consensus on the issues and the consequent lack of regulation has resulted in diversity in the ways companies account for intangibles.

Of particular interest is what has happened in Australia and the United Kingdom (UK), because companies in both these countries have been capitalising identifiable intangible assets in addition to goodwill for some time. Also, the stance taken internationally by the International Accounting Standards Board (IASB), and in the United States (US) by the Financial Accounting Standards Board (FASB), is of interest because of their influence on the international arena. Although endorsement for harmonisation with international accounting standards grows<sup>4</sup> the North Americans still favour following US GAAP (Generally Accepted Accounting Practice) and the US is still influential on the accounting world stage.

In Australia, tackling the intangible area has had a chequered history. In 1989 the Australian Accounting Research Foundation (AARF) issued ED 49, an exposure draft on accounting for identifiable intangible assets, excluding goodwill. From 1984 goodwill accounting had been covered with the issue of the accounting standard, AAS 18 *Accounting for Goodwill*, to be followed in 1988 by the Australian Accounting Standards Board (AASB) standard, AASB 1013 *Accounting for Goodwill*, a standard which had statutory backing.

The main problem with the implementation of the goodwill standard was the requirement to amortise goodwill over a period not exceeding 20 years, and it was found that many companies, in seeking to minimise the impact of this requirement, sought to reduce the amount recorded as goodwill by recognising identifiable intangible assets. Despite the expectation that these assets would be treated as any other non-current assets and be written off systematically, there was widespread non-compliance. Whilst the percentage of companies adopting a systematic amortisation policy for identifiable intangibles decreased, there was a corresponding increase in the percentage electing not to amortise them, the

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<sup>4</sup> The International Organisation of Securities Commissions (IOSCO) endorsed international accounting standards in May 2000; the European Commission has required all listed EU companies to prepare consolidated financial statements in accordance with IASs from 2005; the AASB is requiring harmonisation with IASs by 2005.

concluded purpose being to reduce the impact of amortised goodwill on reported profits (Wines and Ferguson, 1993). As a consequence ED 49 was issued to deal specifically with the treatment of identifiable intangibles and was designed to complement AASB 1013.

ED 49 not only introduced recognition requirements for purchased identifiable intangibles but also requirements for companies to account for internally developed identifiable intangibles by facilitating their recognition at development cost or through an independent valuation of current acquisition cost (Gerhardy and Wyatt, 2001). However, the ED caused considerable controversy and was subsequently withdrawn in 1992 due to a lack of resolution, primarily over whether all intangible assets have finite lives (and hence the need for write-off over a 20 year maximum period) as well as the reliability of values, especially for intangible assets that had been revalued (Alfredson, 2001). The AASB felt at that time that they should await international developments before tackling the subject again. In the meantime Australia was left with asymmetry in the regulation of goodwill and other identifiable intangible assets, particularly in the area of amortisation. Although hoping to resolve this with the issue in 1998 of AASB 1021 *Depreciation*, which includes intangible assets as a class of non-current depreciable assets, it was found that Australian companies still tended to avoid amortising these assets (McCahey, 1999).

The United Kingdom was the next to tackle the subject when, in December 1997, the Accounting Standards Board (ASB) issued Financial Reporting Standard, FRS 10 *Goodwill and Intangible Assets*, a standard that made significant changes to current practice. FRS 10 permits recognition of intangible assets, separate from goodwill, where they are identifiable and capable of reliable measurement. It also allows impairment at the end of each reporting period for both goodwill and/or intangible assets with indefinite economic lives, whilst those with limited economic lives should be amortised systematically, subject to a rebuttable presumption, over a maximum of 20 years. The recognition of a possible indefinite life for both goodwill and intangible assets, albeit based on certain criteria, is significant. The standard also allows recognition for internally generated intangible assets if there is a readily ascertainable market value,

although the absence of such values makes recognition of these assets more difficult.

Compared to FRS 10, the international standard, IAS 38 *Intangible Assets*, issued by the IASB in July 1998, seemed a backward step when it appeared. It does not adopt the indefinite life provision, stating a rebuttable presumption that the useful life would not exceed 20 years (and then only rebuttable in rare cases). Recognition of intangible assets is based on reliable measurement and the flow of future economic benefits and revaluation is only permitted with reference to an active market. If meeting strict criteria, internally generated intangible assets can be recognised, but there is a strict prohibition on recognition of internally generated brands, mastheads, publishing titles, customer lists and similar items.

In fact IAS 38 has made the standardisation of accounting treatment for intangible assets more difficult for countries like Australia and New Zealand. The approach adopted by FRS 10 was closer to meeting the criticisms against both ED 49 and ED 87 and if the IASB had taken a similar stance it might have made progress on standardisation in each country easier.

In the United States treatment of intangibles has been very conservative due to measurement reliability issues. Traditionally, capitalisation of internally generated assets has been forbidden (with the exception of technology based assets such as software) and historic cost measurement has prevailed over value. However, adding further confusion to the issue, in July 2001 the FASB issued two new Statements of Financial Accounting Standards (SFAS), SFAS141 *Business Combinations* and SFAS 142 *Goodwill and Other Intangible Assets*. Under SFAS 141 intangible assets, other than goodwill acquired in a business combination, are required to be recognised separately if arising from contractual or legal rights, regardless of whether these rights are transferable or separable. Assets able to be recognised include tradenames, licenses, customer lists, customer contracts, non-contractual customer relationships and order and production backlog. SFAS 142 actually prohibits the amortisation of goodwill, introducing instead a two-step impairment test to help ensure that the carrying value of goodwill is not stated in excess of its implied fair value. Where identifiable intangible assets have

indefinite lives the standard specifies an impairment-only approach. From the perspective of international harmony this move has not helped, although Charles (2002) states that Australian and international accounting standards are likely to align with American standards. There is in fact an expectation that both the IASB and the AASB will issue exposure drafts in late 2002 (Donnelly and Keys, 2002), but only time will tell.

As Stolowy and Jeny-Cazavan (2001) point out, the case of intangibles is one of international accounting disharmony. In their study of 23 national and international<sup>5</sup> accounting standards on intangibles they find wide disparity in both definitions and treatment and conclude that the lack of international homogeneity on this issue probably arises out of a lack of national homogeneity.

Whilst consistency in the accounting treatment of intangible assets remains an ongoing debate, the question could be asked: why there is such a focus (and not just from the accounting profession) on intangible assets?

### **2.3 - General interest in Intangible Assets**

The 'new economy' has been a name used by many to distinguish the economy of the 21<sup>st</sup> century from the economy of 50 years ago, with the economy today dominated by different value drivers, a key one being intangibles (Cheney, 2001; Jenkins and Upton, 2001). It is this factor of value that has driven the increasing focus on intangible assets.

Literature over the past few years on the topic seems to be in no doubt about the importance of intangible assets in corporate value. In a Financial Executives Institute teleconference, Baruch Lev, New York University Stern School of Business Accounting and Finance Chairman, says that intangibles can account for as much as 85 percent of a company's perceived value (Companies may be..., 2000). Lev and Zarowin (1999) refer to investments in intangibles, such as

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<sup>5</sup> 15 EU countries, six others (Australia, USA, Canada, Japan, Norway and Switzerland) and, as international standard setters, the IASC and the European Union.

research and development (R&D), information technology, brands and human resources, as innovative activities and the major initiator of change in developed economies but state that the most serious failure in the present system is in the accounting for intangibles which does not reflect enterprise value and performance.

Gaum, Ittner, Larcker, Low, Siesfeld and Malone (2000), in reporting on the formation of a Value Creation Index for the measurement of intangible assets, feel that the current system of financial measurement has become increasingly disconnected from what is truly valuable in the new economy, namely intangible assets. Intangible assets, they state, make up a "huge portion" of a company's value and are remeasured daily by analysts and traders. They are of national importance not only because nearly all the value of the "hottest" companies is attributed to intangibles, but these assets might well represent as much as half the value of the entire US economy (Gaum et al., 2000).

Observing the increased discrepancy between the accounting book value of a company and its market capitalisation value, many attribute this difference to intangibles. David Wheeler, the Professor of Business and Sustainability at York University in Toronto, when referring to the way intangible assets have outstripped conventional assets, even before the e-commerce revolution, states that between 1990 and 1995, the ratio of market to book values increased from an average of 149 percent to 202 percent in Europe and from 194 percent to 296 percent in the United States (Watts, 2000).

With the perception of this gap created by intangible value, their lack of recognition in traditional financial measurement has been a concern. Referring to intangible assets such as Merck's breakthrough drug products and Coca-Cola's trademark, Wallman (1995) says that this group of assets is the fastest growing and constitutes the most important part of new firms. They are in fact significant building blocks, but the inability to recognise them on the balance sheet means that balance sheets bear little resemblance to the true financial position. David Larcker, professor of accounting at The Wharton School, the University of Pennsylvania's business school, comments on the fact that people are starting to

wonder if the accounting system that has served its purpose well for 500 years has become obsolete (Schwartz, 2000). Traditional accounting is tied to bricks-and-mortar assets and to a 'what happened' mentality but in many of the newer companies investors are interested more in people or ideas than previous performance (Schwartz, 2000).

In response to the concern over the disparity between corporate book and market value, Jenkins and Upton (2001) examine the purpose of financial reporting and challenge the ability of the financial statements to represent real worth. They state that measurement at current value of a company's net assets would never equal market capitalisation and that the purpose of financial reporting is to provide information about economic resources to investors and creditors as a feedback mechanism, confirming or correcting prior expectations. Therefore there should not be an expectation of equivalency between book value and market capitalisation. Quick (2002) expresses concern that the inclusion of intangibles on the balance sheet could lead to the possibility of large swings in asset value from year to year with massive write-offs from profit, making a nonsense of the financial statements. Also, if intangible value is determined by the difference between market and book value, the fluctuation of share prices means the value of intangibles is being constantly distorted (Brennan and Connell, 2000).

Yet the discrepancy remains between acknowledging the value of intangibles, which for many in the market place is indisputable, and actually capitalising that value, and there is an expectation that somehow this needs to be resolved. According to John Allert, chief executive of Interbrand (an international brand-valuation company), it is a question of measurement and accountability. The world of finance is finally starting to respect the power of intangibles and, having got that far, now wants to quantify and measure them and make people accountable (Charles, 2002).

At present, with the conflict in accounting circles, other steps are being taken to try to meet the need for information not provided by financial statements. In the US, the FASB is considering introducing compulsory disclosure about the value

of its intangibles in company financial statements and in the UK the ASB's latest proposals for an updated Operating and Financial Review (OFR), published in June 2002, include a new recommendation that directors discuss the strengths and resources of the organisation, such as brand equity, market dominance or product research. In addition, talking about how the organisation is working towards enhancing its future performance through areas such as human capital management and customer support is suggested. ASB chairman, Mary Keegan, states that, for investors, financial statements are only part of the information needed to assess an investment's potential (Quick, 2002). Power (2001) believes that the OFR move reflects an aspiration to understand and report on *causes* of value, rather than to record financial outcomes.

Some organisations have been considering disclosures about sources of value for some time and endeavours to include intellectual capital indicators in annual reporting dates back to the early 1990s (Guthrie, 2001) with the Swedish insurance company, Skandia, being recognised as a leader in intellectual capital reporting (although on the face of the company's balance sheet only acquired goodwill is capitalised).

However, currently such reporting lacks uniformity and consistency as discovered by Guthrie and Petty (2000) who did a content analysis study of the top 20 Australian listed companies using 1998 annual reports. They indicate that in recognition of the fact that over the previous 20 years intangible assets have taken the place of fixed assets as the economic drivers, they expected to find significant evidence of a commitment to the development and management of intangibles reflected in those reports. What they did find, though, is that there is no discernible pattern to reporting, 95 percent of which is in written or discursive form, with a wide coverage but lacking depth. The study was replicated on Irish companies and although there are differences in the frequency of reporting for different intellectual capital indicators, the findings are similar with respect to the lack of a consistent reporting framework (Brennan and Connell, 2000).

Whilst there is some movement in the direction of recognition of intangible value, there are many who feel that if information is restricted to narrative disclosures,

this will be insufficient. Lev (2001) suggests starting with a voluntary, yet well defined and structured, reporting system (such as the value chain scoreboard) but believes that there is also a need for a significant change in the current accounting system (to at least enable recognition of all intangible investments with attributable benefits<sup>6</sup>). However, as this latter aspect would involve regulatory intervention, probably resulting in antagonism from both managers and accountants, Lev (2001) sees an advantage in both groups initially gaining experience with disclosure of intangibles-related information and therefore coming to appreciate its success in the marketplace.

Set against a background of diversity amongst standard setters and those who utilise those standards; the recognition of the importance of intangible assets as value drivers in the new economy but the problems in accounting for these assets; this study seeks to explore previous work on intangible assets and then examine the topic in the New Zealand reporting environment.

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<sup>6</sup> Lev (2001) proposes that these intangible benefits would be recognised if they passed certain prespecified technological feasibility tests.

## ***Chapter Three - Literature Review and Objectives of Current Research***

### **3.1 – Capitalisation of Intangible Assets**

In the history of capitalising intangible assets, goodwill on acquisition has had a relatively long history; but what about capitalisation of other intangible assets?

In the international arena, although dependent on each country's accounting regulatory requirements, there are a wide variety of intangible assets capitalised. Australian companies have a relatively well-documented capitalisation history, and being closest to New Zealand (physically and in terms of commonality in the intangible asset area) are useful for comparative purposes. Australian companies capitalise a diversity of intangible assets, as shown in findings covering various time intervals between 1985 and 1999 (for example Goodwin and Harris, 1991; Wines and Ferguson, 1993; Wyatt, Matolcsy and Stokes, 2001; and Godfrey and Koh, 2001). Throughout this time period, brands, trademarks and patents are the most commonly capitalised intangibles, but in addition to these very material valuations have been recognised in corporate financial statements for intellectual property rights and licences related to television, radio, and wagering and gaming (Miller and Loftus, 2000).

From a survey by Ernst & Young in 1998 of 181 listed Australian companies Ravlic (2000a) reports that the value of intangibles on the books totalled Aus\$59.9 billion, of which about Aus\$43.5 billion was made up of intangible assets other than goodwill, and Aus\$39.7 billion of that was unamortised. If these unamortised assets were amortised using a straight-line method over a 20-year period, this would represent almost \$2 billion a year on the income statements of the combined companies (Ravlic, 2000a). Although this lack of amortisation is not a new problem, renewed concern was expressed by the Australian Securities and Investments Commission (ASIC). Despite a prevailing argument that assets such as mastheads, brand names and similar identifiable

intangible assets have an indeterminate useful life and therefore should not be amortised, the ASIC Chairman points out that very few intangible assets last for long periods and brands such as Coca-Cola and Johnnie Walker are the exception rather than the rule (Ravlic, 2000b). (It is interesting to note that Coca-Cola's brand, valued at US\$83.8 billion in 1999 by Interbrand, is an example of an intangible asset that is well acknowledged but does not appear on the balance sheet.)

Brands are certainly regarded as one of the major intangible asset items. Since the 1960s brands have been an intangible asset seen by American and British packaged goods companies as being key contributors to sustained demand for their products (McIntyre, 2000), probably the case in many similar companies internationally. In addition they seem to give a return on investment as Charles (2002), citing findings from a US research report by Madden, Fehle and Fournier (2002), states that an investment of US\$1,000 in the 111 strong-brand companies in August 1994 would have more than quadrupled by December 2000 into US\$4,525, whereas the same amount invested in the overall stock market would have returned US\$3,195.

David Wheeler has said that brands would be key sources of competitive advantage for successful organisations in the future, just as access to production facilities, capital and raw materials were in the past (Watts, 2000). Accountants are not slow to recognise this – PricewaterhouseCoopers (PwC) Consulting recently spent £75 million on its new name, 'Monday' (Quick, 2002).

The importance placed on brands is reflected in the amount of work brand valuation companies such as Interbrand and Brand Finance have, but David Haigh, the chief executive of Brand Finance, lamented the fact that although brands are known to be valuable, there is a problem in how to reflect that value in financial statements (McIntyre, 2000). Herremans, Ryans Jr. and Aggarwal (2000) see the need for some credible disclosure of brand values following The Conference Board (a highly respected New York corporate research organisation) stating that there is a need to develop appropriate disclosure procedures to allow stock price to reflect the value of a company's intangible assets.

At present brand valuations are reflected as either on or off-balance sheet items, with no consistency, although Herremans et al. (2000) point out that in the UK brand value reporting (and capitalisation) is very much more common than in the US (due to FRS 10's allowance of the recognition of internally generated intangible assets if they have a readily ascertainable market value). According to a UK survey by Brand Finance in 2001 financial analysts want information on brand values, with the survey findings showing that 76 percent of analysts want more information on brand values and 68 percent more information on intangible assets (Charles, 2002). In the same survey there is strong support for capitalisation of intangible assets with 82 percent support, and as much as 56 percent support for capitalisation of internally generated intangibles.

Another intangible asset commonly capitalised is a patent. With the control over intellectual property becoming key to success, patents are being considered a business tool (Parker, 2002). With the ability to patent new business processes and methods, such as Amazon.com's online sales system, whose patent was successfully defended in court, their importance is increasing. Patents can also generate a large amount of revenue – IBM earns US\$1.5 billion annually from royalties and licence fees purely from the patents it holds. There is no doubt that for some organisations the value of the patent far exceeds its cost.

Intangible assets such as patents and licences, because they are external and usually have a recognised cost, are not uncommon in intangible asset capitalisation internationally. In Scandinavian countries (Norway, Denmark and Sweden) for example, in addition to categories for development costs and goodwill, there is a recognised category comprised of concessions, patents, licences, trademarks and similar rights (Hoegh-Krohn and Knivsfla, 2000).

Development costs are probably the other most commonly capitalised type of intangible asset. Investment in R&D is a major productive input for many companies, but in most cases disclosure about this productivity and the value of R&D activities in corporate annual reports is deficient compared to the disclosure of tangible and financial assets (Aboody and Lev, 2000). The privacy surrounding R&D activities means it continues to be an area of great interest,

particularly from the aspect of information asymmetry. For example R&D intensive companies are found to have higher analyst coverage (Barth, Kasznik and McNichols, 2001) and are also found to have larger insider gains (Aboody and Lev, 2000) resulting in a stronger investor reaction implying larger information asymmetry. Capitalising development costs, once products successfully pass technological feasibility tests, is seen as a way of mitigating this information asymmetry (Aboody and Lev, 1998). This is supported by Smith, Percy and Richardson (2001) who find that for Australian and Canadian companies discretionary capitalisation of development costs results in a balance sheet that is more highly associated with market value.

Although there is little published history of the treatment of intangible assets by companies in New Zealand, Cochrane (1994), reporting on her research into NZSE-listed companies in the 1987 to 1992 period, finds that the two intangible asset groups most often differentiated from goodwill are brands and publishing titles (including mastheads). In this time period five out of the 82 companies included in the research made at least one policy statement concerning brands and two published policy statements concerning publishing titles. By 1994 five of these companies continued to show consistent patterns of disclosures in their audited financial statements and one other company disclosed brand values in notes appended to the financial statements.

In a survey on brand valuations amongst New Zealand companies in 1992 Godfrey (1993) finds that 16 out of 63 companies have valued brands, 11 valuing various combinations of all or some of their acquired brands and 12 valuing some or all of their internally developed brands. Thirteen of the 16 companies expected to use the valuations for financial reporting purposes but the number of companies actually capitalising these brand values at the time is not reported.

Some investigation into R&D has also been carried out, with Anderson (1995) investigating 52 NZSE-listed companies for financial and non-financial disclosures in the period 1992 to 1994, when only four companies capitalised development costs. In a further study on 137 companies in the 1997 year, this number had increased by just two, to six companies (Anderson, 1999).

### **3.2 - Development of the First Objective**

At present in New Zealand it is acknowledged that there are a variety of intangible assets being capitalised, but there is little detailed information about this capitalisation. The first objective of this research is to determine the diversity of what is being capitalised over type and industry, the contribution capitalisation makes to asset value, whether these assets are capitalised at acquisition cost (as would be expected for goodwill) or at value, and if so, how that value is determined. Also investigated is whether companies amortise the intangible assets they capitalise (and if so, how).

