ACCOUNTING FOR THE ELEPHANT IN THE ROOM

DISCLOSURE OF INTANGIBLE ASSETS IN NEW ZEALAND PUBLIC COMPANIES

Annual reports of all entities should, in addition to all information required by law, include sufficient meaningful information to enable investors and stakeholders to be well informed on the affairs of the entity.
– New Zealand Securities Commission (2004, p. 21)

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There's an elephant in the room.
It is large and squatting, so it is hard to get around it.
Yet we squeeze by with, "How are you?" and "I'm fine," and a thousand other forms of trivial chatter. We talk about the weather. We talk about work.
We talk about everything else, except the elephant in the room.

- from *The Elephant In The Room,* by Terry Kettering[1]

[1] Retrieved on 20 October 2005 from http://www.bartow.k12.ga.us/psych/crisis/elephant.htm.

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In common with the acknowledgement Stewart (2002) made to his Apple PowerBook – his "terrific tool and durable friend" – mine (on wireless broadband internet) has been an astonishing window to the world and aid to productivity.

ABSTRACT

Company market values often exceed the values that are published in company annual reports. One popular explanation for this discrepancy is that traditional company accounting and reporting practices ignore the potentially very large value creating impact of intangible assets, which are also often referred to as intellectual capital or knowledge resources.

The theories for measuring intangible assets are reviewed, highlighting the many conceptual and definitional problems that have been encountered. These problems are traced to the resource-based static perspective of intangible assets, which sees them as balance sheet items analogous to tangible assets. A recent transition from this perspective is identified in the literature, towards recognising that the value of intangible assets arises more from their use than their possession. This is a dynamic or flow perspective of intangible assets, which views them as knowledge resources used strategically to create value. Adopting this perspective shifts the intangible asset issue away from being an accounting matter based on reporting historical transactions, to become a corporate governance and strategic management matter concerned with reporting future value creation performance and capability.

The empirical research develops and tests a novel instrument for measuring intangible asset reporting in New Zealand public companies, building on recently introduced Danish intellectual capital reporting guidelines centred on this emerging dynamic perspective. Of a sample of 50 listed public companies, 84% are found to be voluntarily reporting their use of intellectual capital to create value, 16% extensively. The reporting differences between these companies are then explored. Nearly two thirds of the variation may be explained by a combination of differences in profitability, the capital market's perceptions of their future added value, industry differences of tangible asset intensity, company size and company expansion strategies.

The empirical findings show a positive relationship between higher levels of disclosure and the future value placed on companies by the capital markets, which suggests capital markets

reward companies that adopt a more open disclosure policy with a lower cost of capital and easier access to capital.

These outcomes are compared with the inconclusive results found in a control survey of intellectual capital disclosure based on the earlier static perspective using a commonly used disclosure measurement methodology. This comparison reinforces the relevance of the emerging dynamic perspective of intangible assets, and the value to be gained from adapting disclosure research methodologies that reflect this approach.

This research shows there is currently a very low level of performance outlook reporting by New Zealand companies, a finding consistent with international research. It may seem that the next logical step from disclosing how a company intends to use intangible assets to create value is for its management to report its view of forward-looking expected performance. However, the literature reports that companies with conflicting goals may undermine the confidence the capital markets are prepared to place on their projections. Capital markets prefer to make their own informed assessments of the future performance of companies based on their own external assessment of each company's business model.

In the context of the principles-based reporting guidelines in New Zealand's corporate governance regulatory framework, the findings of this research indicate that a small group of exemplar companies are leading the way towards a more comprehensive voluntary disclosure of their future value creation strategies. This offers evidence that the principles-based regulatory approach is working to raise the average quality of annual report disclosures by New Zealand public companies, though the uniformity and instant results of a rules-based approach are missing.

DEFINITIONS AND ABBREVIATIONS

AGCCKC	Australian Government Coordinating Committee on Knowledge Capital
AICPA	American Institute of Chartered Public Accountants
ASX	Australian Stock Exchange
CICA	Canadian Institute of Chartered Accountants
CLERP9	Australian Corporate Law Economic Reform Programme Stage 9
DATI	Danish Agency for Trade and Industry
DCF	Discounted Cash Flow
DMSTI	Danish Ministry for Science, Technology and Innovation
EU	European Union
EVA	Economic Value Added
FSB	Federal Standards Board
GAAP	Generally Accepted Accounting Practice
GRI	Global Reporting Indicators
IAS 38	International Accounting Standard 38
IASB	International Accounting Standards Board
IC	Intellectual Capital
ICAEW	Institute of Chartered Accountants of England and Wales
ICAS	Institute of Chartered Accountants of Scotland
IFRS	International Financial Reporting Standards
IPO	Initial Public Offering
MC	Management Commentary
MD&A	Management Discussion and Analysis (also sometimes MDA)
NZ	New Zealand
NZSC	New Zealand Securities Commission
NZSX	New Zealand Stock Exchange
NZSX50	New Zealand Stock Exchange Top 50 companies index
OECD	Organisation of Economic Cooperation and Development
OFR	Operating and Financial Review
PDF	Portable Document Format
S&P500	Standards and Poor Top 500 companies index (US)
UK	United Kingdom
US	United States of America
VAIC	Value Added Intellectual Capital
XBRL	Extensible Business Reporting Language
Y2K	Year 2000 (usage here refers to computer software date adjustment issues)

Note: Company stock exchange code abbreviations used in the text are shown in Table 4.2.

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1.1 The Elephant in the Room

Effective corporate governance ensures that management processes add value to the investment made by shareholders (Cadbury, 2002). Management writers, since Drucker (1974), have increasingly regaled management practitioners about the power of ideas, innovation, knowledge and skills to achieve this purpose. For all that this obvious notion may today be in danger of becoming a platitude, disclosure studies have shown these powerful value creating intangible assets receive scant attention in most annual reports compared to their tangible counterparts.

To use the idiom *the elephant in the room*, intangible assets are the large and glaringly obvious aspect of business management that companies are reluctant to face up to when accounting for their affairs. Accountants and managers prefer to skirt around intangibles, because facing up to them is fraught with serious measurement, recognition, valuation and other accounting difficulties. Accounting standards are centred on recording historical transactions rather than measuring the capability of intangible assets to add future value. But intangible assets play a vital role in the management processes of adding value to tangible assets. Companies ignore them at their peril.

This thesis asserts that the intangibles *elephant* is too large to be ignored.

It confronts the intangibles *elephant*, with a review of the state of the art in measuring and disclosing intangible assets, and an empirical analysis of current practice in the disclosure of intangible assets in a sample of publicly listed New Zealand companies.

1.2 Research Objectives

The aim of this research is to contribute greater clarity to the corporate governance issues surrounding the disclosure of the intangible assets that are the vital drivers of a 21st Century company's value creation strategy and performance outlook. This study highlights the definitional and methodology difficulties that are challenging scholarship in this area.

A contemporary paradigm shift can be observed taking place in the literature, from viewing intangibles as static *intellectual capital* to be measured as an asset in an accounting balance sheet sense, to seeing them as dynamic *knowledge resources* with a powerful value creation role when used in business strategy. While financial statements are a lagged indicator of future performance, a dynamic perspective turns intangibles into a leading indicator of future value creation performance. This shift reinforces that intangibles are more of a management issue than an accounting issue; and that they are a central aspect of management's business strategy decision-making. This research explores this paradigm shift in depth.

A significant part early in this study is devoted to a review of the first of these two paradigms, which has dominated the literature on intangible assets until very recently. Although the intangible asset discourse has been carried out across traditional disciplinary barriers, the first well-entrenched paradigm carries the inference that accountants should be routinely measuring and comprehensively reporting the value of a company's intellectual capital. This research sets out to show there are compelling reasons why this is a mistaken viewpoint.

A related common fallacy is focussed on early in this research: that the gap between the market value and net tangible asset value of a company can be attributed only to its intangible assets. This gap has grown in most companies over the past two decades, coinciding with an increased use of computers and information; but it has also coincided with macroeconomic management changes, including tax and interest rate changes, that have also contributed to the observed changes in this gap over time.

Intangible assets in an accounting sense are narrowly defined by accounting standards. Although new approaches are being adopted with international accounting standards in New Zealand, the historical transaction basis for accounting as a stewardship function limits the scope for accounting to address the entirety of the intangible assets question. In a management sense, intangible assets are more broadly defined to include human, structural and relationship capital, capabilities and competencies. These various meanings are explored and clarified.

A transition to adopt the second of the two paradigms is evident in recent literature, and it shows greater promise. This paradigm views intangible assets as inert, or of little or no market value, until managers realise their value in use. It follows that they are a future value creation issue. As such, they are less an historical transaction accounting matter than a forward-looking corporate governance and strategic management matter. This research highlights the greater relevance to business practitioners of the emerging dynamic definition of intangible assets compared to the earlier static definition. It looks particularly at how the newer paradigm is bridging the gap between the previously separate scholarship streams addressing intangible assets and corporate strategy.

Building on this second paradigm, a fresh empirical approach to disclosure measurement methodology is developed in this research, drawing on intellectual capital reporting guidelines that were developed in Denmark. These guidelines emerged from a predominantly European discourse on the subject, especially within the Scandinavian countries, through the 1990s.

Approaching the disclosure of intangibles from a value creation perspective has the potential to bring new insights. This emerging perspective also holds out an opportunity to refine the intangible assets disclosure measurement methods that have been used in prior studies of company annual reports. In doing so an important aim is to obtain more meaningful quantified measurements that enable more useful inter-company, inter-temporal and international comparisons than has been possible from the measurement methods used in earlier disclosure studies. Prior annual report disclosure studies using a content analysis

methodology based on a static perspective have found low levels of disclosure in several countries. By adopting the forward-looking value creation perspective of intangible assets, this study will re-evaluate the level of disclosure in a sample of leading listed New Zealand companies. The research will investigate the potential for causal relationships and disclosure motivations to be more successfully explored empirically when there is access to improved quantitative data on company disclosure practices.

A related exploration will be made into contemporary practices for disclosing the expected outcome of a company's value creation strategy, its forward-looking performance outlook. Those companies that make few disclosures about either their performance outlook or their value creation processes present their future prospects to the capital markets as a "black box". This raises an interesting question: does a board that presents its value creation strategy and performance outlook to the capital markets as a "black box" comply with current corporate governance principles? Compliance aside, are these boards missing out on an opportunity to add future value to their company in the eyes of the capital markets?

Under the principles-based corporate governance regulation in New Zealand, the boundaries between mandatory and voluntary disclosure become blurred, and an interpretation challenge for boards and regulators. This study will explore intangible asset disclosure practices under the principles-based approach to the guidelines for corporate governance that is employed in New Zealand. It will investigate the effectiveness of this regulatory approach in stimulating meaningful voluntary disclosure from an intangible assets perspective.

The present international corporate governance agenda of business ethics, corporate governance effectiveness, auditing performance, international accounting standards and sustainability reporting is very full; but this study asks whether the next big corporate governance issue will be the quality of the forward-looking performance and value creation strategy disclosure made by companies. There is a balance to be found between persuading the capital markets to increase the future value placed on a company, and the defensive issues

of securing the company's negotiating position with employees and suppliers, and protecting its competitive advantages.

1.3 Outline

The literature review in Chapter Two seeks to clarify the intangible assets debate. It demonstrates that there have been material misconceptions centred on viewing intangible assets from the static or resource-based perspective, to be accounted for like tangible assets. Because this has been the dominant view in the literature until recently, the background and issues are discussed at length to justify the conclusion that the conceptual and definitional problems inherent in this viewpoint appear to be insurmountable given the inherent nature of intangible assets. A paradigm shift is shown to be evident within recent literature, as a way forward to address this problem.

Chapter Two moves on to explain the emerging replacement paradigm, which adopts a dynamic or flow perspective that sees the value in intangible assets arising when they are used in value creation. This paradigm is especially powerful within companies using knowledge resources in the information economy, and is more of a strategic management than an accounting issue. These are forward looking issues, both financial and non-financial, that are not traditionally addressed with historical transactions in financial accounts.

In Chapter Three the literature review turns to the intangibles disclosure debate. The theoretical basis for disclosure is explored, and the stakeholder audience for intangible asset disclosure is discussed. Regulatory aspects are briefly reviewed. This Chapter goes on to review empirical research into intangibles disclosure, and the methodological issues that are linked to the evolving conceptual issues discussed in Chapter Two.

Chapter Three also reviews the forward-looking performance outlook disclosure question, the expected outcome of value creation strategies, and the information that stakeholders are really seeking from disclosure, either directly or indirectly.

The empirical research questions, methodology and data collection are clarified in Chapter Four. The empirical approach takes the emerging dynamic value creation perspective of intangible assets, and seeks to identify an effective and quantitative disclosure measurement methodology that can be used in analysis gain insights into the use of intangible assets in practice by New Zealand public companies.

Chapter Five reports on the analysis and discussion of the empirical research, in five main areas:

- Static intellectual capital disclosure: a control experiment using an established methodology,
- Dynamic knowledge resources disclosure: a trial of a new methodology that reflects the evolving intangible assets paradigm,
- Patterns of disclosure,
- Motivations for intangibles disclosures, and
- Value creation outlook disclosures.

This is followed by an overall discussion of the findings. Finally, Chapter Six reviews the conclusions and why their implications are relevant; and identifies a potentially productive agenda to further this direction of research.

2 Value Creation In The "New Economy"

2.1 Literature Review: Intangible Assets

This Chapter traces the development of intangible assets as a construct in the literature, in the context of business value creation. This construct has evolved through several paradigms, and remains difficult to define with precision and consensus. In part this is because the idea of intangible assets overlaps the boundaries of several disciplines, none of which have clearly asserted ownership and resolved many of the outstanding issues.

Until recently intangible assets appeared to be an accounting measurement issue: a balance sheet item to be valued. As the review in this Chapter argues, there are fundamental conceptual difficulties with this overly simplistic placement. Because this resource-based perception of intangible assets has dominated the literature until very recently, these difficulties are addressed at length to show why there has been a paradigm shift to a new dynamic perception. Under this emerging perception, current thinking is that intangible assets are not an accounting issue, but a corporate governance and management issue. They play a central role in business value creation strategy, especially in the knowledge-based "New Economy". The measurement question is no longer about a company's stock of intangible assets – which will be shown below to be a concept of doubtful usefulness – but instead focuses on the contribution of intangible assets to the creation of future value. As such, the intangible assets issue is certain to be of increasing significance to any business using knowledge resources.

There is no doubt that value creation through intangible assets is a vital issue, but by its nature it remains a difficult and elusive concept. For those in business who can effectively combine and manage intangible assets to create value, the rewards can be huge. Accordingly, this Chapter will show there is growing evidence in recent literature of a convergence between business strategy and intangible asset issues.

2.2 Creating Value With Intangible Assets

Intangible assets - also often referred to as intellectual capital or knowledge capital in the context of corporate value creation – are a primary driver of growth in business value in the information age. The growing role of intangible assets in business is summarised by Benston, Bromwich, Liton & Wagenhofer (2003) as follows:

> *... much of the value the market assigns to many companies is intangible and cannot be found on their balance sheets (or income statements) — largely because intangible assets often cannot be bought and sold in the marketplace independent of the company itself. Intangible assets include not only intellectual property such as patents, copyrights, trademarks, and trade secrets, but also the value of a company's work force, its customer base, its name brand and recognition, advertising, and all other intangibles that contribute to its ability to generate earnings. Intangibles are important not only for so-called high-tech companies, but also for many "old economy" enterprises that may have unique production processes, valuable brand names, superior reputations for quality and service, highly trained work forces, and stable customer bases.* (p. 81)

For example, the ANZ Bank Limited Annual Report for 2004 (p. 23) claims the value of the company's stock of intangible assets has been growing at 20% per year compounding in recent years, and has reached 60% of the company's market value per share. ANZ includes in their definition such intangible assets as a unique strategy, a strong brand, sustainable leadership, talented people, growth opportunities, and a vibrant culture.

Intangible assets have also become an important focus for academic researchers over the past decade. Reviews by Kaufmann & Schneider (2004) and Petty & Guthrie (2000), in the specialised *Journal of Intellectual Capital,* revealed there is now a substantial body of academic research literature on the subject.

Bodies such as the United States of America Securities and Exchange Commission (SEC), the OECD (OECD, 2004b), the European Union (Meritum, 2002; Eustace, 2003) and the World Bank have been active in promoting the intellectual capital debate. A World Congress on Intellectual Capital has been held regularly at McMaster University in Canada (Bontis, 2002, reported on the 4th Congress, held in 2001), and numerous other seminars and conferences on intellectual capital and knowledge management now regularly take place around the world.

For all the progress that has been made towards understanding and managing intangible assets, there is still an inconclusive and ongoing debate. Three distinct phases of progress have been identified. Petty & Guthrie (2000, p. 162) described a first stage of interest mainly in the mid-1990s "concerned with consciousness raising and creating mass awareness of the relevance of intellectual capital" – which they characterised as the "what, why and where" issues. This was followed from the later 1990s by a second stage of in-depth investigation into, as they put it, the "how" issues. Roos, Pike & Fernström (2004) summed up their review of the state of the art of valuing and reporting intangibles four years later by proposing a third stage:

> *The need remains to take another step from the current position in which management and measurement models have progressed to what is commonly called third generation intellectual capital.* (p. 21)

They see the focus for this further stage on developing a "practical tool" for a "truly comprehensive intellectual capital management and measurement scheme." (p. 21)

Roos (interviewed in Chatzkel, 2002, p. 112) described the three stages from a different perspective. In his view the first stage was a scorecard measurement approach to identify intangible assets, while the second stage addressed the identification of intangible assets as value drivers. The cutting edge third stage for Roos is about attaining an overall measure of value creation as perceived by the benefiting stakeholders, who in this case he sees as mainly the customers and shareholders.