Objective One is stated as:

*To determine the type of intangible assets capitalised by New Zealand companies, the diversity of capitalisation over company size and industry sector, the value of those assets and their contribution to total and non-current asset value, how their value is determined and whether they are being amortised.*

### **3.3 - Capitalisation and Level of Debt**

Asset value is important in financial analysis. Net assets are used in financial ratios with the long-term debt to book value of assets providing the most stable measure of a firm's capital structure (Wald, 1999). Ratios such as these are used by investment analysts for corporate performance measures. Bank loans rely on reported leverage ratios calculated using reported net assets to determine closeness to debt covenants and creditworthiness. Firms raising equity or renegotiating debt also have incentives to report stronger financial positions to obtain more favourable equity pricing or loan terms.

Regulatory bodies evaluating corporate acquisitions and disposals are also interested in ratios. Muller III (1999) finds that UK firms capitalise brands (separately from goodwill) as a contracting cost incentive, increasing asset value to reduce the cost of seeking London Stock Exchange mandated shareholder approval for future acquisitions and disposals. Hence the recognition of

estimates of brand value is positively correlated with reported leverage. This finding supports earlier work by Mather and Peasnell (1991) who find that companies capitalising their brands have higher gearing ratios than other similar companies, especially amongst the recent adopters of capitalisation.

Debt may act as a motivation to revalue assets. Easton, Eddey and Harris (1993) find that in interviews with chief financial officers of Australian firms 40 percent indicated the need to lower the debt-to-equity ratio as a major reason for choosing to revalue assets. Aboody, Barth and Kasznik (1999) find that upward revaluations of fixed assets in UK firms are significantly positively related to changes in future performance (measured by operating income and cash from operations) but these relations are weaker for higher debt-to-equity ratio firms, so how these revaluations reflect asset value changes depends on the motivation to revalue. Lin and Peasnell (2000) find that equity depletion is strongly associated with upward revaluation. Hence the need to keep asset value high to counteract the effect of increased debt on the balance sheet is highlighted in this research.

One way of increasing asset value might be through capitalising intangibles and then prolonging their value on the balance sheet through extended periods of amortisation. Leverage is associated with some corporate policy choices (Smith and Watts, 1992; Gaver and Gaver, 1993) so might well be associated with amortisation policies.

Although assuming companies may want to capitalise intangibles to assist leverage constraints, this may not always be the case. Wong and Wong (2001) find a negative relation between acquired goodwill and leverage, interpreted as allocation of a lower portion of acquisition cost to goodwill and a higher portion to tangible assets, as a result of high leverage and the possibility of infringing leverage constraints. If a company understates the value of tangible assets in the allocation, this can mean the level of debt available to a company is less than the optimal amount (or interest rates higher or debt covenants more restrictive than necessary) (Wong and Wong, 2001).

Myers (2001), however, associates capitalised intangibles with low debt ratios. This is because companies with relatively safe tangible assets tend to borrow more than companies with risky intangible assets on the basis that intangible assets are more likely to sustain damage if financial distress is encountered. Highly leveraged companies can be placed in a difficult situation and in cutting back expenditure, areas such as R&D, advertising and training are targeted, resulting in loss in intangible benefits, ultimately reducing profits and equity, so too much debt can destroy value (Barclay and Smith, Jr., 1999).

### **3.4 – Development of the Second Objective**

Capitalising intangible assets can improve debt-to-equity ratios and these ratios can be maintained by keeping those asset values on the balance sheet through extended periods of amortisation, or not amortising at all. Whether leverage factors might be influential in either capitalisation or the amortisation period chosen for capitalised intangible assets for NZSE-listed companies is an aspect of investigation in this research.

Objective Two is stated as:

*To determine whether intangible asset capitalisation and associated amortisation periods are related to the level of debt.*

### **3.5 – The Value Relevance of Intangible Assets**

When shares are traded, the market price summarises the investors' expectations of value. Value relevance relates to the ability of information in financial statements to confirm or change these value expectations. It can be measured by associating market price with accounting numbers – something initiated by Ball and Brown (1968) and used in many studies since.

Over the past decade there have been a number of empirical studies that have documented that the value relevance of accounting has been decreasing, with

accounting numbers less able to explain variations in stock prices. Francis and Schipper (1999), Lev and Zarowin (1999) and Amir and Lev (1996) have investigated this assertion from different perspectives and found some support for the suggestion that there has been a decline in relevance in some areas.

Yet despite recognising that the significance of intangible assets could be much greater than that of tangible assets and that they should be both measured and reported because of information relevance to users of financial information, Dyckman and Zeff (2000) point out that there is an uncertainty with intangible values, which can be subject to dramatic change and cite the plummet in value of the tobacco brand, Marlboro. In a single day (April 2 1993) Phillip Morris suffered a loss in share value of \$13 billion, attributable to a sudden reduction in the value of the Marlboro brand. It came as a result of a price slash on Marlboro cigarettes; a move designed to compete with generic discount cigarettes. So dramatic was the effect that the day came to be known on Wall Street as 'Marlboro Friday'.

Even measured conservatively, intangibles can have value problems such as in the Burns Philp case, which resulted in massive write-downs in value (Rainsbury and Bennett, 2000).

Set against this, however, is the fact that the relevance of financial statements has been increasingly questioned, particularly from an investor's perspective. Investigations into the relevance of the two main accounting numbers, income and asset value, give mixed results. In investigating whether there is any change in the value relevance of book values over similar 40 year periods, Collins, Maydew and Weiss (1997) and Francis and Schipper (1999) find the value relevance of book values increases, whereas income figures decrease. However Brown, Lo and Lys (1999) dispute these findings, attributing them to the use made of  $R^2$ , which they claim as an unreliable statistic in the presence of scale. Rerunning the studies by both Collins et al. (1997) and Francis and Schipper (1999), after controlling for scale effects, they find that value relevance of book values has in fact declined significantly.

Francis and Schipper (1999) did find, however, that there is some evidence to suggest that balance sheet information explains a significantly higher portion of the variability in prices for low-technology firms than for high-technology firms. The high and low technology samples differ primarily in the extent of unrecorded intangible assets, suggesting that the prices reflect the market value of these unrecorded assets.

Amir and Lev (1996) find that financial accounting information is of limited value to investors in the valuation of companies that are intangible-intensive (service and technology-based companies which invested in intangibles such as R&D, human capital and brand development). However, Collins et al. (1997) find that the overall explanatory power of earnings and book values is slightly higher for intangible-intensive firms than for non-intensive firms, but offer no explanation for this finding, although, as stated above, these results have been questioned. Goodwin (2001) also finds on investigating the value relevance of earnings that intangible-capitalising firms give more relevant information for investors than for non-intangible-intensive firms, but does not identify the cause(s).

Lev and Zarowin (1999) find a decrease in the usefulness of financial information to investors over a 20 year period, focusing on intangible investments as the change-driver which has brought about a loss of value relevance of financial information. As a result they feel that there should be a comprehensive capitalisation of intangible investments as well as a systematic restatement of financial reports. Curtis (2000) goes further to suggest that as financial reporting needs disclosures that will lead to more relevant information there should be a new section in the annual report headed "Experimental Disclosures".

Despite the mixed outcomes from various studies, for many the perceived lack of relevancy of financial statements has been attributable to the lack of intangible asset capitalisation. Barth (2000), in response to the requirement that assets be capable of separation from their owners (appearing in most traditional asset definitions and hence excluding some intangible assets), asks whether this is sufficient to warrant non-recognition of a company's income generating base.

That income generating base is often connected to brands, and Stewart (1995) claims that as brands confer economic benefits such as pricing power, distribution reach and the improved ability to launch new products such as line extensions, this gives their owners a higher return on assets than unbranded competitors. In fact Aaker and Jacobsen (1994) find that there is a positive association between stock returns and *perceived* brand quality (after controlling for unexpected accounting returns) suggesting that even perception of intangible value is value relevant. Ittner and Larcker (1998) extend on this linking customer satisfaction (seen as a nonfinancial indicator of investments in intangibles) with incremental information for explaining differences in equity market value (after controlling for balance sheet information).

As some companies internationally are disclosing but not capitalising intangible assets it is worth noting that the difference between the two is seen as significant. The FASB contend that footnote disclosures are not adequate substitutes for recognising accounting information and Davis-Friday, Folami, Liu and Mittelstaedt (1996) find some support for this. However, as a caution, Bernard and Schipper (1994) (as cited in Davis-Friday et al., 1996) point out that if investors undervalue disclosed amounts, or greater relevance or reliability is put on capitalisation, then different stock price effects can result from capitalisation or disclosure.

Lev and Zarowin (1999) feel it is not unreasonable to assume that capitalisation of intangibles will improve the alignment of book values with intrinsic values. Abrahams and Sidhu (1998) find that capitalised R&D values on the balance sheets of Australian companies are significantly associated with market values and Lev and Sougiannis (1999) find that off-balance sheet investment in R&D is seen to be proxied in the market-to-book ratios. Aboody and Lev (1998), in their study on capitalised software (one intangible exception to the immediate expensing of R&D required in the US), find a significant association between the cumulative software asset reported on the balance sheet and stock prices. Canibano, Garcia-Ayuso and Sanchez (2000) comment that there is a bias in accounting research towards the analysis of the value relevance of R&D (and advertising) to the detriment of other intangible assets, and this may be true of American studies, but a wider interest is visible from elsewhere in the world.

Studies by Amir, Harris, and Venuti (1993), Chauvin and Hirschey (1994) and McCarthy and Schneider (1995) report a significant positive relationship between goodwill and the market value of a firm. Jennings, Robinson, Thompson II and Duvall (1996) empirically investigate the relationship between market equity values and purchased goodwill and find a strong positive cross-sectional association between equity values and recorded goodwill asset amounts, after controlling for other components of net assets. Choi, Kwon and Lobo (2000) produce empirical findings based on portfolio analysis supporting the fact that the financial market positively values reported intangible assets on the balance sheet but regards income statement amortisation expenses as insignificant.

Gaum et al. (2000) find when relating intangible drivers to asset value in durable manufacturing companies, that innovation, ability to attract talented employees, alliances, quality (of major processes, products or services), environmental performance and brand investment are all statistically a predictor of corporate value. In conducting the same exercise for Internet companies, alliances, innovation and eyeballs (usage traffic) are found to be significant, but brand investment and stickiness (minutes spent on the Web) are not (Gaum et al., 2000). Their findings suggest that not all intangible assets might have an effect on market value.

Asset values are affected by revaluations. In fact upward revaluations of non-current assets have been used to enhance contractual efficiency when book values of firm's assets are materially below their current values (Cotter and Zimmer, 1995). Easton et al. (1993) find that book values including asset revaluation reserves are more aligned with market values than those book values in firms not including revalued assets. Might this also apply to intangible asset capitalisation?

It is interesting that in a 1998 survey of the top 150 Australian listed companies Petzke and Flower (1999) (cited in Miller and Loftus, 2000) find that the revaluation of property, plant and equipment is in fact limited in that while over 60 percent of companies revalue land and buildings regularly, recording at cost

predominates for assets other than land and buildings. However in their Australian study, Barth and Clinch (1998) find that whilst revalued financial, tangible and intangible assets are value relevant, of most surprise is the strength and consistency in the findings of the value relevance exhibited by intangible assets. They also find that many nonfinancial (but few financial and no mining) firms revalue intangible assets, where revaluation is either through recognition of internally generated intangibles or through changing the carrying amount of a purchased intangible asset. The most commonly revalued intangible asset is brands representing 32 percent of the revalued intangible assets, with a further 15 percent for a group of brands, patents and licences; 13.5 percent for separately listed licences; 13.5 percent for goodwill; 12 percent for technology assets and 13.5 percent for others (including executory contracts). In addition these revalued intangible assets are found to be value relevant regardless of the age of the revaluation (Barth and Clinch, 1998).

Finally, Barth (2000) drew value relevance studies together and reports that intangible assets are found to have relevance to investors, particularly in the areas of R&D, capitalised software, advertising (i.e. brands), patents and goodwill.

### **3.6 - Information Asymmetry, Size and Ownership Structure**

Managers, as insiders in an organisation, would normally know more about that organisation than external investors in the market place. This difference in information, or information asymmetry, is considered high when managers have a relatively large amount of company-specific information (unknown to the external market) and low when the amount of information is small. Until this specific information comes into the public domain (either through the passage of time or some information-releasing event) when information asymmetry will decrease, the market bears some uncertainty and investors have to use what information is available as the basis for decision-making.

Greater information asymmetry results in some interesting effects on market value, seen especially in the market's reaction to equity issue announcements.

Dierkens (1991) finds that increases in information asymmetry significantly increase the drop in price observed at an equity issue announcement. Also announcement-period returns are higher when less information is available (D'Mello and Ferris, 2000; Bayless and Chaplinsky, 1996). McLaughlin, Safieddine and Vasudevan (1998) examine the decline in firm operating performance from pre to post issue of equity and debt and find that equity issuers exhibit more negative changes and those with greater information asymmetries exhibit substantial performance declines whereas there is not a significant post-issue change in performance for those firms with smaller information asymmetries.

Information asymmetry can drive the demand for financial reporting and disclosure (Healy and Palepu, 2001) with greater disclosure resulting in positive outcomes. Chen, Defond and Park (2002) find that investor demand for additional value relevant information to supplement reported earnings in quarterly earnings announcements (where these earnings are less informative or future earnings are more uncertain) results in voluntary balance sheet disclosures.

Botosan (1997) associates greater corporate disclosure with a lower cost of equity capital (where companies have a low analyst following). This greater disclosure enhances stock market liquidity (reducing cost of equity capital either through reducing transaction costs or increasing demand for a firm's securities) and reduces estimation risk (arising from investors' estimates of the parameters of an asset's return or payoff distribution) (Botosan, 1997). Healy, Hutton and Palepu (1999) find that expanded disclosure leads to improved stock performance as well as increased institutional ownership, analyst following and stock liquidity, and that these increased disclosures coincide with increased use of public finance, both equity and debt. Sengupta (1998) extends the association to one between greater quality of corporate disclosure (degree of detail, timeliness and clarity of disclosures) and a lower default risk and cost of borrowing.

Whilst capitalisation of intangible assets will make an impact on the asset value, and evidence is strong for capitalised intangibles being value relevant for

investors, can it therefore be assumed that the presence or absence of these capitalised assets affects information asymmetry and therefore brings closer alignment between market and asset values? Muller III (1999) supports this in suggesting that capitalisation of brand names could lead to a reduction in differential information between management and potential capital providers.

There certainly seems to be support for the fact that if intangibles exist but are not capitalised, this increases information asymmetry. This is an assumption made by Barth and Kasznik (1999) who find a positive relationship between share repurchases and intangible assets. They find that if managers believe the market is undervaluing shares (due to the presence of unrecognised intangible assets) then they are more likely to repurchase at market price. Aboody and Lev (2000) find that insiders in R&D-intensive firms have substantially larger gains than those in non-intensive firms, so that R&D, often not a well-disclosed productive input, is a major contributor to information asymmetry.

Barth, Kasznik and McNichols (2001) find that firms that are more likely to have more intangible assets (based on the nature of the firm) have greater analyst coverage and that analysts expend more effort to follow such firms (after controlling for other factors associated with analyst effort). Also Wyatt and Wong (2002) find that a reputation for transparent reporting of intangible assets is associated with increased demand for analyst research and higher analyst incentives, whereas a reputation for less transparent reporting is associated with higher forecast dispersion and errors due to analysts' greater reliance on their own private information. This is consistent with a link between intangible assets and information asymmetry. Barth et al. (2001) leave open the question of whether capitalisation of intangibles is an efficient provider of information to investors, although Wyatt and Wong (2002) state that it is unlikely a policy of more transparent reporting on intangible assets would attract analysts unless intangible assets are value relevant information.

Two aspects that are seen as relevant in information asymmetry are company size and ownership structure. Although large companies will often have separation of ownership and control as defined in the classic agency relationship

by Jensen and Meckling (1976) where the effect on the relationship is one of increasing information asymmetry between managers and shareholders, small companies tend to produce less information about their operations and prospects and have a harder time credibly communicating their prospects (Scherr and Hulbert, 2001). Chari, Jagannathan and Ofer (1988) find that in analysing quarterly returns there is a greater increase in variability around quarterly earnings announcement dates for small firms, indicating greater information asymmetry for small firms. McLaughlin et al. (1998) use two proxies for information asymmetry, firm size and the ratio of market value to book value of equity and find that firms with high market-to-book ratios and smaller size exhibit greater declines in performance following the offering. Hence smaller size is associated with increased information asymmetry.

Ownership structure is also important in information asymmetry. Whereas firms with less information asymmetry have a larger percentage of institutional investors and are larger in size (Barth and Kasznik, 1999) and increased institutional ownership leads to expanded disclosure and stock liquidity (Kim and Verrecchia, 1994), companies with a greater level of information asymmetry are more likely to retain more insider ownership<sup>7</sup> (Hogan, Olson and Kish, 2001). So insider ownership is positively correlated with information asymmetry.

The level of insider ownership can affect market perception of value. Han and Suk (1998) find that the level of insider ownership affects evaluation of stock split decisions in that a decision by a firm with greater insider ownership is regarded as more credible because of the greater information asymmetries within those firms (and hence greater knowledge inside the firm). Findings by Steiner (1996) show that ownership structure significantly influences firm value and the lower the level of firm diversification, the higher the firm valuation, hence differences in market and book value may well be influenced by ownership structure. In an international study of seven major industrialized countries Han, Lee and Suk (1999) find a weak effect for insider shareholdings on firm performance, including

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<sup>7</sup> Insider ownership generally relates to "corporate insiders" defined by the US 1934 Securities and Exchange Act as corporate officers, directors and owners of 10 percent or more of any equity class of securities (Aboody and Lev, 2000).

market value. Only Germany had statistically meaningful results, where more closely held firms are apparently more highly valued by the market.

The level of insider ownership tends to have an effect on accounting practice. Francis and Smith (1995) find that diffusely-held firms are less innovative than closely-held firms, having fewer patent awards, being more likely to grow by acquisition rather than by internal development and being more sensitive to the timing of R&D expenditures. They suggest, in their conclusion, that an investigation into whether ownership structure plays a role in facilitating other investments in intangible assets could be an area for future research.

Moh'd, Perry and Rimbey (1998) report that the equity structure (i.e. the level of insider ownership) has an effect on capital structure in that as insider ownership increases there is a tendency for lower debt to reduce overall risk and/or agency costs. Findings presented by Carlson and Bathala (1997) imply that information asymmetry impacts on income smoothing behaviour in firms as they link ownership with income smoothing, finding that the lower the proportion of insider ownership the greater the probability of a firm being an income smoother. Firms with higher proportions of institutional ownership and debt financing are more likely to be in the income-smoothing category. If income could be adjusted through capitalising and amortising intangible assets, the above would suggest that this is more likely to occur in companies with greater insider ownership.

### **3.7 – Development of the Third Objective**

Value relevance of intangibles is supported by research; however, information asymmetry can result in problems in the market place. It would seem logical that the capitalising of intangible assets should lower the effects of information asymmetry by producing a better determination of market value. However, the effects may be different for different types of companies (whether they are by nature intangible-intensive or not); for companies of different size; and for companies with different ownership structures.

Hence the third objective investigates the relationship between capitalisation and market value for NZSE-listed companies. The research examines whether there is a difference in the effects on market value from different intangible assets, particularly differentiating between goodwill and others. Additionally, factors of sector, size, ownership structure and debt level are introduced to determine whether these have any effect on the relationship between market value and capitalised intangibles. Within the context of the research, the question is: does greater disclosure through capitalising intangible assets affect information asymmetry?

Objective Three is stated as:

*To determine whether the capitalisation of intangible assets has any effect on the relationship between assets and market value.*

### **3.8 – Contribution of the Research**

This research is contributing to the knowledge of intangible asset capitalisation by NZSE-listed companies, focusing on the variety of intangible assets capitalised, how those assets are valued, the effect of capitalising on the book value of assets, and the value relevance of that capitalisation.

In addition, the research hopes to highlight any relationship between capitalisation and the level of debt, as well as exploring connections between capitalisation and the type of company (industry sector) as well as corporate size and ownership structure (factors that can affect information asymmetry).

Analysis is cross-sectional in that the information has been collected from only one financial year, so no trends can be analysed. However, in addition to providing information about the areas specified it is hoped that this information will act as a baseline for further research that may be longitudinal in nature.

## ***Chapter Four – Descriptive Overview of Intangible Capitalisation***

### **4.1 – Introduction**

With little background on intangible capitalisation in New Zealand companies the first objective is to provide some information about the extent and type of capitalisation within these companies.

The initial database for NZSE-listed companies in September 2000 consists of 172 companies but 21 are eliminated in the first instance because annual reports are unobtainable. Out of these remaining 151 companies share price information is available for 134 from a Datex database and so it is these 134 companies that provide the base for the analysis work done. (Of the 17 companies eliminated here all except one are investment companies and none capitalise intangible assets.)