Kaufmann & Schneider (2004) also concluded from their review of current research into intangibles that much remains to be done:

> *Our analysis has shown that few examples of empirical work exist, and that the literature also generally lacks a theoretical framework that could be used and tested.* (p. 385)

Until recently[2] intangible assets have only been recognised in generally accepted accounting practices if they arose through a purchase of intellectual property or a business as a going concern (i.e., goodwill), and these recognised intangible assets were required to be amortised over time. Internally generated intangible assets could not be recognised, and nor could intangible assets hold or increase their value in reported accounts. There has been much criticism of the accounting profession for not formally recognising, measuring and reporting intangible assets as dominant value creating corporate assets within financial accounting standards. This review will show that much of this criticism has been misplaced. Some of the debate over the need to measure and report on intangible assets has been based on an overstatement of their impact on share market values through the 1990s. Misconceptions have also been held about the mutable nature of intangible assets, and about the validity of mixing forward-looking prospective valuations with historical cost transactions in financial accounts. Instead of the earlier research focus on bringing intangible assets into financial accounts, this review will suggest that the promising direction for future research into intangible assets lies in two areas, namely their contributions to:

- management's strategy development, and
- forward-looking performance disclosures and reporting.

[2] US Generally Accepted Accounting Practices (GAAP) permitted the impairment valuation or purchased intangible assets in place of depreciation from 2001, and IFRS standards presently being adopted in New Zealand follow suit in NZ International Accounting Standard (IAS) 38.

2.3 Background Setting

The economic value of intangible assets, representing ideas, innovation and knowledge, has long been recognised. The popular mid-19th Century (1812-1904) motivational author, Smiles (1948), gave numerous examples through the ages of individual business success built on innovative ideas and expertise in the use of knowledge, the latter often gained from persistent personal experimentation and hardship before the rewards can be reaped. The late 19th Century (1842-1924) economist Alfred Marshall (1947), referring to the economic value of education, stated that:

> *... the economic value of one great industrial genius is sufficient to cover the expenses of the education of a whole town; for one new idea, such as Bessemer's chief invention, adds as much to England's productive power as the labour of a hundred thousand men.* (p. 216)

This early emphasis on the role of an individual's knowledge has developed, with the eventual emergence of the concept of the company, to focus on a company's collective knowledge and how it can use this resource (Mouritsen & Larsen, 2005). The legal system has long recognised that intangible assets have an economic value, which is to be seen expressed in the law addressing intellectual property rights through copyrights, patents and trademarks.

At a practical business level, the early Twentieth Century work of Taylor in codifying and replicating work skills and expertise is an example of how business value could be created through capturing and using knowledge (Drucker, 1989, p. 182-183). The role of intangible assets in creating value in business was nevertheless overshadowed by the dominant industrial age business role of generating returns on investment in tangible assets, as has been reflected in the traditional management and accounting systems used in business.

Early economists approached the role of a firm from a resource-based production function perspective similar to that underlying the contemporary concept of intangible assets as a

source of value creation in the modern firm. Joan Robinson described "the four factors of production: Land, Labour, Capital and Enterprise" as a "traditional demarcation of factors" in 1933 (p. 19). The role of enterprise in the success of capitalism was recognised by Schumpeter (1943), who pointed to the important economic role of innovation achieved through combinations of knowledge. This idea was further developed by Penrose (1959) who recognised the role of organisations as repositories of knowledge. Prescott & Visscher (1980) considered the macroeconomic significance of intangible assets. Solow (1957) and Arrow (1962) contributed the concepts of technical change and learning to the theory of production functions, which Senge (1990) later developed into the influential concept of a learning organisation.

Several management thought leaders recognised that early stages of economic changes would increase the significance of these issues. For example, Drucker (1969, 1974, 1989) referred to the growing role of "knowledge workers". Galbraith (1967) discussed the relative growth of "white collar" as against "blue collar" jobs (p. 268). Sveiby (2001) referred to correspondence by Galbraith that used the term "intellectual capital" in 1969. Handy (1989) also developed the theme of the growing significance of working with information.

Hubert Saint-Onge developed the idea that a company's relationship with its customers was an intangible asset, and introduced the term "customer capital" in the early 1990s (Chatzkel, 2000, 2003). In a similar vein, economist Becker (2005), who won the Nobel Prize for Economic Sciences in 1992, worked mainly in the area of "human capital".

Human resource accounting was briefly discussed then faded from view during the 1970s, and was in some ways a precursor to the intangible asset debate. Grojer & Johanson (1998) contributed a paper linking human resource accounting to the then emerging debate about accounting for intellectual capital, which acted as a bridge between the two schools of thought. The positivist basis that the human resource accounting movement espoused, and attempted to carry through to the early intellectual capital movement, struggled with conceptual difficulties in its aim to record intangible asset values as monetary balance sheet

items. While the normative desirability of placing all intangibles on a financial balance sheet had an appealing rhetoric, the valuation challenge has proved insurmountable in the face of the incompatibilities between accounting based on historical transaction costs and the value-in-use approaches adopted for intangibles (Roslender & Fincham, 2001).

The intellectual capital movement has moved on to use operational measures where financial measures are not appropriate (Marr & Chatzkel, 2004).

Although the accounting difficulties of recognising and reporting intangible assets in historical financial statements have been intractable, investors and analysts have long recognised their significance when estimating future earnings, as noted by Weston & Brigham (1966):

> *Despite the reluctant recognition of intangible assets in accounting, the effects of intangible assets were often recognised derivatively, as part of a security's "intrinsic value", in the present value procedure used by financial analysts for estimating business valuations by means of capitalising the future income that is expected to be generated by an enterprise.* (p. 277)

2.4 Recent Emergence of Interest

The emergence of strong interest in intangible assets over the past decade can be traced to two important developments: an evolution beyond the industrial economy to an information economy, and the expanding gap between company stock market valuations and the value of tangible assets shown on company balance sheets.

First, the transition from the industrial economy to the information economy began from about the 1960s (Toffler, 1980) and heightened awareness of the growing importance of the roles of ideas, innovation and knowledge in corporate success, as distinct from their long recognised roles in individual success. This transition steadily gathered strength, greatly boosted by the proliferation and increasing power of information and communications

technology. Petty & Guthrie (2000, p. 157) summarised the nature of these changes as follows:

- *the revolution in information technology and the information society;*
- *the rising importance of knowledge and the knowledge-based economy;*
- *the changing patterns of interpersonal activities and the network society; and*
- *the emergence of innovation as the principal determinant of competitiveness.*

Sullivan (2000, p. 238) gave credit to Itarni, a Japanese researcher, for the first published work on the role of "invisible assets" in the management of companies in 1980. Stewart (2002, p. xv) attributed the first development of the taxonomy of intellectual capital to work in Sweden by Sveiby (1997) in the late 1980s. Stewart (1991) gave intellectual capital its first business media exposure in an article in *Fortune* magazine (1997). Lieff Edvinsson then paved the way for applying the concept of intellectual capital as an explicit strategy to add value to a company at the Swedish multi-national company Skandia, and initiated the first intellectual capital statement as an adjunct to the company's formal annual report in 1993 (Edvinsson & Malone, 1997). Nonaka & Takeuchi (1995) were among the first writers to discuss in detail the processes for knowledge creation within companies. Brooking (1996) envisaged a growing role for intellectual capital in what she termed the future "Third Millennium Company."

Looking for the origins of the second key development, Stewart (2002, p. xiv) found a 1958 report on a group of companies, including information technology pioneer Hewlett-Packard, with unusually high market valuations of their stock. The financial analysts authoring the report used the term "intellectual capital" to explain the high price to net assets per share ratio. Edvinsson & Malone (1997) and Stewart (1997) developed this idea further to develop a definition of intellectual capital with the formula:

Intellectual Capital = Market Value – Book Value

For clarity, the term "book value" as used by the authors in this formula refers to net tangible assets (i.e., assets less liabilities) not to the book value of assets (i.e., historical cost of assets less accumulated depreciation). It follows that a less ambiguous expression of the formula could be expressed in this manner:

Intellectual Capital = Market Value – Net Tangible Assets

According to Edvinsson & Malone (1997), their use of this formula has its origins in Tobin's "q", which, in fact, is a technically different calculation. When correctly expressed it is the ratio of the market value of a company's securities over the replacement value of its assets. Tobin's "q" was originally used as an indicator of returns in excess of the cost of capital to support strategic capital investment decisions (Brainard & Tobin, 1968; Tobin, 1969; Lindenburg & Ross, 1981).

As the gap between market valuations and net tangible assets expanded through the 1990s, there was a widespread perception that accounting was at fault, a phenomena summarised by Edvinsson (2002) as follows:

> *The deficiencies in the accounting system explain a lot of the discrepancies we see occurring with stock market valuations.* (p. 73)

Other intellectual capital authors applied the Edvinsson & Malone (1997) formula to show that intangible assets had assumed much greater importance in the market value of shares during the last two decades of the twentieth century. For example, Brewer (2004) attributed the fall in the book-value-to-market-value ratio for the average American company, from 95% in 1978 to 28% in 1998, to the rising significance of intangible assets. Similarly, Ballow, Thomas & Roos (2004) attributed the massive structural shift in market valuations of S&P 500 shares in the United States of America from the early 1980s to intangible assets, as shown in Table 2.1.

Table 2.1: US S&P 500 Tangible Versus Intangible Assets

Year	*Tangible Assets*	*Intangible Assets*
1982	62%	38%
1992	38%	62%
1999	16%	84%

Source: Ballow, Thomas & Roos (2004)

Ballow, Thomas & Roos (2004) concluded there were $US7.6 trillion – "58 percent of the aggregate value of the United States of America share market" – in corporate assets that "go under-recognized and under-reported" in the United States of America in May 2003, even after the 1999-2000 internet bubble. At the height of the internet bubble examples abounded of companies with relatively few tangible assets achieving extremely high relative market valuations – justified on the market's perception of the future value of their intellectual capital as defined by this formula. For example, in 2000 AOL, with tangible assets of US$7.6B, was able to use its vastly greater market value of US$197.2B to buy Time Warner (Stewart, Yang & Nica, 2005, p. 36). Their combined market capitalisation in January 2000 was US$288B, but fell to US$74B after the internet boom in mid-2003 (Sudarsanam, Sorwar & Marr, 2004).

From an economic analysis perspective, when researching capital accumulation in the American corporate sector, Hall (2001) observed that:

> *The data suggest that U.S. corporations own substantial amounts of intangible capital not recorded in the sector's books or anywhere in government statistics.* (p. 1186)

Hall concluded that much of that intangible capital had been formed during the 1990s decade, and saw intangible capital "as an important part of a modern economy".

These two key developments marked, for many, the start of a "New Economy" with a different business model that needed new measures of value creation (Daum, 2001; Callahan & Garrison, 2003). At the heart of the perceived difference was the new role of intangible

assets or intellectual capital in the market valuations attributed to companies in the information economy.

2.5 Irrational Exuberance?

The role of intangible asset values in the rise in the market value of shares in most western countries through the 1980s - 1990s came into question after the internet bubble burst in 2000, especially the share prices for the knowledge-intensive internet related stocks listed on the American share market. Asked for his comments on risks associated with the high value of the "q" ratio shortly before the internet bubble burst, Tobin (1999) pointed to other influences on the rising market values for American shares:

> *I am agnostic. Many people do conclude from the record high value of Q [sic] that the market value of equity is bound to fall. They may be right, though they haven't been yet. There are other logical possibilities. Maybe there has been a fundamental reduction in the cost of equity capital, the risk premium on stocks relative to bonds and federal funds. Then the high value of Q [sic]is a signal and incentive for real productive business capital investment; gradually the increase in stock of corporate capital at replacement cost will reduce the marginal productivity of capital and reduce Q [sic], but no bubble and no crash. Another problem is that increasingly the capital value of companies is not tangible assets but human capital, more precisely the ability of the management to find and hold the brightest innovators. It's like betting on the coach of a sports team. That kind of asset is not in the denominator of Q [sic] as we calculate it.*

One school of thought was that the volatility and bubble in values was attributable to difficulties being experienced by shareholders in valuing intellectual capital. It followed that academic research should focus on how to better disclose intellectual capital to provide adequate and more balanced information for stakeholders (Lev & Daum, 2004).

United States of America Federal Reserve Chairman Greenspan is credited with the first use of the term "irrational exuberance" in 1996 (Shiller, 2000) to describe the inflated value of the "q" ratio that resulting from the buying behaviour of investors during the development of the bubble. In his books that followed and expanded on this explanation, Shiller (2000; 2005) like Hormats (2004), drew parallels between this behaviour and a primitive "herd behaviour" in which higher individual risk and self-sacrifice is accepted in a group activity (e.g., hunting or war) to achieve that is something generally perceived to be for the good of the greater community.

At the height of the boom, Bond & Cummins (2000) used economic modelling to cast doubt on the role of intangible assets in the rising market valuations. Prescott, the 2004 winner of the Nobel Prize in Economics Sciences, went further and developed macroeconomic models of the United States of America and United Kingdom economies for the 1980s-1990s period. McGrattan & Prescott (2005) concluded that neither intangibles nor irrational exuberance could explain the steady rise of share values during the 1980s and 1990s. Their findings showed that the real explanation lay in economic, taxation and regulatory changes, and, although different changes and different share market growth patterns applied, that this conclusion was valid for both the United States of America and the United Kingdom share markets. In this study, tax reductions were observed to have taken place early in the start of the upward cycle in both the United States of America and United Kingdom. One significant example of the taxation and regulatory changes cited was the introduction of tax concessions for retirement savings instruments in the United States of America:

> *In particular, we find that the large decline in the effective marginal tax rate on U.S. corporate distributions accounts for the high value of equities in the late 1990's relative to the 1960's. There are two reasons for the big decline in this tax rate. First, there were reductions in marginal income tax rates, with the largest changes beginning in the early 1980's. Second, and more importantly, there were changes in the legal and regulatory system that led to a dramatic increase in the share of*

> *corporate equity held by entities that pay no tax on dividend or capital gains income. The percentage of corporate equity held by these entities—namely, pension funds, individual retirement accounts, and non-profit organizations—increased from 4% in 1960 to 51% in 2000.* (p. 768)

The effect of such changes was to reduce the expected rate of return by investors, which, after an adjustment period, became capitalised in increasing share prices. They also applied their macroeconomic model to the 1970s, and found that macroeconomic settings also successfully explained the decline in American share market values that took place through that earlier period.

McGrattan & Prescott (2005 p. 92) dismissed as "residually determined" the conclusion reached by Hall (2001) that the rising difference between market value and tangible assets was attributable to growing intangible assets. In their economic modelling they were looking for specific causal relationships, and saw no theoretical basis for attributing the explanation for the residual just to the role of intangible assets in value creation.

Further evidence undermining the perception that intangible assets was the driver of rising share market prices came from Callahan & Garrison (2003), who traced the political and Federal Reserve steps in managing the United States of America economy and its economic relationships globally through the same period. They highlighted the role of interest rate and liquidity changes as the main drivers of rising share market values through the 1980s and 1990s, and the long adjustment cycles that are observed as funds take time to move from one form to another. In another analysis, Koller, Goedhart & Wessels (2005) pointed to three main reasons for the American bull market through the 1980s and 1990s: the decline in American interest rates from 15% in 1981 to 5.7% in 1999; a decline in inflation; and, a sustained growth in company earnings. These indicators also reflect the underlying economic management steps that took place through this period.

These economic studies suggest the strength of the second main driver for the recent interest in intangible assets – the growing gap between market values and net tangible asset values –

has been overstated in the intangible asset literature. They show that other powerful influences were also at work in addition to the apparent growing influence of intangible assets as a creator of corporate value.

McGrattan & Prescott (2005) did not specifically address the causes of the American share market's 1999-2000 internet bubble peak in their analysis, and found their macroeconomic model did not explain share market volatility as well as it explained long term economic trends. Koller, Goedhart & Wessels (2005) attribute the peak of the bubble to the prices of a small number of large company stocks (e.g., Cisco and GE), and the technology, media and telecommunications sectors' stocks, becoming excessively over-valued. To emphasise the sectoral nature of the bubble they pointed out that 40% of S&P 500 companies increased in value in the bear market that followed the internet bubble, and that the median S&P 500 company's value only fell by 8%. Callahan & Garrison (2003) attributed this to the overheating of the American economy in the lead up to the presidential elections, extra liquidity injected into the economy in anticipation of a Y2K crisis, a rise in interest rates when this crisis did not materialise, and a behavioural effect they described as "IPO mania." They pointed to a parallel boom in Silicon Valley real estate, rising internet company labour costs and a boom in internet domain name prices. Their evidence corroborated the sectoral nature of the "irrational exuberance" explanation. Bontis & Mill (2004) likened investment in internet companies during the bubble to casino gambling, and analysed the nature of the "web metrics" (e.g., clicks per month) used as a proxy for company valuation in place of the abandoned fundamental financial analysis methods during the boom.

The New Zealand share market did not experience a similar boom and bust at the turn of this century. This is explainable in part by the absence of any material internet company sector in New Zealand, but also because New Zealand's economic management policies followed a different path from those of the United States of America and the United Kingdom.

On a smaller scale than major events like the internet bubble, share market fluctuations are continually taking place in response to information and behavioural effects, or "noise".

While, as in the example given in the introduction of the ANZ Bank, companies do still value their intangible assets on the basis of the formula put forward by Edvinsson & Malone (1997), this formula does not take account of the exogenous economic and behavioural variables that are also at work in determining the market valuation of shares. The extended period of growth in share values culminating in the internet bubble has shown that measuring intellectual capital as a residual, without a correction for exogenous variables, cannot be relied upon to value the endogenous efforts of company managers to build their company's intangible assets. The economic studies also show that the influence of these exogenous variables can be material and persistent over long periods.

The risk of distortion is particularly present in longitudinal studies of market value trends, across economic management jurisdictions and without price smoothing to correct for short term trading noise. A further modification to the formula is implied:

Intellectual Capital = (Market Value – E) – Net Tangible Assets

where:

E represents exogenous effects including economic management variables, changes in investor return expectations and behavioural market fluctuations, and

Net Tangible Assets are valued at their going concern market value.