For those companies that report in their annual reports in a currency other than New Zealand dollars the financial information is converted into New Zealand dollars using the exchange rate at the company's balance date.

This chapter covers the methodology used to investigate the first objective in Section 4.2 followed by the findings in Sections 4.3 to 4.9 and concluding with a summary of the chapter findings in Section 4.10.

## 4.2 – Methodology for Objective One

### 4.2.1 - Objective One

*To determine the type of intangible assets capitalised by New Zealand companies, the diversity of capitalisation over company size and industry sector, the value of those assets and their contribution to total and non-current asset value, how their value is determined and whether they are being amortised.*

### 4.2.2 – Descriptive Information

To give an overview of the value range for the New Zealand companies in the study, descriptive measures (mean, median, standard deviation, and lower and upper quartiles) for market value of equity, total assets and total liabilities are given for all companies as well as a breakdown between those companies capitalising and not capitalising intangible assets. A Mann-Whitney test for difference in the market value of equity is conducted between capitalising and non-capitalising companies. In addition, for capitalising companies, the same descriptive measures are given for total intangible assets, goodwill and other identifiable intangible assets capitalised.

When reporting the results, where appropriate comparisons are made to the findings in an Australian study by Godfrey and Koh (2001) where the authors examine 172 Australian companies that capitalise intangible assets in the 1999 year. As our close neighbours and with a similar reporting regime in relation to intangible assets, it is felt this recent Australian study provides a relevant comparison.

Companies are then categorised based on company size and industry sector to give a picture of the type and size of companies in the study. The size split is based on market value and the companies are split into three equally sized groups, large, medium and small, where large companies have market values

above \$1,600 million and small companies have market values below \$40 million. Industry sector is based on classifications used by the New Zealand Stock Exchange.

To see the diversity of intangible asset capitalisation across industry sector and company size, the proportion of companies capitalising intangible assets is determined based both on sector and size. Initially this is based on total intangible assets and then split into goodwill and other intangibles.

Capitalised R&D is included as part of other identifiable intangible assets in the study and not considered separately. In their research on Australian companies capitalising intangibles, Godfrey and Koh (2001) find that only 12 companies out of 172 capitalising companies in Australia capitalise R&D and that it is insignificant in valuation studies. Examining companies in the 1997 year, Anderson (1999) finds that only six New Zealand companies capitalise R&D so it is expected that currently the number of New Zealand companies capitalising R&D will be too small to warrant separate consideration.

#### **4.2.3 – Contributions to Value**

To distinguish between the different contributions made to total capitalised intangible asset value, a breakdown between capitalised goodwill and other intangible assets based on percentage value of total intangibles is given. The association is tested using a chi-square test.

Then the contribution made by capitalised intangible assets to asset value on the balance sheet is determined using the percentage contribution made to both total and non-current assets. This is calculated for total intangible assets and then for goodwill and other intangibles. Descriptive statistics for the contributions and the results of chi-square tests for association are reported.

#### **4.2.4 – Intangible Assets Capitalised at Cost or Value**

As New Zealand companies are allowed to revalue assets, the extent to which this is happening for intangible asset capitalisation is analysed by looking at the number of companies that have intangible assets at value rather than cost and the value contribution of those intangible assets.

#### **4.2.5 – Amortisation**

The period of amortisation for both goodwill and other intangibles is recorded for all the capitalising companies to see if they are amortising intangible assets, and if so, whether they are following the guidelines of a 20 year maximum period set down in SSAP-8 (in force in 2000) and ED-87.

### **4.3 – The Overview**

Of the 134 companies forming the basis of the study, 81 (60 percent) capitalise intangible assets, with 68 companies (84 percent of capitalising companies and 51 percent overall) capitalising goodwill and 44 (54 percent of capitalising companies and 33 percent overall) capitalising other identifiable intangible assets (such as brands, trademarks etc.).<sup>8</sup> The capitalisation rate of goodwill is consistent with the findings for Australian companies by Godfrey and Koh (2001) where 85 percent of companies capitalise goodwill, but the capitalisation rate for other intangibles is higher for Australian companies at 69 percent.

As goodwill is capitalised as a result of corporate acquisitions, the high level of capitalisation is not unexpected. However, with respect to other intangibles, Godfrey and Koh (2001) report that their finding of 69 per cent is more than double the percentage identified by Wines and Ferguson (1993) in 1989 of 29

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<sup>8</sup> There is an overlap here with some companies capitalising either goodwill or other identifiable intangibles, and other companies capitalising both, covered in more detail in Section 4.6.2.

percent, suggesting either a growth in reporting or sampling differences. Hence the difference between the New Zealand and Australian percentages might be due to a slower growth rate in this type of capitalisation, but without longitudinal research on New Zealand intangible capitalisation, this is difficult to discern.

Two of the capitalising companies combine goodwill with other intangibles, in the first instance customer contracts and in the second, customer bases, but because separate values are not disclosed for the purposes of the study they are classified simply as goodwill.

Identifiable intangible assets are varied and include items such as brand names, licenses, patents, trademarks, intellectual property, customer bases, development costs, resource consents, rights, publishing titles and mastheads. Many companies capitalise more than one type of identifiable intangible asset although sometimes these assets were recorded in an aggregated form, for example 'Patents, trademarks and licences', so that individual values are not able to be determined. Brands and licences, followed by trademarks, are the most commonly capitalised intangible assets, consistent with findings in other overseas studies cited in Chapter Three.

As expected only a small number of companies capitalise development costs - seven in all, thereby supporting the decision to include them as part of other identifiable intangibles rather than considering them separately.<sup>9</sup>

To put some perspective on the value represented by these capitalised intangibles, in the 2000 year these assets represent \$10,663 million of capitalised value with 43 percent (\$4,604 million) of that being goodwill and 57 percent (\$6,059 million) being other identifiable intangible assets. For those 81 companies capitalising intangibles, this total intangible capitalised value represents only 3.44 percent of the total asset value of \$309,838 million. Whilst

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<sup>9</sup> Out of interest, few companies disclose the expensing of R&D. There are 14 companies disclosing these expenses in the 2000 year, comprised of two of the seven capitalising companies plus another 12. Of those 14 companies disclosing R&D expenses, 11 capitalise intangible assets and three do not.

this percentage seems small, the descriptive statistics following show a considerable degree of skew within the company data and as seen in later analysis there are in fact a considerable number of companies where the value of capitalised intangibles makes a sizeable contribution to overall asset value.

#### **4.4 – Descriptive Statistics**

Table 4.1 presents the descriptive statistics for the companies, giving information for the total of 134 companies and then distinguishing between capitalising and non-capitalising companies. The median is presented first because as a measure of centre it is more representative than the mean because of the highly positive skew on the data set. (This skew is due to the large number of smaller companies combined with a few very large companies.) This is a similar pattern to the Australian company data reported by Godfrey and Koh (2001) although the Australian companies are larger overall with a median market value of AUS\$258 million.

The descriptive measures highlight the fact that the 53 non-capitalising companies are noticeably smaller than the 81 capitalising companies across all measures. A Mann-Whitney test of difference in market value of equity between capitalising and non-capitalising companies is significant at 2 percent.

The median value of capitalised goodwill is just over half the value of other capitalised intangibles, highlighting that for all the companies capitalising intangible assets the greater value is contributed by intangibles other than goodwill.

**TABLE 4.1: DESCRIPTIVE STATISTICS FOR COMPANY DATA**

<b>Variables</b>	<b>N</b>	<b>Median (\$'000s)</b>	<b>Mean (\$'000s)</b>	<b>Standard Deviation</b>	<b>Lower Quartile (\$'000s)</b>	<b>Upper Quartile (\$'000s)</b>
MVE <sub>TOTAL</sub>	134	86,127	1,516,623	10,177,774	28,783	390,066
MVE <sub>NON-IA</sub>	53	48,947	208,777	391,805	12,926	225,300
MVE <sub>IA</sub>	81	100,581	2,372,375	13,047,571	31,065	667,765
TA <sub>TOTAL</sub>	134	129,848	2,490,369	15,526,927	35,979	459,262
TA <sub>NON-IA</sub>	53	84,861	458,994	957,707	17,033	435,904
TA <sub>IA</sub>	81	141,618	3,819,541	19,891,853	49,467	798,471
TL <sub>TOTAL</sub>	134	65,474	1,989,983	14,418,572	8,501	192,326
TL <sub>NON-IA</sub>	53	36,992	188,734	482,859	3,165	133,588
TL <sub>IA</sub>	81	87,344	3,168,578	18,491,034	12,756	372,836
TIA	81	8,796	131,642	332,320	2,874	63,399
GW	68*	4,741	67,705	197,313	2,301	43,252
OIA	44*	8,062	137,705	334,815	1,893	63,862

*TOTAL = Total companies, NON-IA = Companies not capitalising intangibles, IA = Capitalising companies  
MVE = Market value of equity, TA = Total Assets, TL = Total Liabilities, TIA = Total Intangible Assets,  
GW = Capitalised Goodwill, OIA = Capitalised Intangible Assets (other than goodwill)  
\*These are the companies that capitalise GW and OIA*

## 4.5 - Company Size and Sector

Table 4.2 classifies the number of companies by size and sector.

Whilst there is a variation in the number of companies in each sector, ranging from 17 and 16 in the Finance and Investment sectors to 2 and 3 in the Technology and Textiles sectors, there is a distribution across all sizes in most sectors. Larger companies tend to dominate in the Food, Transport and Building sectors whereas smaller companies tend to dominate the Mining sector.

Overall there is a good diversity of company type and size.

**TABLE 4.2: COMPANIES BY SECTOR AND SIZE**

<b>Sector</b>	<b>Large</b>	<b>Medium</b>	<b>Small</b>	<b>Total</b>
Agriculture/Fishing	2	4	3	9
Building/Construction	2	2	0	4
Consumer	1	6	4	11
Durables	1	2	2	5
Energy/Utilities	8	1	2	11
Finance/Others	8	5	4	17
Food/Beverages	6	0	1	7
Forestry/Forestry Products	2	1	2	5
Investment	2	5	9	16
Leisure/Tourism	2	3	3	8
Media/Communications	4	3	2	9
Mining	0	1	4	5
Ports	3	2	1	6
Property	1	5	6	12
Technology	1	1	0	2
Textiles/Apparel	0	2	1	3
Transport	2	2	0	4
<b>Total</b>	<b>45</b>	<b>45</b>	<b>44</b>	<b>134</b>

## 4.6 - Intangible Asset Capitalisation

### 4.6.1 – Capitalisation by Company Size and Industry Sector

Table 4.3 shows that larger companies have a greater propensity to capitalise intangible assets (which would be expected after the measures reported in Table 4.1). Two thirds of large and medium sized companies capitalise intangible assets, whereas the percentage is under half for the small company bracket. However a chi-square test for association between the number of companies capitalising or not capitalising intangibles and company size is not found to be statistically significant.

**TABLE 4.3: INTANGIBLE ASSET CAPITALISATION**

Company Size	Total Number of Companies	Number of Companies with Intangible Assets	Percentage of Companies with Intangible Assets
Large	45	30	67%
Medium	45	30	67%
Small	44	21	48%

*Chi-square test – p-value of 0.109*

The diversity of intangible asset capitalisation across sector and size can be seen from Table 4.4.

**TABLE 4.4: COMPANIES CAPITALISING INTANGIBLE ASSETS (BY SECTOR AND SIZE)**

Sector	Large		Medium		Small		Total		%
	Total	IA Co.	Total	IA Co.	Total	IA Co.	Total	IA Co.	
Agriculture/Fishing	2	1	4	2	3	2	9	5	56%
Building/Construction	2	1	2	2	0	0	4	3	75%
Consumer	1	1	6	5	4	2	11	8	73%
Durables	1	1	2	2	2	2	5	5	100%
Energy/Utilities	8	5	1	0	2	0	11	5	45%
Finance/Others	8	6	5	4	4	4	17	14	82%
Food/Beverages	6	4	0	0	1	0	7	4	57%
Forestry/Forestry Products	2	1	1	0	2	0	5	1	20%
Investment	2	1	5	4	9	4	16	9	56%
Leisure/Tourism	2	2	3	2	3	1	8	5	63%
Media/Communications	4	4	3	3	2	1	9	8	89%
Mining	0	0	1	1	4	4	5	5	100%
Ports	3	0	2	1	1	0	6	1	17%
Property	1	0	5	0	6	0	12	0	0%
Technology	1	1	1	0	0	0	2	1	50%
Textiles/Apparel	0	0	2	2	1	1	3	3	100%
Transport	2	2	2	2	0	0	4	4	100%
<b>Total</b>	<b>45</b>	<b>30</b>	<b>45</b>	<b>30</b>	<b>44</b>	<b>21</b>	<b>134</b>	<b>81</b>	<b>60%</b>

Over the size range, there is diversity in capitalisation rates, but as seen more clearly in Table 4.5, the majority of sectors have more than 50 percent of their companies capitalising intangibles, with the Property sector being the only one where there are no capitalising companies.

However it is important to remember that this is recording capitalised intangibles only and does not account for any uncapitalised intangibles a company may have which are beyond the scope of this study.

**TABLE 4.5: PERCENTAGE OF COMPANIES WITH INTANGIBLE ASSETS**

Sector	Large	Medium	Small	Total
	%	%	%	%
Durables	100	100	100	100
Textiles/Apparel	n.c.	100	100	100
Mining	n.c.	100	100	100
Transport	100	100	n.c.	100
Media/Communications	100	100	50	89
Finance/Others	75	80	100	82
Building/Construction	50	100	n.c.	75
Consumer	100	88	50	73
Leisure/Tourism	100	67	33	63
Food/Beverages	67	n.c.	0	57
Agriculture/Fishing	50	50	67	56
Investment	50	80	44	56
Technology	100	0	n.c.	50
Energy/Utilities	63	0	0	45
Forestry/Forestry Products	50	0	0	20
Ports	0	50	0	17
Property	0	0	0	0

*Note: n.c. means no companies appear at all in this size and sector.*

#### 4.6.2 - Distinguishing Other Intangible Assets from Goodwill

Tables 4.6 and 4.7 give a breakdown by size and sector between goodwill and other capitalised intangible assets with Table 4.6 showing that more companies capitalise solely goodwill (46 percent) than capitalise a combination of both goodwill and other intangible assets, whilst only a few companies (16 percent) capitalise intangibles without also capitalising goodwill.

**TABLE 4.6: GOODWILL AND OTHER INTANGIBLE ASSETS BY COMPANY SIZE**

Company Size	Both Goodwill and Other Intangible Assets		Goodwill Only		Other Intangible Assets Only		Total
	No.	%	No.	%	No.	%	
Large	15	50	12	40	3	10	30
Medium	9	30	17	57	4	13	30
Small	7	33	8	38	6	29	21
<b>Total</b>	<b>31</b>	<b>38</b>	<b>37</b>	<b>46</b>	<b>13</b>	<b>16</b>	<b>81</b>

Of the large companies, 90 percent capitalise goodwill whereas this drops to 71 percent for small companies. This is not unexpected, with goodwill arising from corporate acquisition, resulting in larger companies. However capitalisation rates for small companies are similar for other intangibles (60 percent for large and 61 percent for small companies). Across the sizes smaller companies form the highest percentage of companies capitalising solely intangibles other than goodwill. This suggests that larger companies are in general more conservative in capitalisation of intangibles other than goodwill.

When viewing by sector in Table 4.7 (and excluding the non-capitalising Property sector), only four sectors (Forestry, Mining, Ports and Transport) do not have companies that capitalise a combination of goodwill and other intangible assets and in fact Forestry and Transport are the only sectors with companies capitalising solely goodwill.

The 13 companies capitalising intangibles other than goodwill are spread over eight sectors with quite a variety in the type of intangible assets capitalised including brands, trademarks and quotas. For mining companies, which are the only companies with a high likelihood of capitalising intangible assets other than goodwill, a lot of the intangible value comes from licences.

**TABLE 4.7: GOODWILL AND OTHER INTANGIBLE ASSETS BY COMPANY SECTOR**

<b>Sector</b>	<b>Both Goodwill and Other Intangible Assets</b>	<b>Goodwill Only</b>	<b>Other Intangible Assets Only</b>	<b>Total</b>
Agriculture/Fishing	2	1	2	5
Building/Construction	1	2	0	3
Consumer	3	4	1	8
Durables	2	3	0	5
Energy/Utilities	2	2	1	5
Finance/Others	4	9	1	14
Food/Beverages	2	0	2	4
Forestry/Forestry Products	0	1	0	1
Investment	4	5	0	9
Leisure/Tourism	3	2	0	5
Media/Communications	5	2	1	8
Mining	0	1	4	5
Ports	0	0	1	1
Property	0	0	0	0
Technology	1	0	0	1
Textiles/Apparel	2	1	0	3
Transport	0	4	0	4
<b>Total</b>	<b>31</b>	<b>37</b>	<b>13</b>	<b>81</b>

## 4.7 – The Contribution to Value

### 4.7.1. – Contribution to Total Intangible Asset Value made by Goodwill and Other Intangible Assets

Tables 4.8 and 4.9 highlight the percentage contribution to total intangible value made by goodwill and other intangibles.

**TABLE 4.8: PERCENTAGE VALUE OF TOTAL CAPITALISED INTANGIBLE ASSETS REPRESENTED BY GOODWILL**

	Number of Companies	Percentage of Companies
100%	37	54
Between 75% and 100%	9	13
Between 50% and 75%	4	6
Between 25% and 50%	4	6
Less than 25% but more than 0%	14	21
<b>Total</b>	<b>68</b>	<b>100</b>

**TABLE 4.9: PERCENTAGE VALUE OF TOTAL CAPITALISED INTANGIBLE ASSETS REPRESENTED BY INTANGIBLES OTHER THAN GOODWILL**

	Number of Companies	Percentage of Companies
100%	13	30
Between 75% and 100%	14	32
Between 50% and 75%	4	9
Between 25% and 50%	4	9
Less than 25% but more than 0%	9	20
<b>Total</b>	<b>44</b>	<b>100</b>

Although goodwill represents a higher proportion of total intangible value than other intangibles, when considering a contribution of more than 50 percent of total value the percentage of companies is similar (73 percent for goodwill companies and 71 percent for other intangible companies).

A chi-square test for association is significant at the 10 percent level (p-value of 0.062), suggesting that the difference in level of contribution by goodwill and other intangibles is significant.

#### 4.7.2 – The Contribution to Value on the Balance Sheet made by Intangible Asset Capitalisation

Whilst it is apparent that a considerable number of companies capitalise intangible assets, what difference does this capitalisation make to the total asset and noncurrent asset value – are companies that capitalise making a significant difference to their balance sheets?

Table 4.10 presents the range of percentage contribution to both total and non-current assets made by capitalised intangibles.

**TABLE 4.10: CAPITALISED INTANGIBLE ASSETS AS A PERCENTAGE OF TOTAL AND NON CURRENT ASSETS**

Percentage	Intangible Assets/Total Assets		Intangible Assets/Non current Assets	
	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies
Greater than 50%	10	12	21	26
Between 20% and 50%	20	25	17	21
Between 5% and 20%	15	19	22	27
Less than 5%	36	44	21	26
<b>Total</b>	<b>81</b>	<b>100</b>	<b>81</b>	<b>100</b>

Table 4.10 shows that capitalised intangibles contribute more than 20 percent of the total asset value in over one third of the companies.

For over a quarter of the companies, capitalised intangibles represent more than 50 percent of noncurrent asset value. So whilst there are obviously a number of companies where capitalisation of intangibles is not making a big difference to asset value, there is still a significant proportion where intangible asset capitalisation is making a difference. But what types of intangibles are contributing to this?

From Table 4.11 it can be seen that in the higher contribution category (greater than 50 percent of value) other intangibles are greater contributors to value than goodwill. There is a tendency for goodwill to dominate the lower contribution categories so that where contributing more than zero but less than 20 percent to total (noncurrent) asset value, goodwill has 66 percent (62 percent) whereas other intangibles have only 35 percent (27 percent).