However, there are still further difficulties with the construction of the formula that also need to be addressed.

2.6 Further Valuation Traps

Andriessen (2004a, pp. 341-343) pointed out several logical problems with the formula proposed by Edvinsson & Malone (1997) for deriving the value of intellectual capital as a residual. First, if a company's intangible assets are to be valued by the market using the formula, then so too should its tangible assets. When the market value reflects a company's intrinsic value it will represent a consensus estimate of the discounted present value of expected future earnings. In practice tangible assets are commonly valued in accounts at

depreciated historical costs rather than at a valuation that reflects their future earnings capability in use as a going concern. To the extent the book values of tangible assets understate their going concern market values, the residual formula will overstate the going concern value of intangible assets. The formula alone includes insufficient information to overcome this problem, and present accounting practices do not offer an obvious solution. Secondly, the components of the formula are not always independent (M'Pherson & Pyke, 2001), such as when net tangible assets include retained earnings generated in part by intangible assets. Thirdly, different accounting practices can change the values used, making longitudinal, inter-company and inter-jurisdiction comparisons difficult. Fourthly, Andriessen (2004) argued that market value includes the net present value of the expected growth opportunities available to the company as well as the earning capability of its present assets. Achieving the future growth expectations implied by the market value may first require new investment, either in tangible or intangible assets, or in both. The residual formula may, therefore, overstate the present intangible assets controlled by a company for which the market has growth expectations.

A fifth concern is that investments in intangible assets, such as research and development, staff training, marketing and advertising, intellectual property right protection, etc. have traditionally been expensed, and thereby understate earnings. These are the earnings investors are likely to rely upon when they make projections to arrive at a market value. Recent accounting standard changes (i.e., IAS 38) permit a few of these expenses to be capitalised under special circumstances, but most of the problem remains.

The main impact of these issues are addressed with the following further modifications to the formula:

$$\textit{Intellectual Capital} = \textit{Market Value} - E - G + I - \textit{Net Tangible Assets}$$

where:

E represents exogenous effects, including economic management variables, changes in investor return expectations and behavioural market fluctuations,

G is the growth value calculated as the net present value of future investments and their earnings included in the Market Value,

I is an intangible investment adjustment, to correct for an understatement of earnings due to most investment in intangible assets being expensed under current accounting principles, and

Net Tangible Assets are valued at their going concern market value.

An analyst is faced with escalating practical measurement problems for the growing number of variables in this refined formula for measuring intellectual capital, but there is yet another and more fundamental problem inherent in the formula. Roslender (2004, p. 39) observed that measuring an organisation's stock of intellectual capital using this formula would be "largely irrelevant, a purely artificial exercise". This is because the formula adds little of interest to capital markets. It starts with the market value already determined by the capital markets, and then attempts to retrospectively fill out the detailed components of this valuation. This exercise may offer clarification and verification to the market's assessment, but offers little new information over that already possessed by the capital markets. Accordingly, it is doubtful there are sufficient benefits to justify tackling the difficult adjustments required before an analyst could make the formula work effectively. Nevertheless, the raw formula is still used, as seen recently in Ballow, Thomas & Roos (2004) and the ANZ Bank's 2004 Annual Report.

2.7 Knowledge to Value: A Resurgence of Alchemy?

Adding value to the tangible assets invested in a company through applying ideas, knowledge and other intangible assets has long been a fundamental function of management. There is a consensus that they are vital to business success, and increasingly so in the information economy (Kaplan & Norton, 2004b, Ch. 1). As information, communications and knowledge management technologies have advanced over the last two decades, and become increasingly accessible and affordable, the capability of enterprises to realise the value of intellectual

capital has rapidly escalated. Keeping perspective is important. Contrary to a persistent view in the intellectual capital literature that intellectual capital is primarily responsible for rising share prices (e.g., as recently as Burgman & Roos, 2005), the research by McGrattan & Prescott (2005) attributes most of the rising United States of America share value through the 1980s and 1990s to exogenous economic management variables, especially those that reduced the cost of equity. Reviewing the findings of other economic studies as well, McGrattan & Prescott (2005) also estimated that the proportionate value of intangible capital in the United States of America corporate sector has not greatly changed between the 1960s and 1990s:

> *The fact that our estimates of intangible capital in Table 2 are of similar magnitude in the 1960's and 1990's is also consistent with evidence on directly measured intangibles. According to surveys of the National Science Foundation (1953–2002), the amount of R&D performed by the industrial sector was as large in the 1960's as in the 1990's, roughly 1·9% of GDP. According to data of the media agency Universal McCann (1929–2000), advertising expenditures as a percentage of GDP averaged 2·1% in the 1960's and 2·2% in the 1990's.* (p. 782)

Some would argue that each generation sees business activity in developed economies transformed by new skills, knowledge and relationships and that the information economy is just the latest manifestation of this pattern (ICAEW, 2003, p.13). Marr & Spender (2004) suggested that the recent transition to an information economy was no more socially tumultuous than the emergence of the industrial economy in the 19th Century. However, they did observe that the changes were of a different nature, and that the role of information in the present transformation was increasing the relative importance of intangible assets compared to physical and financial assets.

Even if some of the claims of dramatic growth and change may be overstated, intangible assets are undoubtedly a very important component of contemporary business investment. Lev & Daum (2004) reported a study by Nokamura that estimated "the annual US investment

in intangible assets was roughly [US]$1 trillion, almost equal to the total investment of the manufacturing sector in physical assets ([US]$1.2 trillion)" (p. 6).

Accepting the large impact of economic management decisions on the generally rising share market values through the 1980s and 1990s, it is apparent that intangible assets are also having a strong impact on the share prices of knowledge intensive companies. As technology has increased the capability to create, collect, store, access, analyse and use information, the anecdotal evidence of the growing strategic importance of information is strong. This trend will increase the significance of intangible assets in the average company's valuations. With the sale in New Zealand of Trademe, primarily an internet auction company, for $700M in March 2006, there can now be little doubt that the value of intangible assets will become greatly more significant for those companies that take the opportunity to place them at the centre their value creation strategy.

Powerful early exemplars of the newly emerging role of intangible assets in building corporate value were Coca Cola and Microsoft, both huge global enterprises. Coca Cola divested most of its physical assets (mainly its bottling and distribution assets) in 1986, and concentrated its business on its brand building and marketing (Mizik & Jacobson, 2005). Its market value was initially little more than its remaining net tangible asset value, but by 1998 its market value was 34 times as great. When software developer Microsoft was first listed on the share market in 1986 its market value exceeded its net tangible assets by 24, but by 1998 the ratio had reached 74 (Bond & Cummins 2000, pp. 66-67). The ratio for Microsoft, in particular, showed fluctuations around 1990; and the internet bubble affected the market values of both companies. Setting aside the difficulties placing a stable value on their intangible assets – their brands, know how, business models, strategies, relationships, software, and so on – these two companies demonstrate that large and profitable companies can be built from intangible assets, with relatively few tangible assets compared to traditional industrial economy companies. They show that intangible assets can create value on a vast

scale: the two wealthiest people in the world have large shareholdings in these two companies, Bill Gates in Microsoft and Warren Buffett in Coca Cola (Forbes, 2005).

The rapid growth of huge internet and technology companies such as Google, eBay, Dell and Apple, several years after the hype of the internet bubble period, show the powerful value creating potential of intangible assets when the business model exhibits low marginal costs while marginal yields remain high. In place of the diminishing returns to scale associated with industries based on large investments in physical assets, these newer industries based on intangible assets can show increasing returns to scale. An investment in marketing can show a very high return because marginal costs are very low (e.g., for software). Bringing into play the leverage of a supply and distribution network of partners earning a commission still yields a high contribution margin, and the increased sales volume multiplies returns still further. Applying these characteristics of the intangibles business model with information and communications technology on a global scale can result in dominant global market leadership, as exemplified by Microsoft (Daum, 2001).

That there is a "New Economy," one centred on creating value through intangible assets, is an observable phenomenon; but it is now a less universal and dramatic change than was the commonly held perception during the internet boom, and an opportunity only some companies have exploited. Predictions by some commentators at the height of the internet boom that the "Old Economy" would be rendered obsolete have not been realised.

2.8 *Characteristics of Intangibles*

While intangible assets are of undoubted significance, the goal to define them, and to put a direct and verifiable value of on them, is elusive. This is because intangible assets have unique characteristics that make them very different from tangible assets:

- Unlike tangible assets, most intangible assets can be re-used time and again without depreciating in value – in fact greater use can increase their value through learning and experience. They are readily shared and multiplied, such

as when a new best-practice solution is spread through an organisation. They are more likely to show increasing returns to scale (even exponential growth such as that experienced by Microsoft) rather than the decreasing returns to scale that characterise tangible assets (Roos, Pike & Fernström, 2004).

- Small investments in intangible assets can generate a very high return, while large investments can contribute little or no value; and this may be the case for investment in the same asset, as when one software project fails and another is very successful.
- Intangibles can quickly lose their value, such as when an idea is displaced by a better one through invention or competition, which makes an enterprise dependent on intangible assets more vulnerable to exogenous change. Not all negative effects on intangible asset values need be exogenous. For example, an endogenously initiated redundancy programme may be detrimental to the morale and work performance of remaining employees, thereby reducing the future earnings potential of a company.
- Intangible assets can be internally generated and often gain value in combination, through teamwork, through combining human talent with information resources, through management systems and even the right work environment (Kelley, 2002).
- Intangible assets used to create value need not necessarily be owned and controlled, such as when expertise is purchased, or in the case of relationships with customers or suppliers (Edvinsson & Malone, 1997; Burgman & Roos, 2005).
- Tacit knowledge, while vital, can be very complex, and difficult to recognise and explain so that it becomes explicit knowledge (Nonaka & Takeuchi, 1995). Collins & Porras (1994) and Collins (2001) made similar observations about

the intangible nature of the basis for a company's long-term survival and success.

- Intangible assets can be interrelated and interdependent, and have synergistic value within a particular context, which means they are not necessarily additive in value as is normal for tangible assets (Roos, Pike & Fernström, 2004). By themselves, individual intangible assets can be commodities available to all companies (e.g., the services of specialist consultants). Their value increases when they are combined in the company's value creation processes to create a competitive advantage that commands a premium market value over their cost. In other words, their value-in-use exceeds their value-in-exchange (Benston, Bromwich, Liton, & Wagenhofer, 2003, p. 83). Therefore a holistic view must be taken of the value creation system of a company (Lev & Daum, 2004), recognising that there is an infinite possible mix of resources used in the business models developed by different companies to create value (Chatzkel, 2002).
- Intangible assets (excluding the special case of intellectual property rights) are not readily marketable, other than as a bundle within a business sold as a going concern, where they contribute to the goodwill premium over the value of tangible assets. This means that individual intangible assets are rarely seen as adequate security by lending institutions. They may, however, lend against the security of the proven performance in use of the bundle of intangible assets of a going concern.
- Intangibles only have potential until they are actually employed to create value, and they usually need to be combined with other production factors. Their value arises when they are used, not when they are merely in stock (Lev & Daum, 2004). It is their transformational flow that creates value: as stock

their value remains inert until their potential is realised through use (Roos & Roos, 1997).

- Some intangible assets (e.g., staff training) can take time to become of value (Meer-Kooistra & Zijlstra, 2001), which suggests such assets are more of an investment than an expense, and adds further support to the observation that the value of intangibles is realised in their use rather than their accumulation as stock.

Agreement on a definition, taxonomy and measurement methodology for intangible assets has, to date, proved to be intractable in the face of these characteristics. Nevertheless, a variety of approaches have been adopted in an attempt to address these difficulties.

2.9 Definition

Intangible assets are often described with catch phrases, such as "hidden assets" (Edvinsson & Malone, 1997) "invisible assets" (Sveiby, 1997), "unseen wealth" (Blair & Wallman, 2001) or "weightless wealth" (Andriesson, 2004), but there is not a consensus on a systematic definition (Kaufmann & Schneider, 2004; Marr & Chatzkel, 2004).

A definition centred on the Edvinsson & Malone (1997) formula has been popular. For example, the Danish government's earlier 2001 guidelines for intellectual capital disclosure statements (DATI, 2001), takes this approach:

> *The market value of the company (i.e. market capitalisation) minus the book value. In conjunction with intellectual capital statements, the intellectual capital is often constituted by the grand total of customers, organization and individual capital. It is also named knowledge capital.* (p. 103)

Others who have taken a similar approach to defining intellectual capital include Stewart (1997) and Ordonez de Pablos (2004). For the reasons already discussed, this residual approach to the definition of intellectual capital is too simplistic to be useful, and, as

Roslender (2004) points out, does not add much of value to what capital markets already know.

Edvinsson & Malone (1997) also remarked that:

> *Intangible assets are those that have no physical existence but are still of value to the company.* (p. 22)

This broad definition could perhaps extend to financial assets, such as funds in bank accounts or shares, although that was no doubt not the intent. Lev (2001) addressed the need for financial assets to be excluded, and added a forward-looking aspect in their definition:

> *An intangible asset is a claim to future benefit that does not have a physical or financial (a stock or a bond) embodiment.* (p. 5)

In place of this negative or residual approach, based on what intangible assets are not, a definition by Stewart (2002) set out the components of the value in intangible assets positively:

> *... a company's intellectual capital is the sum of its human capital (talent), structural capital (intellectual property, methodologies, software, documents, and other knowledge artefacts), and customer capital (client relationships).* (p. 13)

The risk in this approach is that some aspects of intangible assets may be excluded. For example, in this case supplier relationships are not mentioned, but other researchers (e.g., Sveiby, 1997, p. 9) do include them.

Petty & Guthrie (2000) favourably cited an OECD definition of intellectual capital, which included organisational and human but not relationship capital, and went on to argue that a firm's reputation was not part of its intellectual capital. This instance exemplifies the intricacies that can be involved in arriving at a consensus definition based on components.

Stewart (1991; 1997) brought out the idea that the value creating advantage of intellectual capital was the way its various components gain in value when combined within an

organisation structure, which he referred to as "collective brainpower". Edvinsson & Malone (1997) put forward yet another definitional perspective by suggesting some intellectual capital could be regarded as a debt rather than an asset, such as skills borrowed by a company from its employees, or relationships borrowed from its suppliers and customers. This perspective reflects the dependence of a company on other parties for ongoing access to the value in at least part of its intellectual capital. Roos & Roos (1997) distinguished between the stock of intellectual capital and the flow of knowledge. The Danish intellectual statement guidelines reflect this distinction, being less concerned with how much stock of intellectual capital a company may possess or control – the static perspective – and more with how it is using its available intellectual capital to achieve a defined purpose or use – the dynamic perspective.

Combining the concepts in the various definitions suggests the pragmatic conclusion that intangible assets are a corporate asset, formed by combining the separate individual ideas and knowledge of a company's human resource and its relationships, internal and external, with an organisational structure that is able to capture and turn this resource into a greater combined asset that is in combination capable of driving future growth in corporate value.

The notion of an intangible asset is a mutable concept in the literature. Intangible assets, or intellectual capital, are so imprecisely defined in the literature that an adequate definition may be simply *the residual factors of production that create value for an organisation after excluding physical and financial assets*. This broad definition suggests there has really not been much progress in this area beyond the broad catch-all nature of the fourth factor of production, *Enterprise*, which was identified by Joan Robinson in 1933 to complement the other three factors, *Land*, *Labour* and *Capital*.

Defining intangibles as a business resource is a challenge. There are a near infinite variety of innovative ways an imaginative business can create value. Attempting to reduce them all to a standard formula is an attractive goal (Kirby, 2005) but it may defy their very nature. Nevertheless, attempts to develop the taxonomy of intellectual capital have proceeded, in spite of the definitional challenges.

2.10 Taxonomy

The lack of a consensus on the definition of intangible assets is also reflected in the variety of taxonomies that have been developed to explain the concept. Sveiby's model of a company's intellectual capital asset included three categories: the competencies of its people, its internal structure and its external structure (Stewart, 2001, p. xv). This model has remained largely intact, but the terms and component details now widely used have developed further.

In their recent book, Kaplan & Norton (2004b) adopted intangible assets into their balanced scorecard model using three categories: human capital, information capital and organisation capital. Marr & Adams (2004), while welcoming the addition of intangible assets to their model, were critical of this approach on the grounds it was at variance with a general convergence in other literature on another three categories that have emerged from Sveiby's original model: human capital, organisational (or structural) capital, and relation capital. This convergence is reflected in the adoption of these categories in the guidelines for managing and reporting on intangibles that has been generally agreed in Europe through broadly based research participation in studies such as Meritum (2002).

The human capital category includes such elements as:

- competence, attitude and intellectual agility (Roos, Roos, Dragonetti & Edvinsson, 1997),
- education and experience (Sveiby, 1997),
- skills and tacit knowledge: know how and competencies (Andriesson, 2004),
- know-how, education, vocational qualification, work related knowledge, work related competencies, entrepreneurial spirit, innovativeness, proactive and reactive abilities, changeability (Petty & Guthrie, 2000), and
- knowledge, competence, intellectual agility, relationship ability and attitude (Roos, Pike & Fernström, 2004).

The elements of organisational or structural capital include:

- the part of intellectual capital that doesn't "go home at night" (Edvinsson & Malone, 1997),
- innovation and process capital (Edvinsson & Malone, 1997),
- organisation, management, legal structure, manual systems, attitudes, research and development, software (Sveiby, 1997),
- relationships, organisation, renewal and development (Roos, Roos, Dragonetti & Edvinsson,1997),
- physical infrastructure, virtual infrastructure, culture, routines and practices, intellectual property (Marr & Schiuma, 2003),
- collective values and norms, processes (e.g., leadership and control, communication, management information), technology and explicit knowledge (e.g., patents, manuals, procedures) (Andriesson, 2004),
- patents, copyrights, trademarks, management philosophy, corporate culture, management processes, information systems, networking systems, financial relations (Petty & Guthrie, 2000), and
- structures, systems, and processes, brands, image, culture, prototypes, documented information, intellectual property (Roos, Pike & Fernström, 2004).
- management philosophy, corporate culture, management processes, and information technology systems (Brooking, 1996).