**TABLE 4.11: CAPITALISED GOODWILL AND OTHER INTANGIBLE ASSETS AS A PERCENTAGE OF TOTAL AND NON CURRENT ASSETS**

Percentage	GW/TA		OIA/TA		GW/NCA		OIA/NCA	
	No.	%	No.	%	No.	%	No.	%
Greater than 50%	2	3	6	7	9	11	10	12
Between 20% and 50%	12	15	10	12	9	11	12	15
Between 5% and 20%	14	17	7	9	20	25	9	11
Between 0% and 5%	40	49	21	26	30	37	13	16
0%	13	16	37	46	13	16	37	46
<b>Total</b>	<b>81</b>	<b>100</b>	<b>81</b>	<b>100</b>	<b>81</b>	<b>100</b>	<b>81</b>	<b>100</b>

*GW/TA is the percentage of total assets represented by goodwill*

*OIA/TA is the percentage of total assets represented by other intangible assets*

*GW/NCA is the percentage of non-current assets represented by goodwill*

*OIA/NCA is the percentage of non-current assets represented by other intangible assets*

Therefore although companies have a greater tendency to capitalise goodwill rather than other intangible assets, where other intangibles are capitalised they tend to contribute more to total value on the balance sheet.

Chi-square tests of significance between percentage size and intangible asset type (goodwill or other) for both the relationship to total assets and to non-current assets give p-values of 0.000, significant at less than 1 percent.

Descriptive statistics for these percentages are in Table 4.12

	Percentages				
	Mean	Median	Standard Deviation	Lower Quartile	Upper Quartile
Intangible Assets/Total Assets	18.82	22.45	6.87	1.73	32.85
Intangible Assets/NC Assets	28.43	29.23	15.81	4.28	53.98
Goodwill/Total Assets	11.21	3.26	17.52	0.64	14.27
Goodwill/NC Assets	18.09	5.87	25.85	1.28	23.70
Other Intangible Assets/Total Assets	17.32	7.36	20.22	1.60	29.64
Other Intangible Assets/NC Assets	24.38	17.28	24.00	2.51	36.75

*NC Assets = Noncurrent Assets*

There are differences in the contribution made by intangibles for New Zealand companies compared with Australian as identified by Godfrey and Koh (2001). In New Zealand the mean (median) for goodwill represents 11.2 percent (3.2 percent) of total asset value whereas in Australia it represents 7.1 percent (3.4 percent). The median for the two data sets is very similar and the difference in the means may simply be due to the relative skew of the two data sets. However, the mean (median) for other intangible assets as a percentage of total asset value is 17.3 percent (7.4 percent) for New Zealand companies and 13 percent (4 percent) for Australian companies, which represents quite a difference. The quartile measures too are higher for New Zealand companies than Australian, suggesting that although a smaller percentage of New Zealand companies

capitalise other intangibles, overall capitalisation represents a higher contribution to asset value for New Zealand companies than for Australian companies.

#### **4.8 - Intangible Assets Capitalised at Cost or Value**

Where goodwill is capitalised it is always at cost.

Twelve of the companies capitalising intangible assets other than goodwill do so at value rather than at cost (although four of these also had additional intangibles, other than goodwill, at cost) and the majority of these make provision for impairment but do not amortise these intangible assets.

These assets capitalised at value are varied but include five brands and three licences. Most are valued independently but only four companies named an external valuer. Three companies used a valuation by directors, one of which was supported by an independent valuation. These valuations took place at various times, three in the 2000 year, but others in 1994, 1995 and 1998, and for some the date of valuation was not stated. There is a likelihood that some of these assets (particularly brands) are internally generated assets, but ascertaining this would necessitate tracing when the asset first appeared on the balance sheet, which is beyond the scope of the current study.

In the feedback on ED-87 (Russell-Green, 2000) 28 of the 39 responses disagreed with recognition of intangible assets at cost and 19 disagreed with revaluation by reference to an active market. Although opposition was strong in these areas it appears that only a few New Zealand companies are capitalising intangible assets and subsequently revaluing them.

Of specific interest is the value of these capitalised intangibles. At \$2,688 million, it represents 44 percent of the capitalised value of intangibles other than goodwill (\$6,059 million) and 25 percent of the total capitalised intangible value (\$10,663 million) within the 81 companies.

Table 4.13, which differentiates between other intangibles capitalised at cost and at value (with the total as per Table 4.12 for comparison), highlights the fact that for those companies that capitalise at value, that capitalisation contributed on average 32 percent of total asset value and nearly 40 percent of noncurrent asset value. The median values are lower, but both mean and median values are quite a lot higher than those for companies with capitalisation at cost. Hence, although only a small number of companies capitalise at value, when they do so it contributes quite significantly to the balance sheet.

**TABLE 4.13: MEAN and MEDIAN FOR PERCENTAGE CONTRIBUTION TO TOTAL AND NONCURRENT ASSET VALUE MADE BY OTHER INTANGIBLE ASSETS**

Percentage	Mean			Median		
	OIA <sub>R</sub>	OIA <sub>C</sub>	OIA <sub>T</sub>	OIA <sub>R</sub>	OIA <sub>C</sub>	OIA <sub>T</sub>
Other Intangible Assets/Total Assets	32.10	10.18	17.32	27.67	2.46	7.36
Other Intangible Assets/Noncurrent Assets	39.44	16.20	24.38	34.61	6.24	17.28

*OIA<sub>R</sub>* = Other Intangible Assets (Revalued)

*OIA<sub>C</sub>* = Other Intangible Assets (At cost)

*OIA<sub>T</sub>* = Other Intangible Assets (Total)

#### 4.9 - Amortisation Details for Companies

For the 68 companies capitalising goodwill, Table 4.14 gives the frequency of amortisation periods summarised from company Accounting Policies.

**TABLE 4.14: GOODWILL AMORTISATION**

Amortisation Period for Goodwill	Number of Companies
25 years	1
A period between 10 and 20 years	31
10 years or less	28
Over (unspecified) period of expected benefits	6
No information given	2
<b>Total</b>	<b>68</b>

The guidelines in SSAP-8 (in force at the time period studied) suggest that the goodwill period is unlikely to exceed 10 years with 20 years as the maximum period for amortisation. Fewer than half the companies have an amortisation period of 10 years or less with many amortising goodwill over a longer period. However only one company exceeds the 20 year maximum.

For the 44 companies that capitalise intangible assets other than goodwill, there is less consistency in treatment. As some companies have more than one asset and therefore different methods of amortisation, Table 4.15 shows the number of times this amortisation period is used over the 44 companies. Four companies (representing seven assets) exceed the 20 year maximum recommended in ED-87 but what is interesting is the number of companies where the period is not specified or which do not amortise at all.

The respondents to ED-87 (Russell-Green, 2000) are divided on the issue of a 20-year rebuttable presumption for the useful life of intangibles and although this seemed to be the least of the contentious issues, it is the area where New

Zealand companies seem to be departing from the suggested guidelines. In seven instances amortisation periods exceed the 20 year maximum recommended in ED-87 but fewer than half the assets have a specified amortisation period. Whilst impairment is being used in six instances, there are 17 instances where the period of amortisation is not specified, nine instances where assets are not amortised and six instances where there is no information at all. Obviously some New Zealand companies are taking a fairly liberal approach to intangible asset amortisation.

**TABLE 4.15: AMORTISATION OF OTHER INTANGIBLE ASSETS**

<b>Amortisation Period for Other Intangible Assets</b>	<b>Number of times</b>
Periods over 20 years	7
Periods between 2 and 20 years	27
Over (unspecified) period of expected benefits	17
Impairment	6
Asset not amortised	9
No information given	5
<b>Total</b>	<b>71</b>

#### **4.10 – Summary of Chapter Findings**

Although not as extensive as capitalisation documented for Australian companies, NZSE-listed companies are capitalising a wide variety of intangible assets, spread across industry sector and size.

Most industry sectors, with the exception of Property, have some companies capitalising either goodwill or other identifiable intangible assets, or both, with one hundred percent capitalisation in four sectors.

There is generally a greater tendency for capitalisation to occur in larger rather than smaller companies, but smaller companies are the most likely to capitalise identifiable intangible assets without goodwill. Larger companies are more likely to have capitalised goodwill because of corporate acquisitions, but the findings suggest that smaller companies may be less conservative in their approach to capitalising other identifiable intangible assets.

Intangible asset capitalisation makes a significant contribution to value for some companies and although a smaller percentage of New Zealand companies capitalise other intangibles than their Australian counterparts, overall capitalisation represents a higher contribution to asset value for New Zealand companies than for Australian companies.

Whilst goodwill is capitalised by more companies than other types of intangibles, the greater contributions to asset value tend to come from the capitalisation of other identifiable intangibles.

Most intangible assets are capitalised at cost with only a few companies capitalising some identifiable intangibles at value. New Zealand companies are therefore conservative in this respect. However they are not as conservative with their amortisation practices. Whilst goodwill is likely to be amortised according to professional guidelines (although there is a tendency towards adopting an extended time period for amortisation), a more liberal approach is taken with amortisation of other identifiable intangible assets, presumably taking advantage of the lack of mandatory requirements, with a number of companies not amortising capitalised intangibles at all.

## ***Chapter Five – Capitalised Intangible Assets and Debt***

### **5.1 – Introduction**

Capitalising intangible assets will have an effect on the debt-to-equity ratios and therefore there is a possibility that capitalisation may be motivated by leverage factors. If a company is operating under a debt covenant with debt-to-asset constraints, the covenant will often exclude goodwill from the definition of assets but there may be more flexibility with other intangibles. Wong and Wong (2001) report that the debt agreements of the acquiring companies in their New Zealand sample specifically permit identifiable intangible assets (such as brands, mastheads and publishing titles) in the calculation of total assets or shareholders' funds (the denominator of leverage).

Intangible capitalisation has perceived benefits as Muller III (1999) reports, where capitalising brands amongst UK firms increases asset value and acts as a contracting cost incentive. A specific motivation for capitalising intangibles is observed, but regardless of whether such a motivation is apparent, the fact is that capitalising intangibles will always improve the balance sheet picture. In addition, low amortisation rates can maintain value on the balance sheet, something that may also be motivated by leverage considerations.

Any association between intangible capitalisation and debt levels, and therefore whether leverage factors might be acting as an incentive to capitalise or to drive amortisation practices, is the basis of the second objective in the study. This chapter covers the methodology used to investigate this second objective in Section 5.2, followed by the findings in Sections 5.3 to 5.6 and concluding with the chapter summary in Section 5.7.

## **5.2 – Methodology for Objective Two**

### **5.2.1 - Objective Two**

*To determine whether intangible asset capitalisation and associated amortisation periods are related to the level of debt.*

### **5.2.2 – Debt-to-equity levels**

In examining the data from the 134 companies for this objective, debt-to-equity percentages are used to ensure a relative measure of debt.

Firstly debt-to-equity percentages (using both total and long-term debt) are determined for all companies and reported to see whether there are any differences between capitalising and non-capitalising companies. Descriptive statistics are provided and Mann-Whitney tests are used to test for differences between capitalising and non-capitalising companies in both total and long-term debt-to-equity.

Total and long-term debt-to-equity percentages are then categorised according to size levels and reported for capitalising and non-capitalising companies with chi-square tests for association between these companies and debt levels carried out.

This categorisation is then repeated for total debt-to-equity percentages in capitalising companies split into types of capitalisation. A Mann-Whitney test is carried out for the difference between the debt-to-equity percentages for companies that capitalise solely goodwill or other intangible assets.

### **5.2.3 – Contribution to total asset levels**

If intangible asset capitalisation is going to have any noticeable effect on the debt-to-equity percentage, it will have to contribute significantly to total asset value. So levels of debt-to-equity are associated with different levels of intangible-to-total asset percentages, first over total intangibles and then between companies capitalising different types of intangibles (goodwill, other intangibles or both), with statistical significance in the association between level of debt and level of capitalisation tested using a chi-square test.

A similar breakdown is given for companies capitalising at value rather than at cost, because the choice to capitalise at value may be motivated by leverage considerations. (Both Easton et al. (1993) and Aboody et al. (1999) establish links between asset revaluations and debt levels.)

### **5.2.4 – Effect of capitalisation on debt-to-equity percentages**

The effect on total debt-to-equity percentages when capitalised intangible assets are removed from equity is examined by looking at the range of debt-to-equity percentages over different types of capitalisation. Then the changes in the debt-to-equity from inclusion to exclusion of intangibles is analysed based on number of companies and descriptive statistics.

### **5.2.5 – Amortisation Practices**

Amortisation practices of high debt companies are investigated to see if amortisation over extended time periods, or no amortisation, might be influenced by leverage considerations.

### 5.3 – Levels of Debt-to-Equity

Table 5.1 gives the descriptive statistics for the percentages of total and long-term debt-to-equity. Here, the overall range has been included so that the scope of the variation is clearly seen.

**TABLE 5.1: DESCRIPTIVE STATISTICS FOR DEBT-TO-EQUITY PERCENTAGES**

	Mean	Median	Lower Quartile	Upper Quartile	Overall Range
<b>81 Capitalising Companies</b>					
Total Debt-to-Equity	186	109	48	173	3473
Long Term Debt-to-Equity	104	37	5	85	2308
<b>53 Non-Capitalising Companies</b>					
Total Debt-to-Equity	78	46	23	85	866
Long Term Debt-to-Equity	34	23	0	57	144

Capitalising companies have a higher mean and median, but also a much greater overall range than non-capitalising companies. Testing for difference in debt-to-equity percentages between capitalising and non-capitalising companies using Mann-Whitney tests results in significance at 0.03 percent for total debt-to-equity and significance at 2.17 percent for long term debt-to-equity. Therefore whilst there are significant differences in levels of debt-to-equity between capitalising and non-capitalising companies, the differences are greater for total debt.

Tables 5.2 and 5.3 give the percentage ranges of total and long term debt-to-equity for capitalising and non-capitalising companies. Capitalising companies include a higher percentage of companies with greater levels of debt (both total and term) relative to equity than the non-capitalising companies. Only 6 percent of non-capitalising companies (compared to 21 percent for capitalising companies) exceed the 200 percent mark for total debt-to-equity percentages and there are no non-capitalising companies that exceed this percentage for long term debt-to-equity.

**TABLE 5.2: PERCENTAGES OF TOTAL DEBT-TO-EQUITY**

Total Debt-to-Equity	Capitalising Companies		Non-Capitalising Companies		Total Companies	
	No.	%	No.	%	No.	%
Greater than 500%	6	7	1	2	7	5
200% to 500%	11	14	2	4	13	10
100% to 200%	26	32	8	15	34	25
50% to 100%	17	21	15	28	33	24
Less than 50%	21	26	27	51	48	36
<b>Total</b>	<b>81</b>	<b>100</b>	<b>53</b>	<b>100</b>	<b>134</b>	<b>100</b>

**TABLE 5.3: PERCENTAGES OF LONG TERM DEBT TO EQUITY**

Long Term Debt-to-Equity	Capitalising Companies		Non-Capitalising Companies		Total Companies	
	No.	%	No.	%	No.	%
Greater than 500%	4	5	0	0	4	3
200% to 500%	5	6	0	0	5	4
100% to 200%	7	9	4	7	11	8
50% to 100%	20	25	11	21	31	23
Less than 50%	45	55	38	72	83	62
<b>Total</b>	<b>81</b>	<b>100</b>	<b>53</b>	<b>100</b>	<b>134</b>	<b>100</b>

Chi-square tests for association between debt-to-equity percentages and capitalising and non-capitalising companies, based on the table categories in Tables 5.2 and 5.3, give a p-value of 0.005 for the total debt, significant at less than 1 percent, and a p-value of 0.112 for long term debt, which is not significant (although possibly influenced by the number of cells with low counts).<sup>10</sup> The findings follow a similar pattern to those for the Mann-Whitney tests with the total debt being of greater significance.

<sup>10</sup> If the levels of debt-to-equity are simply split into two, above and below 100%, chi-square tests for differences between the companies give p-values of 0.000 for total debt and 0.053 for long term debt. Hence regardless of the split, greater significance is observed for total debt in the tests (and supported in the Mann-Whitney tests).

Table 5.4 displays the level of debt for companies capitalising different types of intangible assets.

**TABLE 5.4: PERCENTAGES OF TOTAL DEBT-TO-EQUITY FOR COMPANIES CAPITALISING DIFFERENT TYPES OF INTANGIBLE ASSETS**

Total Debt-to-Equity	Companies Capitalising Both Goodwill and OIA		Companies Capitalising Goodwill Only		Companies Capitalising OIAs Only	
	No.	%	No.	%	No.	%
Greater than 500%	2	6	4	11	0	0
200% to 500%	5	16	5	13	1	8
100% to 200%	12	39	11	30	3	23
50% to 100%	5	16	9	24	3	23
Less than 50%	7	23	8	22	6	46
<b>Total</b>	<b>31</b>	<b>100</b>	<b>37</b>	<b>100</b>	<b>13</b>	<b>100</b>

For those companies with debt-to-equity percentages of more than 200 percent, the number of companies capitalising goodwill only is just higher than those companies who capitalise both types of intangibles, but in the over 500 percent category the companies capitalising goodwill only stand out. Where debt-to-equity is over 100 percent, 61 percent of companies capitalise goodwill with other intangibles compared to 54 percent capitalising goodwill on its own. Overall it appears that those companies with higher debt levels are capitalising goodwill with or without other intangibles and there is less likelihood overall that a high debt company will capitalise intangibles without including goodwill.

Observation of Table 5.4 suggests that the distribution of companies capitalising only intangibles other than goodwill is different from that of companies capitalising only goodwill, and a Mann-Whitney test for differences in total debt-to-equity between these companies supports this, being significant at 4.19 percent.

## 5.4 – Intangible Asset Capitalisation Levels and Debt

Table 5.5 gives the number of companies categorised by levels of intangible asset capitalisation (through intangible assets as a percentage of total assets) and debt levels (through debt to equity percentages). This is to see whether companies that have a large proportion of asset value in intangibles also have high debt levels, indicating that capitalised intangibles are helping leverage.

**TABLE 5.5: NUMBERS OF COMPANIES AT DIFFERENT LEVELS OF INTANGIBLE ASSET CAPITALISATION AND DEBT**

IA/TA%	Level of Debt (Debt-to-Equity %)				Total
	Very High (> 200%)	High (100%-200%)	Medium (50% - 100%)	Low (< 50%)	
Greater than 50%	1	2	1	6	10
Between 20% and 50%	4	5	5	6	20
Between 5% and 20%	2	5	4	4	15
Between 0% and 5%	10	14	7	5	36
<b>Total</b>	<b>17</b>	<b>26</b>	<b>17</b>	<b>21</b>	<b>81</b>

*IA/TA% = Intangibles assets as a percentage of total assets*

The table shows that the majority of companies with high debt levels have the lowest capitalisation rate, so although capitalising companies have higher debt levels than non-capitalising companies, for over 50 percent of companies in the high debt level category intangible assets represent only a small proportion of total asset value. A total of 12 companies (15 percent) are in both the higher levels of debt (over 100 percent) and the higher contribution to asset range (over 20 percent) suggesting that capitalising is not making a big impact on leverage for the large majority of companies. A chi-square test for association between the level of debt and the level of contribution by capitalisation to asset value was not significant (p-value of 0.115).

Table 5.6 is similar to Table 5.5 but gives a breakdown by type of intangible asset capitalised. This shows that the majority of companies in the higher debt levels capitalise both goodwill and other intangibles but within these debt levels, where contribution to asset value is lowest, companies capitalising only goodwill

dominate. Goodwill is capitalised as a result of corporate acquisition and hence the element of choice over whether to capitalise or not is not as great as might be the case for some other types of intangible assets (especially if companies are capitalising internally generated assets). So for a large number of companies with higher debt levels the findings suggest that capitalisation is not closely linked to leverage considerations.

**TABLE 5.6: NUMBERS OF COMPANIES AT DIFFERENT LEVELS AND TYPES OF INTANGIBLE ASSET CAPITALISATION AND DEBT**

IA/TA%	Level of Debt (Debt-to-Equity %)											
	Very High (> 200%)			High (100% - 200%)			Medium (50% - 100%)			Low (< 50%)		
	B	GW	OIA	B	GW	OIA	B	GW	OIA	B	GW	OIA
Greater than 50%	1	-	-	2	-	-	-	1	-	4	-	2
Between 20% and 50%	3	-	1	3	1	1	2	1	2	1	5	-
Between 5% and 20%	1	1	-	2	3	-	1	2	1	1	1	2
Between 0% and 5%	2	8	-	5	7	2	2	5	-	1	2	2
<b>Total</b>	<b>7</b>	<b>9</b>	<b>1</b>	<b>12</b>	<b>11</b>	<b>3</b>	<b>5</b>	<b>9</b>	<b>3</b>	<b>7</b>	<b>8</b>	<b>6</b>

*IA/TA% = Intangibles assets as a percentage of total assets*  
*B = Companies capitalising both Goodwill and Other Intangible Assets*  
*GW = Companies capitalising Goodwill only*  
*OIA = Companies capitalising Other Intangible Assets only*

One of the incentives to capitalise intangible assets at value rather than cost might be motivated by leverage, so Table 5.7 repeats Table 5.5 for just the 12 companies that capitalise other intangibles at value. (Note that for these assets debt-to-equity percentages do not exceed 200 percent, hence only the High level category is used.)

**TABLE 5.7: NUMBERS OF COMPANIES AT DIFFERENT LEVELS OF CAPITALISATION AND DEBT FOR INTANGIBLES CAPITALISED AT VALUE**

IA/TA%	Level of Debt (Debt-to-Equity %)		
	High (> 100%)	Medium (50% - 100%)	Low (< 50%)
Greater than 50%	1	-	4
Between 20% and 50%	-	2	1
Between 5% and 20%	-	2	2
Between 0% and 5%	-	-	-
<b>Total</b>	<b>1</b>	<b>4</b>	<b>7</b>

*IA/TA% = Intangibles assets as a percentage of total assets*

Over 50 percent of the companies in this category have low debt levels and only one company has a high debt level along with a high contribution to asset value. This would again support the suggestion that capitalisation is not closely linked to leverage considerations.

It is worth noting, however, that these findings reflect a point in time, the 2000 year, and that the picture might have been different at the time the intangible assets were first capitalised. So the lack of close linkage between debt levels and capitalisation at this point in time does not rule out the possibility that initial capitalisation was linked to leverage considerations.

### **5.5 – The Effect of Capitalisation on Debt-to-Equity**

The previous section examines level of debt using reported equity. From the information it seems that whilst capitalisation is associated with leverage, in that capitalising companies have higher levels of debt than non-capitalising companies, companies that have a high level of contribution from capitalisation to assets do not tend to be high debt companies.

However, another aspect to consider is what contribution intangible asset capitalisation is having when it comes to the debt-to-equity levels, because removal of the effect of capitalisation will decrease equity. Table 5.8 shows the

debt-to-equity after removal of capitalised intangibles from equity. This table includes a 'less than 0 percent' category and eight companies come into this categorisation meaning that the removal of intangible assets from equity has made equity negative, a possible outcome where the proportion of intangible to total assets is high.

**TABLE 5.8: TOTAL DEBT-TO-EQUITY (EXCLUDING CAPITALISED INTANGIBLES)**

D/(E-IA)%	Companies Capitalising Both Goodwill and OIA		Companies Capitalising Goodwill Only		Companies Capitalising OIAs Only		Total	
	No.	%	No.	%	No.	%	No.	%
Greater than 500%	3	10	6	16	0	0	9	11
200% to 500%	8	26	6	16	1	8	15	19
100% to 200%	7	23	11	30	2	15	20	25
50% to 100%	6	19	9	24	4	31	19	23
0% to 50%	2	6	4	11	4	31	10	12
Less than 0%	5	16	1	3	2	15	8	10
<b>Total</b>	<b>31</b>	<b>100</b>	<b>37</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>81</b>	<b>100</b>

D/(E-IA) = Debt- to-Equity excluding Intangible Assets

Table 5.9 gives descriptive statistics for change in debt-to-equity percentages from inclusion to exclusion of intangibles in equity. Excluding intangible assets from equity increases the average debt-to-equity percentage by 177 percent (with a more modest change in the median), indicating a wide range of change across the 81 companies with increases in 73 of those companies.

**TABLE 5.9: DESCRIPTIVE STATISTICS FOR TOTAL DEBT-TO-EQUITY PERCENTAGES**

	Mean	Median	Lower Quartile	Upper Quartile	Overall Range
<b>Total Debt-to-Equity</b>					
Including Capitalised intangibles	186	109	48	173	3473
Excluding Capitalised intangibles	267	121	54	226	12419
<b>Change</b>					
Actual Change	80	11	1	69	12514
Relative Change (%)	177	11	1	73	6417

### **5.6 - Amortisation Practices**

Over half the companies capitalising goodwill in the high debt companies use an amortisation period of more than 10 years (usually specified as 20), with two companies not specifying any time period and one stating that amortisation is over the period of expected benefits.

There are 23 high debt companies (with debt-to-equity over 100 percent) capitalising other intangibles. (As seen from Table 5.4, 19 of these companies capitalise both goodwill and other intangibles and 4 capitalise other intangibles only.) Of these 23 companies, six do not specify an amortisation period, and five do not amortise. Where the amortisation period is specified, only three companies specify a maximum amortisation period of 10 years or less. Hence lengthy amortisation periods (or none at all) may be helping to keep asset value on the balance sheet.

### **5.7 - Summary of Chapter Findings**

Overall, companies that capitalise intangible assets have greater relative levels of debt (measured through debt-to-equity percentages) than non-capitalising companies.

However amongst the capitalising companies those with the highest debt levels are for the most part companies capitalising goodwill (with or without other intangibles) whilst companies capitalising solely other intangible assets do not tend to have higher levels of debt. The effect of the removal of capitalised intangibles from equity influences debt-to-equity percentages quite considerably for some companies.

When the contribution by capitalisation to the total asset value is considered, companies with higher levels of debt tend to have a lower contribution to value and the majority of companies in this lower contribution level capitalise goodwill only.

Capitalising intangibles at value rather than at cost does not seem to be linked to leverage as most of these companies are in the lower debt categories (although, as stated earlier, the situation might have been different at the time the asset first appeared on the balance sheet).

Overall there is little evidence that the amount of capitalisation and leverage considerations might be linked for the majority of companies. However, the choice by high debt companies of lengthy amortisation time periods, or lack of any amortisation, might well be influenced by leverage considerations.

## ***Chapter Six – Capitalised Intangible Assets and Market Value***

### **6.1 - Introduction**

As discussed in Chapter Three, many investigations outside New Zealand find that intangible assets are value relevant – i.e. they impact on market value. Hence the intention is to find out whether this also applies to New Zealand companies.

This chapter explores the first part of the third objective in this study and reports on some initial background work focusing on market value and market-to-book ratios. Section 6.2 covers the methodology, with the findings reported in Sections 6.3 and 6.4 and concluding with a summary in Section 6.5.

### **6.2 – Methodology for Objective Three (Part 1)**

#### **6.2.1 – Objective Three**

*To investigate the value relevance of intangible asset capitalisation for New Zealand companies.*

#### **6.2.2 – Market-to-book ratios**

The association between market and book value of equity for the companies is examined and correlation coefficients and descriptive statistics for market-to-book

ratios<sup>11</sup> are compared for capitalising and non-capitalising companies to highlight any differences. A Mann-Whitney test is conducted for difference in market-to-book ratios between capitalising and non-capitalising companies.

In addition, the descriptive statistics for the ratios for capitalising companies, where capitalised intangibles are removed from the book value of equity, are included. This adjustment indicates the extent to which the intangible asset capitalisation affects the difference between market and book values. (However, all following analysis uses the unadjusted market-to-book ratios.)

The market-to-book ratios are divided into six categories based on value range, which are then classified into three levels: High (where the ratio is above 2), Medium (where the ratio is between 1 and 2) and Low (where the ratio is below 1). The number of capitalising and non-capitalising companies in these categories is compared to see the spread across the categories, and the association is tested using a chi-square test. Finally, the level of intangible asset contribution across market-to-book ratios for capitalising companies is examined to see whether larger differences between market and book values can be associated with greater intangible capitalisation, an association again tested using a chi-square test.

### **6.2.3 – Market Value and Other Factors**

As discussed in Chapter Three, other factors may have an influence on market value. In this chapter the relationships between these factors and market value and market-to-book equity ratios are considered.

One of these factors is debt. In Chapter Five, debt is examined because of its possible motivational effect for capitalisation. The three other factors considered

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<sup>11</sup> Whereas researchers such as Penman (1996) follow finance theory and determine market-to-book ratios using a determination of market price based on the present value of expected future dividends, reflecting expected future returns on equity; for the purposes of this study market-to-book reflects the difference between market and accounting values for a company.

are ownership diversity, industry capitalisation level and size. In Chapter Three these are discussed because of information asymmetry and the possible effect on market value. In this chapter the focus of interest is whether there is an observable difference between different levels of these factors in relation to both market values and market-to-book ratios.

For each factor only two levels are used and the split is made at a logical point for each factor as described below, taking into consideration the factor itself and the number of companies in each level, ensuring that the split is not too uneven.

All four factors are examined with respect to market value, tabling numbers and percentages of companies in each category. Mann-Whitney tests for each factor are carried out to see if there is a difference in market values between companies with different factor levels. Chi-square tests are also conducted for the tabled data to determine any association between levels of market value and each factor.

The number of companies in each factor level with respect to market-to-book ratios in the six size categories is then tabled. Using the levels of small, medium and large for market-to-book with factor levels, chi-square tests for association are conducted. Mann-Whitney tests are also conducted for differences in market-to-book ratios over the factor levels.

The factors are split as follows:

#### Debt

As in Chapter Five, debt-to-equity is used as a measure of the relative level of debt, and the companies are divided between two levels, in this case high (debt-to-equity is 100% or more) and low (debt-to-equity is less than 100 percent).

#### Ownership diversity

Ownership diversity in this study is based on the percentage of shares held in holdings of 10 percent or more. (This is one of the recognized groups of "corporate insiders" as per the US 1934 Securities and Exchange Act.) The split

is between companies that have more than 50 percent of their shares in these holdings, indicating lesser diversity in ownership, and those that have less than 50 percent indicating greater diversity.

#### Industry capitalisation level

Industry capitalisation level is based on the percentage of companies within the industry sectors that capitalise intangible assets. The split comes between those sectors where there is a 75 percent or higher capitalisation rate and those whose capitalisation rate is less than 75 percent, because this is the level at which the division in numbers would be as even as possible.

#### Size

At the beginning of the study companies are split into size categories of small, medium and large. However in this section of the study, the 81 companies are split into large and small, with the dividing market value being the median for capitalising companies of \$100.581 million.

### **6.3 – Market and Book Values of Equity**

The association between equity market and book values for companies is high, with a correlation coefficient of 0.89 for the total 134 companies as well as for the 53 non-capitalising companies, and with a slightly higher correlation coefficient of 0.90 for the 81 capitalising companies.

The descriptive statistics for the ratios of equity market-to-book value are in Table 6.1 and highlight the fact that capitalising companies have higher ratios than non-capitalising companies. A Mann-Whitney test for difference between market-to-book ratios for capitalising and non-capitalising companies is significant at 0.3 percent.

When the effect of capitalised intangibles is removed, the ratios are much higher. Hence it appears that whilst there is greater discrepancy between market and

book values of equity for capitalising companies, capitalisation obviously reduces this discrepancy quite considerably.

**TABLE 6.1: DESCRIPTIVE STATISTICS FOR MARKET-TO-BOOK VALUE OF EQUITY**

	Market-to-Book Ratios				
	Mean	Median	Standard Deviation	Lower Quartile	Upper Quartile
Total 134 companies	2.35	1.20	4.38	0.80	2.16
53 non-capitalising companies	1.74	1.03	3.20	0.61	1.58
81 capitalising companies	2.74	1.52	4.98	0.91	2.63
	Ratios Excluding Capitalised Intangibles from Book Value of Equity				
	Mean	Median	Standard Deviation	Lower Quartile	Upper Quartile
81 capitalising companies	6.06	1.87	17.95	0.89	4.34

Table 6.2 gives different levels and ranges of equity market-to-book ratios for capitalising and non-capitalising companies. Nearly half (49 percent) of the non-capitalising companies fall into the lowest level (where market value is actually less than book value) compared with 41 percent of the capitalising companies. However at the higher end, where the market value is more than double the book value, non-capitalising companies have only 21 percent (11 companies) in this category compared to 32 percent (26 companies) for capitalising companies.

It is interesting, too, to note that 58 percent (31 companies) of the non-capitalising companies have a market value within  $\pm 50$  percent of the book value, whereas for capitalising companies the percentage of companies within this range is lower at 41 percent (33 companies), so market value for non-capitalising companies has a greater tendency to be closer to book value.

Capitalising companies have a wider spread of market-to-book values overall. A chi-square test for association is significant at 5 percent (p-value of 0.032) indicating that there is a difference in the overall spread of market-to-book values between capitalising and non-capitalising companies.

**TABLE 6.2: NUMBER OF COMPANIES AT DIFFERENT LEVELS OF MARKET-TO-BOOK EQUITY RATIOS**

Type of Company	Level and Value Range of MV/BV						Total
	High		Medium		Low		
	> 2.5	2.0 – 2.5	1.5 – 2.0	1.0 – 1.5	0.5 – 1.0	< 0.5	
<b>Capitalising</b>	23	3	15	15	18	7	<b>81</b>
<b>Non-capitalising</b>	8	3	2	14	17	9	<b>53</b>

*MV/BV = Market-to-Book value of equity*  
*High = Ratio for MV/BV is greater than 2*  
*Medium = Ratio for MV/BV lies between 1 and 2*  
*Low = Ratio for MV/BV is less than 1*

The extent of capitalisation for the different levels of market-to-book ratios, seen in Table 6.3, shows that not quite half (12) of the companies at the highest level have intangibles representing over 20 percent of total asset value compared to 33 percent (10 companies) and 32 percent (8 companies) for the medium and low ratio levels. However use of a chi-square test based on levels indicates that there is no significant difference in association between the levels of capitalisation and market-to-book ratios (p-value of 0.537).

**TABLE 6.3: NUMBER OF COMPANIES AT DIFFERENT LEVELS OF INTANGIBLE ASSET CAPITALISATION AND MARKET-TO-BOOK EQUITY RATIOS**

IA/TA%	Level and Value Range of MV/BV						Total
	High		Medium		Low		
	> 2.5	2.0 – 2.5	1.5 – 2.0	1.0 – 1.5	0.5 – 1.0	< 0.5	
Greater than 50%	1	1	3	2	2	1	<b>10</b>
Between 20% and 50%	10	0	2	3	3	2	<b>20</b>
Between 5% and 20%	3	1	3	4	2	2	<b>15</b>
Between 0% and 5%	9	1	7	6	11	2	<b>36</b>
<b>Total</b>	<b>23</b>	<b>3</b>	<b>15</b>	<b>15</b>	<b>18</b>	<b>7</b>	<b>81</b>

*IA/TA% = Intangibles assets as a percentage of total assets*  
*MV/BV = Market-to-Book value of equity*  
*High = Ratio for MV/BV is greater than 2*  
*Medium = Ratio for MV/BV lies between 1 and 2*  
*Low = Ratio for MV/BV is less than 1*

Overall, where NZSE-listed companies capitalise intangible assets, there is a greater likelihood of market value being greater than book value than is the case for non-capitalising companies, and the increment above book value is, on

average, greater. Hence greater intangible asset capitalisation does not seem to contribute to closer alignment of market and book values – in fact the reverse appears to be the case. Thus, on the one hand, the suggestion that intangibles should be capitalised to more closely reflect the true value of the business can be supported, in that if the effect of capitalisation is removed this would obviously make market-to-book ratios greater. But use of book value to gain some idea of market value does not appear to be supported, because there is still a wide discrepancy between values. Consequently it can be argued that whilst capitalisation brings market and book values closer, in reality capitalisation does not appear to be contributing to a significant decrease in information asymmetry.

#### 6.4 – Factors and Capitalising Companies

Table 6.4 splits the companies above and below the median market value for ownership diversity, industry capitalisation level and debt level. The table shows that higher market value companies have greater ownership diversity, are in the higher industry capitalisation bracket and have higher debt levels than companies with lower market values. Whilst chi-square tests for association between the levels for each factor and market value do not support any statistically significant differences, the Mann-Whitney test for differences in market values for different factor levels is significant only for debt at 4.43 percent.

**TABLE 6.4: LEVELS OF MARKET VALUE FOR 81 CAPITALISING COMPANIES**

Market Value	Factor											
	Ownership Diversity				Industry Capitalisation				Debt Level			
	Greater		Lesser		High		Low		High		Low	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
≥ median	26	55	15	44	22	52	19	49	24	56	17	45
< median	21	45	19	56	20	48	20	51	19	44	21	55
<b>Total</b>	<b>47</b>		<b>34</b>		<b>42</b>		<b>39</b>		<b>43</b>		<b>38</b>	

Table 6.5 reflects the breakdown for the market-to-book equity ratios (this time including size as a factor). Where the market is valuing companies considerably

above their book value (where market-to-book ratios are greater than 2.5), the companies have greater ownership diversity, a larger size, greater debt levels and are greater industry capitalisers of intangibles.

However, using chi-square tests for association between factor levels and market-to-book equity levels (high, medium and low), produces a significant finding only for size (p-value of 0.006) with a finding for ownership diversity just outside the significance level of 10 percent (p-value of 0.108). Mann-Whitney tests for differences in market-to-book ratios for different factor levels produce similar findings with significance for size at 0.01 percent and for ownership diversity at 6.14 percent.

**TABLE 6.5: MARKET-TO-BOOK EQUITY RATIOS FOR 81 FACTORED COMPANIES**

Market to Book Ratios	Ownership Diversity		Industry Capitalisation		Size		Debt Level	
	Greater	Lesser	High	Low	Large	Small	High	Low
> 2.5	17	6	13	10	18	5	13	10
2.0 – 2.5	2	1	1	2	2	1	1	2
1.5 – 2.0	9	6	7	8	8	7	8	7
1.0 – 1.5	8	7	6	9	6	9	7	8
0.5 – 1.0	8	10	11	7	7	11	11	7
< 0.5	3	4	4	3	0	7	3	4
<b>Total</b>	<b>47</b>	<b>34</b>	<b>42</b>	<b>39</b>	<b>41</b>	<b>40</b>	<b>43</b>	<b>38</b>

In relation to ownership diversity, the findings here appear to be contrary to those of Steiner (1996) because for these NZSE-listed companies there is greater ownership diversity in the companies that are more highly valued by the market, as indicated by the high market values and the very high market-to-book ratios. However the greater ownership diversity means the likelihood of lower information asymmetry (Hogan, Olson and Kish, 2001) and a market perception of value that is based on factors other than corporate book value, such as earnings or additional disclosures.

Smaller size has been associated with greater information asymmetry (McLaughlin et al., 1998). Not many of the smaller sized NZSE-listed companies

come within the high market-to-book category. This might support greater information asymmetry because it is suggesting that smaller companies are more easily valued and have a market value closer to book value - however it is also noticeable that nearly half the small companies have market values that are less than book value, indicating difficulty in valuation at the lower end.

Industry capitalisation rate has produced varied results in literature (Amir and Lev, 1996; Collins et al., 1997; Goodwin, 2001) as discussed in Chapter Three. For the NZSE-listed companies in this study, the largest number of companies comes within the high industry capitalisation level with high market values, although the distinction is not as great as for the other factors. Also 50 percent of the companies in both the high and low industry capitalisation categories have a market-to-book equity ratio of over 1.5. Hence it has to be stated that no definitive conclusions can be drawn on the relationship between market value and industry capitalisation.

There is no apparent difference between high and low debt level companies based on market-to-book ratios, which seems to indicate that debt levels are not influential in market valuation. However, there is significant difference in market value, and consequently size, between high and low debt level companies. High debt is associated with larger companies and low debt with smaller companies. This would follow from the findings that high debt companies are those capitalising goodwill (Chapter Five) and these goodwill capitalising companies tend to be in the larger size categories (Chapter Four).

## **6.5 – Summary of Chapter Findings**

Capitalising companies have greater differences between market and book values of equity than non-capitalising companies. However these differences are modified to some extent by the capitalising process – the differential being far greater if capitalised intangibles are removed from equity.

Where capitalisation of intangibles is high (more than 20 percent of total asset value) there is a greater tendency for the market-to-book ratios to be high. However where capitalisation is very low, the number of companies in the high, medium and low levels of market-to-book ratios is more evenly distributed. Whilst capitalisation is bringing market and book values closer, there is still an apparent gap. This may be attributable to information asymmetry or simply conservatism in accounting, in that the market may be attaching a value to intangible assets that are not being valued by the accountant.

The largest differences between market and book values are found in capitalising companies that have greater ownership diversity and a larger size, with no clear conclusions reached on the rate of industry capitalisation and levels of debt. With the apparent difference between market and book values, there is a strong likelihood that the market is using indicators other than capitalised intangibles to determine value. One of these is earnings forecasts, but knowledge of uncapitalised intangibles could also be a possibility. Whether this is the case or not for these companies could be the subject of a further study.

## ***Chapter Seven – Modelling for Market Value***

### **7.1 - Introduction**

Following the examination of market-to-book values for the 134 companies in Chapter Six, this chapter examines value relevance of capitalised intangibles, proposing hypotheses and using modelling to test these.