Relation capital elements include:

- brands, customer and supplier relationships (Sveiby, 1997),
- customers, suppliers, network partners, investors (Roos & Roos, 1997),
- stakeholder resources (Marr & Schiuma, 2003),

- installed base of customers, brand and image, network of suppliers, network of talent (Andriesson, 2003),
- brands, customers, customer loyalty, company names, distribution channels, business collaborations, licensing agreements, favourable contracts, franchise agreements (Petty & Guthrie, 2000),
- customers, suppliers, media, strategic partners and other alliances structures, systems, and processes, brands, image, culture, prototypes, documented information, intellectual property (Roos, Pike & Fernström, 2004), and
- networking systems and financial relations (Brooking, 1996).

These elements are a representative but not complete list of the many identified in the literature. In essence, human capital is knowledge and talent, structural capital is the ability to use it and relation capital is the ability to realise its value (Stewart, 1997).

While Ordonez de Pablo (2004) proposed detailed components of intellectual capital that might form a standard listing for the formation of a structured intellectual capital stock report, Gallego & Rodriguez (2005) make the point that:

> *We must assume that new forms of intangible assets will emerge in the future; that our universe of classification is subject to constant change, and that we are facing an issue that remains to be fully elucidated.* (p. 107)

A further challenge faced by an attempt to produce the definitive taxonomy of intangible assets is, as already noted, that intangible assets create value in combination with each other and the other resources and processes of an enterprise, not just individually. Therefore, they should be evaluated as a holistic value creation system (Lev & Daum, 2004), resembling the "collective brainpower" concept put forward by Stewart (1991; 1997). It follows that attempts to separately evaluate the partial value contribution of components of a company's intellectual capital are misguided. Instead Lev & Daum (2004) advocated a focus on applying the economic concept of total factor productivity. The synergy that can come from the various

intangible assets working together resembles the concept of the gestalt in psychology, where the organised whole is perceived to be greater than the sum of its parts.

The literature on the taxonomy of intangible assets is helpful at a pragmatic level to understand where intangible assets may be found in business, but it would be a mistake to try to limit the value creation inventiveness of business within the bounds of a rigid taxonomy.

2.11 PRISM Report's Taxonomy

The European Union sponsored PRISM Report (Eustace, 2003) approached the taxonomy of intangible assets in a very different way. Complementing the tangible physical and financial assets of a firm, it suggested three intangible asset categories:

- *Intangible goods*: e.g., contractual assets (such as licences, quotas and franchises), intellectual property rights (patents, copyright, trade marks) and other similar intangibles with a marketable value such as brands.
- *Intangible competencies*: e.g., distinctive (i.e., hard to replicate), core and routine competencies.
- *Latent capabilities*: e.g., leadership, workforce calibre, organisation and networks, market positioning and reputation, innovation and corporate renewal.

The report proposed a focus on making progress with methods for managing and valuing the first category, *intangible goods*; but also highlighted the need for improved performance measurement and management, at both the macroeconomic and microeconomic levels, to take better account of intangible assets.

This taxonomy usefully distinguishes intangible assets that can have an individual monetary value from those that are competencies and capabilities (resembling those identified by Hamel & Prahalad, 1994), which enable and enhance holistic value creation, but which are much less conducive to a meaningful separate individual valuation.

2.12 Terminology

Adding to the imprecise nature of the discourse on defining intangible assets, the terminology is also loosely used in the literature on intellectual assets (Kaufmann & Schneider, 2004). The most common terms found are "intangibles", "intangible capital", "intangible assets", "intellectual capital", "intellectual assets", "knowledge capital" and "knowledge assets". While Edvinsson & Malone (1997) suggested that borrowed intangibles can also be seen as a debt, the notion that intangibles are an "asset" or "capital" is still persistent in the literature. Knowledge management, a similar concept that has emerged from information technology disciplines, can be distinguished as the process or act of managing the intellectual capital asset (Petty & Guthrie, 2000, p. 159).

The term "intellectual property" is rarely used to refer to intangible assets. It is usually confined to use in the context of legal rights to copyright, patents or trademarks. In this sense, intellectual property is just one category of intangible assets, albeit a more specifically defined category that is sufficiently "tangible", in the sense of having an objectively measurable cost and market value, to be admissible as an accounting balance sheet item.

Brooking (1996, p. 179) distinguished intellectual capital from intangibles and goodwill to differentiate the concept from traditional accounting approaches. Intangibles and goodwill arise in traditional accounts when companies or assets such as patents are purchased, and in most countries accounting practices have required them to be amortised. With the term intellectual capital, Brooking sought to highlight the value of internally generated intangible assets, and the fact that they could expand in value over time in contrast to the traditional accounting perception that their value would always depreciate.

Burgman & Roos (2005, p. 9) also emphasised Brooking's distinction to separate the issues of the accounting recognition of intangible assets from the processes of managing intellectual capital assets. They developed this distinction further, by suggesting intellectual capital assets could be both intangible (e.g., customer loyalty, leadership capabilities) and tangible (e.g.,

patents, formalised customer or management contracts and alliances). This further enhancement to their approach makes for an attractive looking matrix asset classification system, but drawing the refined distinctions between asset classes would appear to present serious practical judgement difficulties.

In a world becoming wary of management fads, the use of the older term "intangible assets", now carrying fewer implications of traditional accounting practices, may be re-emerging in popular usage. In doing so, it appears to be replacing the more pretentious term "intellectual capital" (Roslender & Fincham, 2004, p. 189). This trend is evident in usage in two recent review papers by researchers specialising in the area (Roos, Pike & Fernström, 2004; Kaufmann & Schneider, 2004), and in most accounting (e.g., ICAEW, 2003) and economic (e.g., McGrattan & Prescott, 2005) literature.

Another less common approach in emerging practice is to use the term "knowledge capital" in place of "intellectual capital" (Chatzkel, 2003). A recent example of this usage is the Australian Government's Consultative Committee on Knowledge Capital (AGCCKC), which is currently addressing the possibility of intellectual capital reporting guidelines being developed in Australia (AGCCKC, 2005).

The balance sheet connotations of the description of intangibles as assets or capital implies a long lived asset, and the static notion that such an asset can be accumulated as a stock. The Roos & Roos (1997) dynamic perspective of intangibles sees them more as a resource or capability to be used to create value, a concept more analogous to the accounting concepts of an expense or a trading inventory than to capital goods. In this context, referring to intangible, intellectual or knowledge "resources" may be more meaningful than the more common use of the terms "assets" or "capital". This usage is occasionally to be found in recent literature (e.g., Gray, Roos & Rastas, 2004).

An international consensus on the terminology associated with intangible assets and intellectual capital has not yet been reached. While Sveiby (2005) credits Stewart (1991) with the common usage of the term "intellectual capital" through the 1990s, recent literature is not

consistent in the choice of terminology used. The lack of definitions and consistency in the terminology used in the intangibles discourse remains potentially confusing. A reader is expected to find meaning within each context.

In this thesis, in common with Sveiby (2005), the terms are used interchangeably, reflecting the context in each case, such as the usage in the literature sources being cited. A preference for using the term "intangible assets" is adopted here as a generic term in general discussion. In the empirical work "intellectual capital" is adopted to denote a static context and "knowledge resources" to denote a dynamic context.

2.13 Dynamic Versus Static Intangibles

The holistic role of intangible assets combining in the value creation process with physical and financial assets can take place in an infinite variety of ways. It is a dynamic process, concerned with the flow of intangible assets rather than just the level of the stock of intangible assets that a company may have at its disposal (Roos & Roos, 1997). There is a growing consensus in the literature that the static stock of intellectual capital may inform as to the potential value creation capability of a company, but that the more meaningful measure of management performance is how intangible assets are put to strategic use in value creation (Burgman & Roos, 2005; Lev & Daum, 2004). The difference between intellectual capital as a stock and as a flow can be expressed as a formula, in a similar manner to distinguish between capital and investment in tangible assets:

$$ICF_t = ICC_t - ICC_{t-1}$$

where:

ICF_t is the flow of, or investment in, intellectual capital in period t, and

ICC_t is the stock of intellectual capital at the end of period t and ICC_{t-1} is the stock at the end of period $t-1$.

While this formula is helpful at a conceptual level, applying it to calculate the flow of intellectual capital assets is not as straight forward as is the case of tangible assets. Mouritsen

(2003) described how entangled resources exist in action, as a "recipe" that performs collectively to create value. In this way entangled resources including intangibles gain a value-in-use greater than the disentangled value measured at historical cost or at a market value – the idea from psychology of the gestalt. Together, entangled resources become core competencies (Hamel & Prahalad, 1994) which may be tacit (Nonaka & Takeuchi, 1995), in that they are difficult to recognise and understand let alone measure, verify and disclose in any other sense than their value creation capability as exhibited by their output performance.