To evaluate the value relevance of capitalised intangible assets, this study adopts a similar approach to a variety of models used in this area. Early valuation modelling, as reviewed by Barth (2000), is either earnings based or assets and liabilities based, regressing these on stock price. Ohlson (1995) regresses stock prices on earnings plus book value in work then extended by others such as Collins, Maydew and Weiss (1997), Francis and Schipper (1999) and Lev and Zarowin (1999), as discussed in Chapter Three.

Intangible assets have been separated out in value relevance work such as that by Abrahams and Sidhu (1998), who regress market value on assets, liabilities and capitalised R&D costs; and Barth and Clinch (1998) who, using a model incorporating both balance sheet and income items, separate intangible assets between those recorded at cost and those that have been revalued.

In this study the investigation focuses on the contribution of capitalised intangibles to an estimation of market value, so the models are balance sheet based and do not include earnings related items. Examples of this type of model are Choi, Kwon and Lobo (2000) who regress market value on assets, liabilities and intangible assets and Godfrey and Koh (2001) who separate out intangible assets into goodwill, capitalised R&D and other identifiable intangible assets.

Section 7.2 covers the methodology for the second part of the third objective, stating the hypotheses tested and the models used. Findings are given in Sections 7.3 to 7.6, and conclude with a chapter summary in Section 7.7.

## **7.2 – Methodology for Objective Three (Part 2)**

### **7.2.1 – Objective Three**

*To investigate the value relevance of intangible asset capitalisation for New Zealand companies.*

### **7.2.2 – Value Relevance Hypotheses**

There are two groups of hypotheses. The first series tests whether intangible asset variables are significantly related to market value i.e. are value relevant. Initially the value relevance of capitalised intangible assets in total is tested and the hypothesis is:

H1a: Total intangible assets capitalised are value relevant.

Then to test whether intangible assets are value relevant if broken into type – goodwill or other, and then capitalised at cost or at value – the following hypotheses are tested:

H1b: Goodwill and Other Capitalised Intangibles are each value relevant.

H1c: Intangible assets capitalised at cost and intangible assets capitalised at value are each value relevant.

The second series tests whether capitalised intangible assets have explanatory power incremental to other balance sheet items (such as tangible assets and liabilities) in explaining company value.

H2a: Total intangible assets have incremental explanatory power above other assets and liabilities.

H2b: Goodwill has incremental explanatory power above other assets and liabilities.

H2c: Other capitalised intangible assets have incremental explanatory power above other assets and liabilities.

H2d: Intangible assets capitalised at cost have incremental explanatory power above other assets and liabilities.

H2e: Intangible assets capitalised at value have incremental explanatory power above other assets and liabilities.

### **7.2.3 – Regression Modelling for Value Relevance**

In the models, market value of equity is expressed as a function of balance sheet variables to assess the relative contributions of intangible assets towards explaining market value information. To test whether, for NZSE-listed companies, investors place value on different aspects of intangible asset capitalisation, the models use total intangible assets; then a breakdown between goodwill and other intangibles; and finally a breakdown between intangible assets capitalised at cost or at value.

Market value used is the value at the fiscal year end (used by authors such as Barth and Clinch (1998)). For the purposes of this study, market value at the fiscal year end is preferred to the alternative of the value three months after balance date, because the models are balance sheet based and do not include the effect of earnings. If market value is taken at a time period later than balance date the value could well be influenced by earnings announcements.

It is recognised, however, that the New Zealand Stock Market can be very volatile and that market value can change quite considerably over a short period of time. A limitation in this modelling is that the market value is taken at a particular point in time, and this may not be truly representative of the value ascribed by the market. In order to determine whether the choice of balance date might result in a completely different outcome, the first models used are rerun using the market value three months post balance date. The findings are very similar to those using year end market value and hence the choice of balance date for share price does not seem to be unreasonable.

## The Models

**Model 1** does not consider the effects of intangible assets on the market value and hence is regarded as a base model for comparative purposes.

$$\text{Model 1: } MV = \alpha_0 + \alpha_1 \text{BVM} + \alpha_2 \text{PPE} + \alpha_3 \text{LIAB} + \varepsilon \quad (1)$$

where: MV is the market value of equity measured at the fiscal year end  
BVM is book value of total assets excluding property, plant and equipment *and* intangible asset value (if there is one);  
PPE is the book value of property, plant and equipment  
LIAB is the book value of liabilities  
 $\varepsilon$  is the error term.

**Model 2** introduces the effects of total intangible assets on the market value.

$$\text{Model 2: } MV = \alpha_0 + \alpha_1 \text{BVM} + \alpha_2 \text{PPE} + \alpha_3 \text{LIAB} + \alpha_4 \text{IA} + \varepsilon \quad (2)$$

where: IA is the book value of intangible assets (if stated);  
with the remaining variables as in Model 1.

**Model 3** splits capitalised intangible assets into goodwill and other intangible assets.

$$\text{Model 3: } MV = \alpha_0 + \alpha_1 \text{BVM} + \alpha_2 \text{PPE} + \alpha_3 \text{LIAB} + \alpha_4 \text{GW} + \alpha_5 \text{OIA} + \varepsilon \quad (3)$$

where: GW is goodwill;  
OIA is other intangible assets;  
with the remaining variables as in Model 1

**Model 4** differentiates between intangible assets capitalised at value and those capitalised at cost.

$$\text{Model 4: } MV = \alpha_0 + \alpha_1 \text{BVM} + \alpha_2 \text{PPE} + \alpha_3 \text{LIAB} + \alpha_4 \text{IA}_C + \alpha_5 \text{IA}_R + \varepsilon \quad (4)$$

where:  $\text{IA}_C$  is intangible assets at cost  
 $\text{IA}_R$  is intangible assets at value  
with the remaining variables as in Model 1

These models are used to test the H1 series through the significance of variable coefficients using t-tests, and hence to evaluate the value relevance of the capitalised intangibles. The H2 series is tested using F-tests when variables are added incrementally to a block of existing variables.

To mitigate the effects of heteroscedasticity raised by Easton (1998) when he criticises the use of scaling through use of variables on a per share basis, each of the variables used is scaled using the year-end book value of total assets as per Jennings et al. (1996).

The models used in this study are tested to ensure they fitted the assumptions of regression analysis<sup>12</sup> and as some other studies use a different scaling instrument (e.g. opening book values used by Choi et al. (2000) and opening market value used by Cahan, Courtenay, Gronwoller and Upton (2000)), scaling using different scaling instruments (firstly with share price and secondly with opening market value of shares held in the 2000 financial year) is applied to the basic model to see if the outcomes are similar. Similar outcomes are found, although the alternative scaling processes give models with some indications of heteroscedasticity, more pronounced when opening market value rather than share price is used as a scaling instrument.

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<sup>12</sup> The residuals are normally distributed, have a homogeneous variance and are independent.

#### **7.2.4 – The Data for Regression Modelling**

Companies that do not have any property, plant and equipment disclosed on the balance sheet (15 in all) are removed from the total of 134 companies for regression modelling purposes, leaving 119 companies. (None of the 15 companies removed capitalise intangible assets and nearly all are investment companies.)

Regression model assumptions are then tested and outliers eliminated to ensure that the models fit the assumptions of regression analysis. This results in a final total of 109 companies, 73 capitalising companies and 36 non-capitalising.

#### **7.2.5 – Companies Differentiated by Type of Capitalisation**

To determine whether the hypothesised outcomes are the same for companies capitalising different types of intangibles, the 73 capitalising companies are split into the following groups based on different combinations of capitalised intangible assets (where OIAs represents Other Intangible Assets, as in the models):

- Companies capitalising goodwill (with or without OIAs)
- Companies capitalising OIAs (with or without goodwill)
- Companies capitalising both goodwill and OIAs
- Companies capitalising only goodwill
- Companies capitalising only OIAs

Models 1 to 3 are rerun for each group. In addition, for companies capitalising goodwill (with or without OIAs), an additional model is run, Model 3a. This model includes OIAs (if present) in the book value of total assets and shows only the effect of the goodwill as a separate variable. A similar model, Model 3b, is run for companies capitalising OIAs (with or without goodwill) that retains goodwill (if present) in the book value of assets.

These variations on Model 3 are:

$$\text{Model 3a: } MV = \alpha_0 + \alpha_1 \text{BVR} + \alpha_2 \text{PPE} + \alpha_3 \text{GW} + \alpha_4 \text{LIAB} + \varepsilon \quad (3a)$$

$$\text{Model 3b: } MV = \alpha_0 + \alpha_1 \text{BVS} + \alpha_2 \text{PPE} + \alpha_3 \text{OIA} + \alpha_4 \text{LIAB} + \varepsilon \quad (3b)$$

where:            BVR is the book value of total assets excluding property, plant and equipment *and* goodwill (retaining OIAs if they are present);  
                      BVS is the book value of total assets minus property, plant and equipment *and* OIAs (retaining goodwill if it is present).

In each case the outcomes for Models 1, 2 and 3 (with variations where appropriate) are compared, although where companies capitalise either goodwill or other intangibles, but not both, there are no Model 2 comparisons. Model 4 is not used in this section, although in assessing the incremental power of the variables the effect of total intangible assets capitalised at cost and at value is determined.

No more outliers are eliminated for these combination models, although model assumptions are tested in each case and found to be satisfactory.

### **7.3 – Reporting the Results for the Value Relevance Models**

The findings in each instance are presented through pairs of tables. The first table in the pair presents the results of the modelling and tests the hypotheses in the H1 series. The reported p-values for the coefficients are single-tailed, based on the prediction that all coefficients, with the exception of liabilities, are positive.

The second table in the pair presents the results of testing the incremental power of variables added to a base model and tests hypotheses in the H2 series. The incremental test results are based on F-tests and are reported significant or otherwise at specified levels of significance.

## 7.4 – Results for all 109 Companies

Tables 7.1.1 and 7.1.2 cover the four models for all 109 companies. Table 7.1.1 shows that the addition of intangible assets into the model improves the explanatory power for market value indicated by the increase in the adjusted coefficient of determination ( $R^2$ ) between Model 1 and Model 2. All capitalised intangibles, regardless of type, are significant variables in the models, so all the hypotheses of value relevance in the H1 series are supported.

**TABLE 7.1.1: MARKET VALUE REGRESSION MODELS FOR ALL COMPANIES**

Variables	Model 1 coefficient (p-value)	Model 2 coefficient (p-value)	Model 3 coefficient (p-value)	Model 4 coefficient (p-value)
Intercept	3.036 (0.000)	2.564 (0.000)	2.543 (0.000)	2.564 (0.000)
BVM	0.930 (0.000)	1.066 (0.000)	1.061 (0.000)	1.062 (0.000)
LIAB	-0.599 (0.008)	-1.002 (0.000)	-0.999 (0.000)	-0.995 (0.000)
PPE	1.280 (0.000)	1.364 (0.000)	1.366 (0.000)	1.361 (0.000)
IA	-	1.263 (0.000)	-	-
IA <sub>C</sub>	-	-	-	1.236 (0.000)
IA <sub>R</sub>	-	-	-	1.318 (0.002)
GW	-	-	1.453 (0.000)	-
OIA	-	-	1.101 (0.001)	-
F-statistic (p-value)	53.58 (0.000)	58.82 (0.000)	48.84 (0.000)	48.57 (0.000)
N	109	109	109	109
Adjusted R <sup>2</sup>	0.659	0.726	0.725	0.724
Std. Error of Estimate	0.612	0.548	0.549	0.550

The addition of various independent variables to a base model (Table 7.1.2) results in significance in the incremental power of the variables added and the H2 hypotheses of incremental explanatory power are all supported.

However when goodwill and OIAs are split then goodwill has greater value relevance than OIAs as the incremental addition of goodwill is significant at a 0.1 percent level of significance, whereas for OIAs, incremental addition is significant at a 1 percent level. Intangible assets at cost are slightly more value relevant than those capitalised at value.

**TABLE 7.1.2: INCREMENTAL EXPLANATORY POWER OF VARIABLES FOR ALL COMPANIES**

<b>Base Independent Variables</b>	<b>Additional Independent Variables</b>	<b>F-test</b>
BVM, PPE, LIAB	IA	26.92*
BVM, PPE, LIAB	GW	15.36*
BVM, PPE, LIAB, OIA	GW	15.31*
BVM, PPE, LIAB	OIA	10.48**
BVM, PPE, LIAB, GW	OIA	10.47**
BVM, PPE, LIAB	IAC	16.08*
BVM, PPE, LIAB, IAr	IAC	16.56*
BVM, PPE, LIAB	IAr	8.82**
BVM, PPE, LIAB, IAC	IAr	9.34**

\* *p-value < 0.001*  
\*\* *p-value < 0.01*

## 7.5 – Separating Capitalising and Non-Capitalising Companies

In Table 7.2.1 a difference between capitalising and non-capitalising companies is highlighted. For the non-capitalising companies the explanatory power in the model is greater than the same model for the capitalising companies but this increases once intangible assets are incorporated into the model. Once again the models support the H1 series hypotheses – all capitalised intangibles are value relevant.

**TABLE 7.2.1: MARKET VALUE REGRESSION MODELS FOR CAPITALISING AND NON-CAPITALISING COMPANIES**

Variables	Non-capitalising Companies	Capitalising Companies			
	Model 1 coefficient (p-value)	Model 1 coefficient (p-value)	Model 2 coefficient (p-value)	Model 3 coefficient (p-value)	Model 4 coefficient (p-value)
Intercept	3.279 (0.002)	3.029 (0.001)	2.226 (0.002)	2.179 (0.003)	2.225 (0.002)
BVM	1.165 (0.000)	0.954 (0.000)	1.075 (0.000)	1.067 (0.000)	1.066 (0.000)
LIAB	-1.679 (0.002)	-0.466 (0.064)	-0.866 (0.001)	-0.863 (0.001)	-0.847 (0.002)
PPE	1.598 (0.000)	1.267 (0.000)	1.310 (0.000)	1.317 (0.000)	1.302 (0.000)
IA	-	-	1.192 (0.000)	-	-
IA <sub>C</sub>	-	-	-	-	1.135 (0.000)
IA <sub>R</sub>	-	-	-	-	1.305 (0.001)
GW	-	-	-	1.392 (0.000)	-
OIA	-	-	-	1.025 (0.001)	-
F-statistic (p-value)	22.87 (0.000)	33.79 (0.000)	41.96 (0.000)	34.85 (0.000)	34.54 (0.000)
N	36	73	73	73	73
Adjusted R <sup>2</sup>	0.708	0.642	0.737	0.736	0.734
Std. Error of Estimate	0.623	0.592	0.507	0.509	0.511

Table 7.2.2 once again suggests that, incrementally, goodwill gives more information about market value than OIAs, and intangibles capitalised at cost are more value relevant than those capitalised at value. However all H2 series hypotheses are supported.

**TABLE 7.2.2: INCREMENTAL EXPLANATORY POWER OF VARIABLES FOR COMPANIES CAPITALISING INTANGIBLE ASSETS**

<b>Base Independent Variables</b>	<b>Additional Independent Variables</b>	<b>F-test</b>
BVM, PPE, LIAB	IA	25.86*
BVM, PPE, LIAB	GW	14.29*
BVM, PPE, LIAB, OIA	GW	15.63*
BVM, PPE, LIAB	OIA	8.80**
BVM, PPE, LIAB, GW	OIA	10.30**
BVM, PPE, LIAB	IAC	13.43*
BVM, PPE, LIAB, IAr	IAC	15.16*
BVM, PPE, LIAB	IAr	8.72**
BVM, PPE, LIAB, IAC	IAr	10.39**

\* *p-value < 0.001*  
 \*\* *p-value < 0.01*

## 7.6 – Companies Differentiated by Type of Capitalisation

### 7.6.1 – Variations

Here it is of interest to see whether value relevance is affected when categorising the companies by virtue of the type of intangibles capitalised.

## 7.6.2 - Companies Capitalising Goodwill

Tables 7.3.1 and 7.3.2 relates to companies that capitalise goodwill and utilise Model 3a. Table 7.3.1 indicates that Model 3a makes no difference to the findings. H1a and H1b, hypothesising value relevance for total intangible assets, goodwill and OIAs, are supported.

**TABLE 7.3.1: MARKET VALUE REGRESSIONS FOR COMPANIES CAPITALISING GOODWILL**

Variables	Model 1 coefficient (p-value)	Model 2 coefficient (p-value)	Model 3 coefficient (p-value)	Model 3a coefficient (p-value)
Intercept	3.065 (0.001)	2.442 (0.001)	2.343 (0.001)	2.357 (0.001)
BVM	0.938 (0.000)	1.118 (0.000)	1.083 (0.000)	-
BVR	-	-	-	1.073 (0.000)
PPE	1.147 (0.001)	1.204 (0.000)	1.201 (0.000)	1.192 (0.000)
LIAB	-0.474 (0.067)	-0.933 (0.001)	-0.894 (0.001)	-0.888 (0.001)
IA	-	1.271 (0.000)	-	-
GW	-	-	1.460 (0.000)	1.452 (0.000)
OIA	-	-	0.987 (0.006)	-
F-statistic (p-value)	28.80 (0.000)	42.50 (0.000)	35.46 (0.000)	43.28 (0.000)
N	60	60	60	60
Adjusted R <sup>2</sup>	0.650	0.776	0.775	0.779
Std. Error of Estimate	0.537	0.430	0.430	0.427

**TABLE 7.3.2: INCREMENTAL EXPLANATORY POWER OF VARIABLES FOR COMPANIES CAPITALISING GOODWILL**

<b>Base Independent Variables</b>	<b>Additional Independent Variables</b>	<b>F-test</b>
BVM, PPE, LIAB	IA	32.49*
BVM, PPE, LIAB	GW	23.96*
BVM, PPE, LIAB, OIA	GW	23.23*
BVM, PPE, LIAB	OIA	7.14**
BVM, PPE, LIAB, GW	OIA	6.78***
BVM, PPE, LIAB	IAC	21.40*
BVM, PPE, LIAB, IAr	IAC	23.58*
BVM, PPE, LIAB	IAr	5.92***
BVM, PPE, LIAB, IAC	IAr	7.86**
BVR, PPE, LIAB	GW	23.65*

\* *p-value < 0.001*

\*\* *p-value < 0.01*

\*\*\* *p-value < 0.05*

As expected, Table 7.3.2 shows that OIAs have less significance incrementally as a predictor in the model than goodwill and the same can be said for intangible assets capitalised at value compared to cost. As goodwill is capitalised at cost for every company, this outcome is to be expected. However the H2 series of hypotheses, for explanatory power of additional intangible variables, are all supported.

### 7.6.3 - Companies Capitalising Other Intangible Assets

Tables 7.4.1 and 7.4.2 give the findings for companies capitalising OIAs. From Table 7.4.1 it can be seen that whilst all the individual variables are significant predictors in the models at a 10 percent level (supporting value relevance hypothesised in H1a and H1b), some are quite close to not being significant. Once again, incorporating the Model 3 variation (Model 3b) makes no difference to the findings.

**TABLE 7.4.1: COMPANIES CAPITALISING OIAs**

Variables	Model 1 coefficient (p-value)	Model 2 coefficient (p-value)	Model 3 coefficient (p-value)	Model 3b coefficient (p-value)
Intercept	2.371 (0.019)	2.106 (0.020)	2.105 (0.021)	2.090 (0.020)
BVM	1.127 (0.001)	1.204 (0.000)	1.198 (0.000)	-
BVS	-	-	-	1.223 (0.000)
PPE	1.296 (0.007)	1.476 (0.001)	1.490 (0.001)	1.495 (0.001)
LIAB	-0.274 (0.287)	-0.845 (0.040)	-0.826 (0.045)	-0.837 (0.040)
IA	-	1.002 (0.002)	-	-
GW	-	-	1.323 (0.012)	-
OIA	-	-	0.811 (0.031)	0.820 (0.028)
F-statistic (p-value)	19.31 (0.000)	21.24 (0.000)	17.53 (0.000)	21.64 (0.000)
N	39	39	39	39
Adjusted R <sup>2</sup>	0.653	0.722	0.718	0.726
Std. Error of Estimate	0.666	0.595	0.600	0.591

Although all the companies capitalise OIAs in addition to goodwill, goodwill is the more significant predictor (Tables 7.4.1 and 7.4.2). However as OIAs are the only intangible assets capitalised at value rather than cost, Table 7.4.2 shows, for the first time, that intangible assets capitalised at value is a more significant predictor than those capitalised at cost. All the H2 series are supported.

**TABLE 7.4.2: INCREMENTAL EXPLANATORY POWER OF VARIABLES FOR COMPANIES CAPITALISING OIAs**

<b>Base Independent Variables</b>	<b>Additional Independent Variables</b>	<b>F-test</b>
BVM, PPE, LIAB	IA	9.73**
BVM, PPE, LIAB	GW	5.89***
BVM, PPE, LIAB, OIA	GW	5.67***
BVM, PPE, LIAB	OIA	4.77***
BVM, PPE, LIAB, GW	OIA	3.73****
BVM, PPE, LIAB	IAC	3.27****
BVM, PPE, LIAB, IAr	IAC	3.82****
BVM, PPE, LIAB	IAr	5.54***
BVM, PPE, LIAB, IAC	IAr	6.07***
BVS, PPE, LIAB	OIA	3.96****

*\* p-value < 0.001*  
*\*\* p-value < 0.01*  
*\*\*\* p-value < 0.05*  
*\*\*\*\* p-value < 0.10*

#### **7.6.4 - Companies with Both Goodwill and OIAs Present**

Tables 7.5.1 and 7.5.2 cover companies capitalising both goodwill and OIAs. Table 7.5.1 supports the findings of Tables 7.3 and 7.4 (and the support for value relevance hypothesised in H1a and H1b). For these companies, OIAs is significant as a predictor only at the 10 percent level, with goodwill contributing more to the model.

**TABLE 7.5.1: MARKET VALUE REGRESSION MODELS FOR COMPANIES WITH BOTH GOODWILL AND OIAs**

Variables	Model 1 coefficient (p-value)	Model 2 coefficient (p-value)	Model 3 coefficient (p-value)
Intercept	2.496 (0.022)	2.525 (0.007)	2.448 (0.009)
BVM	1.123 (0.004)	1.356 (0.000)	1.307 (0.001)
PPE	1.157 (0.066)	1.456 (0.012)	1.458 (0.013)
LIAB	-0.321 (0.302)	-1.129 (0.023)	-1.050 (0.035)
IA	-	1.164 (0.001)	-
GW	-	-	1.408 (0.004)
OIA	-	-	0.883 (0.050)
F-statistic (p-value)	12.69 (0.000)	18.85 (0.000)	15.41 (0.000)
N	26	26	26
Adjusted R <sup>2</sup>	0.643	0.774	0.769
Std. Error of Estimate	0.615	0.489	0.495

**TABLE 7.5.2: INCREMENTAL EXPLANATORY POWER OF VARIABLES FOR COMPANIES CAPITALISING BOTH GOODWILL AND OIAs**

Base Independent Variables	Additional Independent Variables	F-test
BVM, PPE, LIAB	IA	13.85*
BVM, PPE, LIAB	GW	10.06**
BVM, PPE, LIAB, OIA	GW	9.01**
BVM, PPE, LIAB	OIA	3.63****
BVM, PPE, LIAB, GW	OIA	3.00****
BVM, PPE, LIAB	IAC	6.86***
BVM, PPE, LIAB, IAr	IAC	8.53**
BVM, PPE, LIAB	IAr	3.45****
BVM, PPE, LIAB, IAC	IAr	5.04***

\* p-value < 0.001  
\*\* p-value < 0.01  
\*\*\* p-value < 0.05  
\*\*\*\* p-value < 0.10

Table 7.5.2 shows goodwill as being a more significant predictor incrementally than OIAs. Similarly, intangible assets capitalised at cost is more significant as a predictor than at valuation. (Once again the incremental explanatory power of the variables hypothesised in the H2 series is supported.)

#### 7.6.5 - Companies Capitalising Goodwill or OIAs (but not both)

Tables 7.6.1, 7.6.2 and 7.6.3 cover Models 1 and 3 for companies that capitalise either goodwill or OIAs. (No Model 2 is necessary here as the total intangible assets is equivalent to either the total goodwill or the total OIAs.)

**TABLE 7.6.1: MARKET VALUE REGRESSION MODELS FOR COMPANIES CAPITALISING EITHER GOODWILL OR OIAs (BUT NOT BOTH)**

Variables	Goodwill Only Companies		OIAs Only Companies	
	Model 1 coefficient (p-value)	Model 3 coefficient (p-value)	Model 1 coefficient (p-value)	Model 3 coefficient (p-value)
Intercept	4.083 (0.005)	0.445 (0.387)	2.803 (0.242)	1.783 (0.344)
BVM	0.877 (0.002)	1.013 (0.000)	0.975 (0.120)	1.040 (0.117)
PPE	1.125 (0.001)	1.032 (0.001)	1.086 (0.126)	1.200 (0.117)
LIAB	-0.594 (0.059)	-0.846 (0.006)	0.450 (0.356)	0.052 (0.485)
GW	-	1.931 (0.001)	-	-
OIA	-	-	-	0.651 (0.268)
F-statistic (p-value)	16.87 (0.000)	23.00 (0.000)	5.36 (0.017)	4.09 (0.019)
N	34	34	13	13
Adjusted R <sup>2</sup>	0.651	0.770	0.573	0.543
Std. Error of Estimate	0.474	0.390	0.854	0.883

Table 7.6.1 indicates that where companies have only goodwill as a capitalised intangible asset, the predictive power of the model is better if goodwill is included as a predictor, and goodwill is a significant incremental addition to the model

(Table 7.6.2). H1b for the value relevance for goodwill and H2b for incremental explanatory power are therefore supported.

**TABLE 7.6.2: INCREMENTAL EXPLANATORY POWER OF VARIABLES FOR COMPANIES CAPITALISING ONLY GOODWILL**

Base Independent Variables	Additional Independent Variables	F-test
BVM, PPE, LIAB	GW (or IA or IAc)	15.32*

*\* p-value < 0.001*

**TABLE 7.6.3: INCREMENTAL EXPLANATORY POWER OF VARIABLES FOR COMPANIES CAPITALISING ONLY OIAs**

Base Independent Variables	Additional Independent Variables	F-test
BVM, PPE, LIAB	OIA	0.42
BVM, PPE, LIAB	IAc	0.38
BVM, PPE, LIAB	IAR	1.50

*F-test results are all insignificant*

Model 3 for the 13 OIAs companies is significant at a 2 percent level, but most of the variables are not significant. H1b for value relevance of total OIAs is not supported and neither (as per the outcome of Table 7.6.3) is H2c, H2d and H2e, for the incremental explanatory power for OIAs and intangibles capitalised at cost and value. The conclusion could be that capitalisation of OIAs by these companies is not significant, but it could also be concluded that the sample size here is too small and therefore the tests lack sufficient power.

## 7.7 – Summary of Chapter Findings

Overall only the companies capitalising solely OIAs are not found to support the hypotheses. (Although, as previously stated, the finding for this one exception may be attributable to small sample size).

All the models are value relevant, so it is concluded that for these NZSE-listed companies, intangible assets, however expressed, contribute to the explanation of market value. Although the significance of incremental additions varies, with a tendency for goodwill to be more value relevant than other capitalised intangible assets and intangible assets capitalised at cost of greater value relevance than those capitalised at value, all intangible assets are significant additions to the models.

## ***Chapter Eight – Factors and Intangible Asset Capitalisation***

### **8.1 - Introduction**

In Chapter Six, the relationships between market value and the four factors of ownership diversity, industry capitalisation level, size and debt level are examined.

In this chapter these factors are separately incorporated into the modelling introduced in Chapter Seven, to see whether the value relevance of capitalised intangibles is influenced when these factors are taken into consideration. The purpose of incorporating the factors into the modelling is to expand on the findings of both Chapters Six and Seven. The modelling in this chapter uses the same divisions for factor levels as used in Chapter Six.

Chapter Eight therefore covers the third and final part of the third objective. Section 8.2 covers the methodology used in the modelling, with Sections 8.3 to 8.8 reporting the results. Section 8.9 concludes the chapter with a summary of findings.

### **8.2 – Methodology for Objective Three (Part 3)**

#### **8.2.1 – Objective Three**

***To investigate the value relevance of intangible asset capitalisation for New Zealand companies.***

## 8.2.2 – Modelling taking factors into consideration

For each factor, the 73 companies are split between the two factor levels, according to the criteria stated in Chapter Six, and Models 1 to 4, as specified in Chapter Seven, are run on the split company data. Although the split factor models cannot be directly compared, within each model the significance of the intangible variables is of interest.

Initially, however, Models 2 to 4 are run for the full 73 companies in an interactive format using the factor of interest (expressed as an indicator or dummy variable of 0 or 1 for the two levels of the factor), in addition to an interaction between the factor and the intangible variable(s) of interest. This is to determine whether the variable of interest is significant in predicting market value when interacted with the factor.

The interactive models take the form:

Model 2<sub>INT</sub>:

$$MV = \alpha_0 + \alpha_1 BVM + \alpha_2 PPE + \alpha_3 LIAB + \alpha_4 IA + \alpha_5 X + \alpha_6 IA * X + \varepsilon$$

Model 3<sub>INT</sub>:

$$MV = \alpha_0 + \alpha_1 BVM + \alpha_2 PPE + \alpha_3 LIAB + \alpha_4 GW + \alpha_5 OIA + \alpha_6 X + \alpha_7 GW * X + \alpha_8 OIA * X + \varepsilon$$

Model 4<sub>INT</sub>:

$$MV = \alpha_0 + \alpha_1 BVM + \alpha_2 PPE + \alpha_3 LIAB + \alpha_4 IA_C + \alpha_5 IA_R + \alpha_6 X + \alpha_7 IA_C * X + \alpha_8 IA_R * X + \varepsilon$$

where: X represents the factor of interest  
Variable\*X represents the interaction between the factor of interest and the capitalised intangible asset variable (total intangibles for Model 2<sub>INT</sub>; goodwill and OIAs (other intangible assets) for Model 3<sub>INT</sub>; and intangibles at cost and value for Model 4<sub>INT</sub>).

If the outcomes of these models have interactive variables that are not significant (determined from the p-values of the variable coefficients), the model is then

rerun excluding these, and where there are no significant interactive variables, the interactive model is discarded.

The predicted sign for each of the factors is based on the information gained by tabulating company size and factor level for the 73 companies, seen in the Appendix, Table I.

### **8.3 – Reporting Results**

Initially, findings from the interactive modelling are reported through the p-values for the coefficients of the intangible asset variables in the models, to determine whether these are significant at a 10 percent level. From these findings for each factor, the appropriateness of an interactive model and the variables to be included, is determined.

The findings for the split models (and interactive models where applicable) are then reported based on t-tests for the variable coefficients with the focus being on the intangible variables of interest in respect of the factor and the implications of the modelling.

Where interactive models are used they are simply reported in the tables under the heading of the model number. For example Model 3<sub>INT</sub> is reported under Model 3, with the subheading of 'Full Data INT', denoting that this is an interactive model using all 73 companies.

### **8.4 – Outcomes from the Full Interactive Modelling**

Table 8.1 reports the p-values for the coefficients of the intangible assets in the interactive models for each factor.

**TABLE 8.1: SIGNIFICANCE OF VARIABLES FROM INTERACTIVE FACTOR MODELS**  
(REPORTED USING P-VALUES OF THE VARIABLE COEFFICIENTS IN THE REGRESSION MODEL)

	Variables	Factor			
		Ownership Diversity	Industry Capitalisation	Size	Debt Level
<b>Model 2<sub>INT</sub></b>	Factor	NS (0.435)	NS (0.382)	S (0.018)	NS (0.127)
	IA	S (0.000)	S (0.000)	S (0.001)	S (0.000)
	IA*Factor	S (0.035)	NS (0.372)	NS (0.137)	NS (0.410)
<b>Model 3<sub>INT</sub></b>	Factor	NS (0.378)	NS (0.378)	S (0.023)	NS (0.129)
	GW	S (0.000)	S (0.013)	S (0.059)	S (0.001)
	OIA	S (0.009)	S (0.021)	S (0.005)	S (0.009)
	GW*Factor	S (0.001)	NS (0.407)	S (0.026)	NS (0.497)
	OIA*Factor	NS (0.353)	NS (0.390)	NS (0.455)	NS (0.477)
<b>Model 4<sub>INT</sub></b>	Factor	NS (0.292)	NS (0.430)	S (0.020)	NS (0.131)
	IA <sub>C</sub>	S (0.000)	S (0.001)	S (0.051)	S (0.001)
	IA <sub>R</sub>	S (0.072)	NS (0.106)	S (0.002)	S (0.006)
	IA <sub>C</sub> *Factor	S (0.000)	NS (0.127)	S (0.048)	NS (0.392)
	IA <sub>R</sub> *Factor	S (0.054)	NS (0.154)	NS (0.331)	NS (0.461)

IA = Total intangible assets

GW = Goodwill

OIA = Other identifiable intangibles

IA<sub>C</sub> = Intangible assets at cost

IA<sub>R</sub> = Intangible assets at value

S = Significant (at a 10% level of significance)

NS = Not Significant

The p-values indicate that no interactive variables are significant for industry capitalisation and debt levels; hence only split model results are reported for these factors.

For ownership diversity, total intangible assets (Model 2<sub>INT</sub>), goodwill (Model 3<sub>INT</sub>) and intangibles both at cost and value (Model 4<sub>INT</sub>) have significant interactions; and for size, goodwill (Model 3<sub>INT</sub>) and intangible assets at cost (Model 4<sub>INT</sub>) have significant interactions.

## 8.5 - Ownership Diversity

For ownership diversity, the outcome in Table 8.1 indicates that interactive variables in all three models are significant, with the only exception being OIAs in Model 3<sub>INT</sub>. So the output in Tables 8.2.1 and 8.2.2 shows the interactive model results for the 73 companies (under Full Data INT), with the split results reported

under LD (lesser ownership diversity, assigned a dummy variable of 1) and GD (greater ownership diversity, assigned a dummy variable of 0). The coefficients for the interactive variables are predicted to be negative because market value is higher for companies with greater ownership diversity.

**TABLE 8.2.1: MARKET VALUE REGRESSION MODELS USING OWNERSHIP DIVERSITY AS A FACTOR**

Variables	Model 1 coefficient (p-value)		Model 2 coefficient (p-value)		
	Split Data		FULL	Split Data	
	LD (1)	GD (0)		LD (1)	GD (0)
Intercept	3.705 (0.027)	2.713 (0.005)	2.339 (0.001)	1.291 (0.262)	2.407 (0.002)
BVM	1.122 (0.001)	0.777 (0.009)	1.029 (0.000)	1.376 (0.000)	0.794 (0.001)
LIAB	-0.727 (0.074)	-0.302 (0.236)	-0.845 (0.002)	-1.335 (0.009)	-0.588 (0.035)
PPE	1.256 (0.003)	1.420 (0.002)	1.291 (0.000)	1.460 (0.001)	1.292 (0.000)
IA	-	-	1.660 (0.000)	0.984 (0.015)	1.597 (0.000)
Ownership	-	-	0.027 (0.435)	-	-
IA*Ownership	-	-	-0.961 (0.035)	-	-
F-statistic (p-value)	14.18 (0.000)	19.03 (0.000)	32.18 (0.000)	14.15 (0.000)	33.57 (0.000)
N	32	41	73	32	41
Adjusted R <sup>2</sup>	0.622	0.638	0.749	0.673	0.799
Std. Error of Estimate	0.588	0.612	0.496	0.547	0.456

**TABLE 8.2.2: MARKET VALUE REGRESSION MODELS USING OWNERSHIP AS A FACTOR**

Variables	Model 3 coefficient (p-value)			Model 4 coefficient (p-value)		
	Full Data INT	Split Data		Full Data INT	Split Data	
		LD (1)	GD (0)		LD (1)	GD (0)
Intercept	2.640 (0.000)	2.341 (0.134)	2.612 (0.001)	2.644 (0.000)	1.741 (0.187)	2.709 (0.000)
BVM	1.085 (0.000)	1.487 (0.000)	0.880 (0.000)	1.020 (0.000)	1.303 (0.000)	0.878 (0.000)
LIAB	-0.998 (0.000)	-1.579 (0.003)	-0.749 (0.007)	-0.928 (0.001)	-1.195 (0.013)	-0.786 (0.006)
PPE	1.255 (0.000)	1.498 (0.001)	1.262 (0.000)	1.199 (0.000)	1.331 (0.001)	1.236 (0.000)
GW	2.860 (0.000)	0.361 (0.269)	2.700 (0.000)	-	-	-
OIA	1.032 (0.001)	1.659 (0.005)	0.951 (0.004)	-	-	-
IA <sub>C</sub>	-	-	-	2.597 (0.000)	0.660 (0.072)	2.499 (0.000)
IA <sub>R</sub>	-	-	-	0.659 (0.072)	2.195 (0.003)	0.684 (0.051)
Ownership	0.077 (0.281)	-	-	0.082 (0.292)	-	-
GW*Ownership	-2.602 (0.001)	-	-	-	-	-
IA <sub>C</sub> /Ownership	-	-	-	-2.199 (0.000)	-	-
IA <sub>R</sub> /Ownership	-	-	-	1.325 (0.054)	-	-
F-statistic (p-value)	33.23 (0.000)	12.83 (0.000)	35.51 (0.000)	31.15 (0.000)	13.68 (0.000)	35.34 (0.000)
N	73	32	41	73	32	41
Adjusted R <sup>2</sup>	0.779	0.689	0.835	0.788	0.704	0.834
Std. Error of Estimate	0.465	0.533	0.413	0.456	0.520	0.414

The results from Tables 8.2.1 and 8.2.2 highlight a difference in the LD and GD models. This is strongest in Model 3, in that whilst goodwill is significant for companies with less ownership diversity, it is not a significant predictor for companies with greater ownership diversity.

The interactions of ownership diversity with total intangible assets, goodwill, intangible assets at cost and at value are significant (although for assets at value, significance is only at a 10 percent level). This supports differences in the value relevance of capitalised intangibles between companies with different levels of ownership diversity, although goodwill is the only intangible asset that is not at all value relevant at one level, namely in companies with less ownership diversity.

Investigation of why goodwill stands out highlights the fact that the average amount of goodwill for companies with less ownership diversity is nearly half that of the companies with more diverse ownership, and, as discovered in Chapter Four, goodwill represents a smaller percentage of total capitalised intangibles.

In addition companies with less diversity in ownership tend to be smaller in size (see Table 6.4 in Chapter 6), with 44 percent of these companies having market values below book values (compared to 27 percent of companies with greater ownership diversity), so are less highly valued by the market. Smaller size and less ownership diversity are both associated with increased information asymmetry (Jensen and Meckling, 1976; Chari, Jagannathan and Ofer, 1988; Scherr and Hulbert, 2001; Barth and Kasznik, 1999), but Steiner (1996) states that companies with less ownership diversity should be more highly valued by the market. For these companies, as mentioned in Chapter Six, this does not appear to be the case.

There might be various reasons for this. These companies could simply be lower growth companies, hence not valued highly by the market; making fewer and less profitable acquisitions and hence are smaller with a lower level of goodwill. One aspect that has not been considered is the age of the companies. If companies are relatively new then they may well be small and not have established their credibility in the marketplace. A more in-depth analysis of these companies could provide an extension of the current study.

Intangible assets at cost, whilst significant at both levels of ownership diversity, shows greater significance for those companies with less ownership diversity.

(With goodwill capitalised at cost, these two variables are naturally linked, so similarity in the findings is to be expected.)

## 8.6 – Industry Capitalisation Levels

Using industry capitalisation levels, none of the interactive variables are significant so the results reported in Tables 8.3.1 and 8.3.2 are for the split models only. In these split models HC represents companies in industry sectors with high capitalisation rates (assigned a dummy variable of 1) and LC represents companies in industry sectors with low capitalisation rates (assigned a dummy variable of 0).

**TABLE 8.3.1: MARKET VALUE REGRESSION MODELS USING INDUSTRY SECTOR AS A FACTOR**

Variables	Model 1 coefficient (p-value)		Model 2 coefficient (p-value)	
	Split Data		Split Data	
	HC (1)	LC (0)	HC (1)	LC (0)
Intercept	7.841 (0.006)	2.567 (0.004)	1.536 (0.323)	2.235 (0.004)
BVM	0.547 (0.072)	1.085 (0.000)	0.825 (0.009)	1.190 (0.000)
LIAB	-0.298 (0.243)	-0.399 (0.216)	-0.692 (0.044)	-0.906 (0.029)
PPE	1.360 (0.002)	1.146 (0.006)	1.403 (0.001)	1.200 (0.002)
IA	-	-	1.118 (0.002)	1.418 (0.001)
F-statistic (p-value)	12.36 (0.000)	22.49 (0.000)	14.59 (0.000)	25.90 (0.000)
N	36	37	36	37
Adjusted R <sup>2</sup>	0.558	0.699	0.654	0.771
Std. Error of Estimate	0.586	0.595	0.519	0.520

**TABLE 8.3.2: MARKET VALUE REGRESSION MODELS USING INDUSTRY SECTOR AS A FACTOR**

Variables	Model 3 coefficient (p-value)		Model 4 coefficient (p-value)	
	Split Data		Split Data	
	HC (1)	LC (0)	HC (1)	LC (0)
Intercept	1.606 (0.319)	2.198 (0.006)	-0.448 (0.449)	2.147 (0.005)
BVM	0.825 (0.010)	1.181 (0.000)	0.748 (0.016)	1.210 (0.000)
LIAB	-0.694 (0.046)	-0.898 (0.033)	-0.551 (0.086)	-1.014 (0.019)
PPE	1.399 (0.001)	1.205 (0.002)	1.346 (0.001)	1.236 (0.002)
GW	1.315 (0.004)	1.536 (0.018)	-	-
OIA	0.932 (0.026)	1.315 (0.018)	-	-
IA <sub>C</sub>	-	-	0.931 (0.009)	1.916 (0.002)
IA <sub>R</sub>	-	-	2.015 (0.003)	0.845 (0.096)
F-statistic (p-value)	12.01 (0.000)	20.96 (0.000)	13.19 (0.000)	22.17 (0.000)
N	36	37	36	37
Adjusted R <sup>2</sup>	0.647	0.764	0.670	0.774
Std. Error of Estimate	0.524	0.527	0.506	0.516

The tables show that intangible assets are equally significant as predictors for companies in both levels of industry capitalisation in Model 2, but, in Model 3, goodwill is a slightly more significant predictor in the higher capitalisation companies than the lower, although still significant in both.

Overall, whether companies fall into a high or low industry capitalisation level does not influence the market value relevance of capitalised intangible assets. This is not surprising because in Chapter Six (Tables 6.4 and 6.5) there is not a great deal of difference in both market value and market-to-book values for companies in industries with high and low levels of capitalisation. As stated in Chapter Six, the industry capitalisation rate of companies with respect to market

value has produced varied results in literature (Amir and Lev, 1996; Collins et al., 1997; Goodwin, 2001). The outcome in this study may simply reflect the way the companies are categorised based on *existing* capitalisation, but not recognising the fact that the market may well be considering uncapitalised intangibles when it comes to valuation (Barth and Kasznik, 1999; Aboody and Lev, 2000).

## 8.7 - Company Size

The interactive models resulting from the earlier findings are reported under 'Full Data INT' for 73 companies. (There is no interactive Model 2<sub>INT</sub>; Model 3<sub>INT</sub> excludes other identifiable intangibles; and Model 4<sub>INT</sub> excludes intangible assets at value.)

The split models are reported under large (assigned a dummy variable of 1) and small (assigned a dummy variable of 0). The coefficients for the interactive variables are predicted to be positive with a higher market value corresponding to larger companies.

Tables 8.4.1 and 8.4.2 show that both goodwill and intangible assets at cost have less significance for smaller companies. This finding is supported in the outcome for the interactive models, where the interactions with both goodwill and intangible assets at cost are significant.

Consequently, size is influential in the market value relevance of goodwill and intangible assets at cost for capitalising companies. From Chapter Four (Table 4.6) it is seen that goodwill (always capitalised at cost) has a higher representation in larger companies, hence the outcome here is not surprising. Larger companies tend to have decreased information asymmetry and hence the value of capitalised goodwill may have greater credibility in the market.

**TABLE 8.4.1: MARKET VALUE REGRESSION MODELS USING SIZE AS A FACTOR**

Variables	Model 1 coefficient (p-value)		Model 2 coefficient (p-value)	
	Split Data		Split Data	
	Large (1)	Small (0)	Large (1)	Small (0)
Intercept	99.370 (0.056)	3.564 (0.000)	77.930 (0.000)	2.986 (0.000)
BVM	0.302 (0.152)	0.795 (0.002)	0.721 (0.004)	0.821 (0.001)
LIAB	0.020 (0.476)	-0.397 (0.157)	-0.664 (0.019)	-0.593 (0.049)
PPE	0.776 (0.006)	0.733 (0.062)	0.987 (0.000)	0.806 (0.029)
IA	-	-	1.321 (0.000)	0.812 (0.002)
F-statistic (p-value)	45.98 (0.000)	21.27 (0.000)	59.84 (0.000)	23.98 (0.000)
N	36	37	36	37
Adjusted R <sup>2</sup>	0.833	0.687	0.891	0.756
Std. Error of Estimate	0.438	0.505	0.354	0.446

**TABLE 8.4.2: MARKET VALUE REGRESSION MODELS USING SIZE AS A FACTOR**

Variables	Model 3 coefficient (p-value)			Model 4 coefficient (p-value)		
	Full Data INT	Split Data		Full Data INT	Split Data	
		Large (1)	Small (0)		Large (1)	Small (0)
Intercept	3.072 (0.000)	75.68 (0.000)	3.076 (0.000)	3.031 (0.000)	79.71 (0.000)	3.052 (0.000)
BVM	1.008 (0.000)	0.718 (0.005)	0.813 (0.001)	1.046 (0.000)	0.688 (0.008)	0.775 (0.001)
LIAB	-0.926 (0.000)	-0.650 (0.022)	-0.553 (0.064)	-0.957 (0.000)	-0.628 (0.030)	-0.434 (0.109)
PPE	0.963 (0.000)	0.980 (0.000)	0.727 (0.049)	0.974 (0.000)	0.974 (0.000)	0.625 (0.067)
GW	0.653 (0.056)	1.554 (0.001)	0.581 (0.079)	-	-	-
OIA	0.987 (0.001)	1.160 (0.003)	1.005 (0.004)	-	-	-
IA <sub>C</sub>	-	-	-	0.562 (0.048)	1.232 (0.002)	0.439 (0.087)
IA <sub>R</sub>	-	-	-	1.272 (0.001)	1.474 (0.003)	1.457 (0.001)
Size	0.306 (0.014)	-	-	0.300 (0.020)	-	-
GW*Size	1.432 (0.023)	-	-	-	-	-
IA <sub>C</sub> *Size	-	-	-	1.032 (0.039)	-	-
F-statistic (p-value)	33.75 (0.000)	49.20 (0.000)	19.79 (0.000)	33.27 (0.000)	48.55 (0.000)	22.06 (0.000)
N	73	36	37	73	36	37
Adjusted R <sup>2</sup>	0.782	0.889	0.753	0.780	0.888	0.774
Std. Error of Estimate	0.462	0.357	0.449	0.465	0.359	0.430

## 8.8 – Debt Level

Debt level, as with industry capitalisation level, has only split models reported, with high debt companies assigned a dummy variable of 1 and low debt companies assigned a dummy variable of 0.

Tables 8.5.1 and 8.5.2 show that all capitalised intangibles in the models are significant for the low debt companies only, and are not significant for high debt companies. It suggests that where debt is high the market does not consider capitalised intangibles as a significant component of value. This may be because the market is more wary of the valuation attached to those intangible assets, placing greater reliance on the tangible assets (as suggested might happen by Wong and Wong (2001)). What is interesting in these high debt models is that property, plant and equipment is the only significant variable, which would support this conclusion. It might also indicate that valuation may be more dependent on non-balance sheet information, such as earnings, an aspect that could be further investigated.

**TABLE 8.5.1: MARKET VALUE REGRESSION MODELS USING DEBT LEVEL AS A FACTOR**

Variables	Model 1 coefficient (p-value)		Model 2 coefficient (p-value)	
	Split Data		Split Data	
	High Debt (1)	Low Debt (0)	High Debt (1)	Low Debt (0)
Intercept	2.416 (0.002)	2.184 (0.098)	2.455 (0.002)	-0.052 (0.486)
BVM	0.180 (0.266)	1.282 (0.000)	0.317 (0.215)	1.348 (0.000)
LIAB	0.045 (0.452)	0.364 (0.268)	-0.149 (0.391)	-1.260 (0.155)
PPE	1.236 (0.001)	0.488 (0.152)	1.300 (0.001)	0.631 (0.056)
IA	-	-	0.263 (0.309)	1.257 (0.001)
F-statistic (p-value)	28.05 (0.000)	19.62 (0.000)	22.03 (0.000)	26.48 (0.000)
N	40	33	40	33
Adjusted R <sup>2</sup>	0.730	0.693	0.724	0.794
Std. Error of Estimate	0.415	0.655	0.419	0.536

**TABLE 8.5.2: MARKET VALUE REGRESSION MODELS USING DEBT LEVEL AS A FACTOR**

Variables	Model 3 coefficient (p-value)		Model 4 coefficient (p-value)	
	Split Data		Split Data	
	High Debt (1)	Low Debt (0)	High Debt (1)	Low Debt (0)
Intercept	2.456 (0.002)	-0.104 (0.472)	2.425 (0.002)	-0.052 (0.487)
BVM	0.317 (0.218)	1.359 (0.000)	1.242 (0.279)	1.345 (0.000)
LIAB	-0.149 (0.393)	-0.295 (0.287)	-0.045 (0.468)	-0.231 (0.329)
PPE	1.299 (0.001)	0.655 (0.054)	1.280 (0.001)	0.608 (0.068)
GW	0.279 (0.392)	1.372 (0.002)	-	-
OIA	0.259 (0.324)	1.138 (0.009)	-	-
IA <sub>C</sub>	-	-	0.030 (0.480)	1.167 (0.004)
IA <sub>R</sub>	-	-	0.826 (0.164)	1.401 (0.005)
F-statistic (p-value)	17.83 (0.000)	21.42 (0.000)	18.35 (0.000)	21.42 (0.000)
N	40	33	40	33
Adjusted R <sup>2</sup>	0.716	0.788	0.722	0.788
Std. Error of Estimate	0.426	0.426	0.421	0.544

The outcome for the modelling (both general and interactive) is interesting, and demands some further investigation into underlying information. Hence Table 8.6 is constructed as an adaptation of Table 5.5 (in Chapter Five), but using only the 73 companies used in the regression modelling. This table categorises companies according to the level of debt and the contribution made by intangible asset capitalisation to total assets. It highlights the fact that over half the companies with higher debt-to-equity ratios have the lowest contributions made by capitalised intangibles to total asset value (compared to only one-third of companies with lower debt-to-equity ratios). It is quite possible that this low contribution could be a reason for the lack of value relevance of capitalised intangibles in the high debt models.

**TABLE 8.6: NUMBER OF COMPANIES AT DIFFERENT LEVELS OF INTANGIBLE ASSET CAPITALISATION AND DEBT**

IA/TA%	Level of Debt (Debt-to-Equity %s)		Total
	High ( $\geq 100\%$ )	Low ( $< 100\%$ )	
Greater than 50%	3	7	10
Between 20% and 50%	9	7	16
Between 5% and 20%	7	8	15
Between 0% and 5%	21	11	32
<b>Total</b>	<b>40</b>	<b>33</b>	<b>73</b>

*IA/TA% = Intangibles assets as a percentage of total assets*

The suggested explanation<sup>13</sup> for the lack of significance in the interactive variables is that the dominance of the effect of the low debt companies obliterates the effect of the high debt companies in the combined data models, resulting in interactive variables that do not reflect the difference.

## 8.9 – Summary of Chapter Findings

This chapter seeks to extend the findings of Chapters Six and Seven by using the factors introduced in Chapter Six and observing whether they have any influence on the value relevance models used in Chapter Seven.

The findings indicate that categorisation of companies into an industry sector that has a high or low rate of intangible capitalisation is not influential on the value relevance of those capitalised intangibles. However, this may well be due to the fact that categorisation is based on *existing* capitalised intangibles rather than potential, or uncapitalised, intangibles.

The diversity of ownership structure is influential, in that for companies with less ownership diversity, goodwill is not value relevant (and intangible assets at cost exhibit less value relevance in these companies, although still significant). In

<sup>13</sup> An opinion was sought from a statistical expert in the interpretation of this outcome because it seemed so contrary to expectation, and this suggested explanation comes from Dr Jennifer Holden (Department of Statistics at the University of Auckland).

addition smaller companies have less value relevance for both goodwill and intangible assets capitalised at cost. Whilst small companies with less ownership diversity have increased information asymmetry, and therefore less credibility attached to the valuation of goodwill by the marketplace, the findings might also be attributable to the lower representation of goodwill capitalised in companies with less ownership diversity and of smaller size.

Finally, there is a complete lack of value relevance for capitalised intangible assets for high debt companies, possibly a consequence of the market utilizing information other than that provided by the balance sheet to determine value for high debt companies. However the outcome could also be attributed to the low level of contribution capitalisation makes to asset value in high debt companies.

So whilst the findings from these models can be attributed to aspects of information asymmetry and the market using information other than that provided by the balance sheet for valuation purposes, these findings also raise questions about the use of these models. It seems highly likely that the outcomes can be affected by the proportionate contribution made by the various capitalised assets used as predictors and unless some background work is done to investigate this, it is not immediately apparent. Such an investigation would be an interesting extension to the study, but in the meantime the findings generate a caution over interpretation in this type of modelling. Whilst interesting reasons can be used to explain the findings, the outcomes need to be looked at in the light of general background information about the specific data used.

## ***Chapter Nine – Concluding Remarks***

### **9.1 – Introduction**

This final chapter provides a summary of the purpose of the study and the findings, examines the contribution the research makes to literature, and acknowledges the limitations of the research, providing suggestions for future research.

### **9.2 – Summary of the Study and Main Conclusions**

#### **9.2.1 – Objectives of the Study**

Following extensive research on intangible assets in countries outside New Zealand, this study seeks to provide some insight into intangible asset capitalisation by NZSE-listed companies.

Using information on intangible asset capitalisation, extracted from financial reports in the 2000 year for 134 NZSE-listed companies, the objectives of the study are to determine various aspects of capitalisation such as the type of intangible assets capitalised by these companies, the diversity of this capitalisation over company size and industry sector, the value of capitalisation to the companies and whether or not that value is capitalised at cost. In addition amortisation practices are noted. The relationship between capitalisation and the level of corporate debt is examined, on the basis that debt level may influence capitalisation or amortisation practices. Finally, the value relevance of capitalised intangibles is investigated along with factors that might influence this value relevance, particularly because of possible information asymmetry concerns.

### 9.2.2 - Conclusions

In the 2000 year just over 60 percent of New Zealand companies in the study capitalise intangible assets, covering a wide diversity of industry type and size. As with Australian companies, there appears to be a diversity of intangible assets capitalised, but apart from goodwill, brands and licences, followed by trademarks, are the most common. As with Australian companies, only a small proportion of New Zealand companies capitalise development costs.

Although goodwill is the dominant intangible asset capitalised, being capitalised by 84 percent of capitalising companies, in terms of value, the dominance is through intangibles other than goodwill, which represent 57 percent of total capitalised intangible value.

Goodwill tends to be capitalised by larger companies more than smaller companies, which is expected because it occurs through corporate acquisition, but smaller companies tend to capitalise intangibles other than goodwill and in doing so tend to be less conservative in their approach to intangible capitalisation.

Despite the concerns raised in the feedback to ED-87 (Russell-Green, 2000), the NZSE-listed companies in the study tend to be erring on the conservative side of intangible asset capitalisation, with only 12 companies in the study capitalising assets at value rather than cost. (Although a few of these companies may have internally generated assets, this is not determined the current study.)

However, when it comes to amortisation, there appears to be less likelihood of following the guidelines in ED-87, with companies tending to opt for longer periods of amortisation or, in the case of intangibles other than goodwill, sometimes opting for no amortisation.

The majority of companies do not appear to be motivated by higher debt levels when it comes to capitalising intangible assets. Although capitalising companies have greater levels of debt than non-capitalising companies, the findings show that companies with higher levels of debt tend to have a lower contribution from

capitalised assets to total asset value. These companies also tend to capitalise only goodwill. However, debt level may be a consideration when choosing amortisation practices, opting to retain asset value on the balance sheet when debt is higher.

In concordance with the findings for companies in other countries discussed in the studies reviewed in Chapter Three, capitalised intangible assets are value relevant for these NZSE-listed companies. However, despite this being the case, there is wide discrepancy generally between the book and market values of equity, more pronounced for capitalising than for non-capitalising companies. So whilst capitalisation certainly brings the book and market values closer, and therefore assists in the determination of market values, the differential between the two in many instances is still great, suggesting that other indicators (such as earnings forecasts) may have a greater impact on that determination.

Finally ownership diversity and company size are found to be influential in the value relevance of capitalised intangible assets, but the findings in this section of the study may well be influenced by other characteristics of the data, such as the proportionate contribution of the type of intangible asset to total asset value.

### **9.3 – Contribution to the Literature**

As stated earlier, it is hoped, with the paucity of literature on intangible asset capitalisation in New Zealand, that this research will contribute to filling this gap. As such it is seen as a springboard from which further research can develop.

The findings give an in-depth descriptive analysis of intangible asset capitalisation by NZSE-listed companies as well as investigating aspects of motivation (in relation to debt levels) and value relevance.

## 9.4 – Limitations of the Study

The study has some limitations and the findings are given in recognition of those.

It is cross-sectional in nature, taking information from a particular point in time – both from the financial reports of the companies in a particular financial year and the share price for the company at that year end. As such, there is a possibility that this information is not representative of the true picture of book and market value, and that information gathered at another time might produce quite different results.

In addition, from the perspective of overseas studies, the data base for this study is small, and as such the credibility of the outcomes might be questioned. However, the aim is to start somewhere and with the limitations through manual data collection, a single year's data is chosen (the latest available at the time research commenced). Hence the picture presented in this research relates only to those companies examined in the 2000 year, the limitations are recognised, and the conclusions are not attributed any wider than this.

Another limitation is in the lack of information about the companies eliminated from the research, through lack of availability both of annual reports (some companies had gone into liquidation and others simply would not provide an annual report), and share price information. Despite this, the remaining companies in the study included all the larger companies. Those companies eliminated because of share price information are all companies that do not capitalise intangible assets so it is doubtful that any significant information about intangible asset capitalisation has been missed through the elimination of companies for the above reasons.

A final limitation is that the study is confined to *capitalised* intangible assets. Hence there is no investigation into other types of disclosure, nor any estimate made of the uncapitalised intangible asset value in the companies examined. In addition the study covers only assets – intangible liabilities are not considered. These are areas that could all be covered in future research.

## **9.5 – Suggestions for Future Research**

Future research could involve firstly a longitudinal extension of this study to see what patterns of change emerge over time in relation to intangible asset capitalisation by companies in the New Zealand reporting environment. In addition a study of this nature would probably have a larger database, providing more information to work with and lending greater credibility to the findings.

An investigation into uncapitalised intangibles could also be of interest, determining what companies have in the way of intangible assets that are not capitalised. This leads to corporate valuation. This study seems to suggest that book value is unlikely to contribute significantly to estimation of market value so a study of the determinants of corporate value by investors in the New Zealand market could be of interest.

Finally, a study of regression modelling for value relevance would be interesting, to determine whether other considerations in the data used in these models are in fact influential on the outcomes of the modelling.

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## Appendix

**TABLE I: LEVELS OF MARKET VALUE FOR 73 FACTORED CAPITALISING COMPANIES**

Market Value	Factor											
	Ownership Diversity				Industry Capitalisation				Debt Level			
	Greater		Lesser		High		Low		High		Low	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
> \$100m	23	56	13	41	17	47	19	51	21	53	15	45
< \$100m	18	44	19	59	19	53	18	49	19	47	18	55
<b>Total</b>	<b>41</b>		<b>32</b>		<b>36</b>		<b>37</b>		<b>40</b>		<b>33</b>	

**TABLE II: MARKET-TO-BOOK EQUITY RATIOS FOR 73 FACTORED COMPANIES**

MV/BV	Ownership Diversity		Industry Capitalisation		Size		Debt Level	
	High	Low	High	Low	Large	Small	High	Low
> 2.5	11	4	7	8	12	3	10	5
2.0 – 2.5	2	1	1	2	2	1	1	2
1.5 – 2.0	9	6	7	8	9	6	8	7
1.0 – 1.5	8	7	6	9	6	9	7	8
0.5 – 1.0	8	10	11	7	7	11	11	7
< 0.5	3	4	4	3	0	7	3	4
<b>Total</b>	<b>41</b>	<b>32</b>	<b>36</b>	<b>37</b>	<b>36</b>	<b>37</b>	<b>40</b>	<b>33</b>