Further, a problem with treating all intangible assets as capital is that not all such assets necessarily have a life beyond the current accounting period. Intangible assets can also display the characteristics of an expense or trading stock rather than an investment. For example, within the microcosm of a single project for a customer that takes just a few months, there can be customer relationship building, hiring and/or training for specialised skills, a targeted research and development effort, knowledge building and sharing, organisation and team building, and so forth. But once the project is completed there may be little or no asset left over to carry forward to the following reporting year.

The flow of value creation characteristic of intangibles renders a definition of intangible assets in a dynamic sense difficult, and very different from the static balance sheet perspective taken when accounting for physical and financial assets. Roos believes the static stock issue comes down to answering one main question about resources: "Do I have the necessary and sufficient amount?" (interviewed in Chatzkel, 2002, p. 109). For management, the intangible assets stock issue is about ensuring this question can be answered in the affirmative and that any excess is minimised as an excess cost. There may be a trade off between different categories of intellectual capital stock, such as higher skills and flexible processes in customised work and lower skills and more developed repetitive processes in production lines. Thereafter, Roos proposes, the management issues are all about deploying intangible assets dynamically to create value.

In a discussion about management tools to serve this purpose, Marr, Schiuma & Neely (2004) acknowledged the contribution of strategy mapping (Kaplan & Norton, 2004b) as an approach to portray the direct causal relationships between resources and value creation, but proposed a more comprehensive value creation mapping methodology. Their mapping methodology also includes indirect causal relationships to more comprehensively reflect the dynamic and interactive way that intangible assets combine to create value.

2.14 Measuring Intangible Assets

2.14.1 Different Approaches

The adage "what gets measured gets managed" has driven much of the effort to measure intangible assets (Roslender, 2004). The methods that have been proposed for measuring intangible assets fall into two main groups: those that attempt to place a dollar value on the assets and those that adopt a non-financial score card approach.

Two further distinctions have emerged in the literature. The earlier intellectual capital debate beginning in the 1990s took an endogenous viewpoint: how does a company measure, manage and report its intellectual capital from within? Recent literature has begun to define value from an exogenous viewpoint: how does an external stakeholder perceive the value created by a company?

2.14.2 Seeking A Dollar Value

The weaknesses of the early aggregate dollar value measurement approach to intellectual capital, the market value less net tangible assets formula, have already been identified. A further noteworthy weakness of this market-derived approach is that it has no means for measuring a non-profit organisation's intangible assets. The alternative return on asset method (Lev, 2001) avoided the disadvantages of the market value approach by basing its calculation on earnings. The excess return earned over a "normal" return on net tangible assets is attributed to intangible assets as a basis for arriving at an estimate of their value (Stewart,

1997; Lev, 2001). A variation is to adjust the earnings to base the calculation on the economic profit or added value, and another to adjust the earnings for expensed intangibles.

A value added intellectual coefficient (VAIC) has been proposed (Pulic, 2000; 2004). This attempts to measure intellectual capital by category from information in accounting reports, but makes several arbitrary assumptions when calculating the coefficient. Andriesson (2004) evaluated the method and found it "is based in assumptions that can be seriously questioned" and "produces dissatisfying results". Although it has been used in a number of studies with limited and mixed results (e.g., Williams 2001; Firer & Williams, 2003), this method holds out little promise for objective intangible asset measurement in the future.

Direct measures of the value of intangible assets have been attempted. Several are proprietary systems for which limited detail is publicly available. Leading examples are the *Technology Broker* (Brooking, 1996) and the *KPMG Value Explorer/Weightless Wealth Toolkit* (Andriessen, 2004a). Andriessen (2004b) described the experience and challenges of trying to develop and implement the *Value Explorer* method, which is no longer promoted by KPMG. Partial approaches to measuring the dollar value of intangibles include earlier human resource accounting approaches and methods to value intellectual property (Mouritsen & Koleva, 2005) and brands. These are incomplete approaches used for specific purposes.

Methods to put a monetary value on an intangible asset struggle with the problem that the value generated by combined intangible assets can be greater than the sum of their individual values, and with the concept of intangible assets as a dynamic value creating flow of resources rather than a static balance sheet capital item. None of the monetary measurement methods has been successful in gaining general acceptance. The standards set in IAS 38 admit the monetary valuation of a narrow range of individual intangible assets, under tightly prescribed circumstances, and mark the generally accepted boundary that has been reached.

2.15 New Reporting Model Proposals

Voluntary disclosures, and the relevance of intangible asset disclosures, have been debated for

some years. The evolution of reporting standards has been more cautious and conservative than the discourse.

Disclosure decisions generate tensions that reflect the different and sometimes conflicting goals of the several interested parties. Far from the:

> ... *elegant models of the workings of the capital market in a frictionless world ...* [today's] ... *market operates in a world where information is costly and unevenly distributed, agents are self-interested, transaction costs are pervasive, and noise traders are common.*(Gilson & Kraakman, 2003, p. 45)

Managers and accountants preparing reports prefer to report past transactions on an historical cost basis for which there is a relatively objective and documented source (Roslender, 2004); and they are reluctant to reveal information that may be useful to competitors (Dye, 2001), or to commit themselves to predictions in the face of an uncertain future (Field, Lowry & Shu, 2005). Auditors, too, prefer reports they can readily verify (Simunic, 1996). But present and prospective investors, in both equity and debt instruments, want information with greater relevance and interpretation to use to appraise past performance and project future performance (Garten, 2001). Standards setters and regulators want consistency and economic meaning and substance (Donaldson, 2004). Other stakeholders want non-financial information. They include suppliers and partners assessing creditworthiness and future prospects, employees looking for opportunities and job security, and communities and activist groups wanting assurances about socially responsible behaviour and reducing environmental impacts (Elkington, 1999). Consultants and advisors seek increased business opportunities from an expanded role to play in helping to prepare and/or audit enhanced company reports (e.g., DiPiazza & Eccles, 2002).

Numerous proposals have been put forward for radically different reporting models for companies. In the United Kingdom, *The Corporate Report* (ICAEW, 1975) laid a foundation for other later proposals and suggested reporting templates. *Making Corporate Reports Valuable* (ICAS, 1988), *The 21st Century Annual Report* (Carey & Sancto, 1998), *Business*

Reporting in the Digital Age (ICAEW, 1998), *Business Reporting: The Inevitable Change* (ICAS, 1999), *Tomorrow's Company* (Royal Society of Arts, 1995), *Sooner, Sharper, Simpler: A Lean Vision of an Inclusive Annual Report* (Centre for Tomorrow's Company, 1998), *Inside Out: Reporting on Shareholder Value* (ICAEW, 1999) and the *Hermes Report* (Hermes, 2002) are leading examples of other reports that followed in the United Kingdom.

The Jenkins Report (AICPA, 1994) in the United States of America made one of the more comprehensive proposals for incorporating non-financial performance measures and forward looking outlook disclosure in annual reports. Another comprehensive review of the role of intangible assets was reported by the Brookings Institution's *Unseen Wealth* report (Blair & Wallman, 2000). The United States of America Federal Accounting Standards Board (FASB) reported on *Business and Financial Reporting* (FASB, 2001). The Garten Report, *Strengthening Financial Markets* was also presented in 2001 (Garten, 2001). The Canadian Institute of Chartered Accountants (CICA) produced the *Strategic Performance Monitoring and Management: Using Non-Financial Measures to Improve Corporate Governance* report (summarised in Waterhouse, 1999).

An Enhanced Business Reporting initiative by the American Institute of Certified Public Accountants (AICPA) is currently active. Two submissions exemplify the topics of discussion. Accenture (2004) proposed a method for reporting non-financial intangible assets; and Vasarhelyi & Alles (2004) proposed options for using information technology to offer, among other options, more frequent reporting that can be readily customised to meet the needs of a range of stakeholders through electronic means. Further to the second of these proposals, a movement is well advanced towards standardising a data tagging solution, XBRL (Willis, 2003), to assist financial report users to access the customised information they want from companies.

European initiatives include the Danish intellectual capital statement guidelines (DATI, 2001; DMSTI, 2003a) and the European Union (EU) sponsored Meritum (2000) and PRISM (Eustace, 2003) studies of intellectual capital.

The *Triple Bottom Line* reporting model (Elkington, 1999; SustainAbility, 2004) and *Global Reporting Initiative Guidelines* (GRI, 2002; White, 2002) have emphasised sustainability reporting.

Even after these and other reviews around the world, the Institute of Chartered Accountants in England & Wales (ICAEW), in their recent review of reporting concepts (ICAEW, 2003), noted:

> *There has been growing concern in recent years that corporate reporting is inadequate. Exactly why it is thought to be inadequate varies from one commentator to another; some say that it has failed to adapt to the changing nature of business, some that it no longer meets the changing needs of investors, others that it fails to recognise a wide enough circle of users. .... The need for some degree of more or less fundamental reform – for whatever reason – seems to be widely accepted, yet there has been no agreement on how corporate reporting should be reformed, and there is no sign of such agreement emerging.* (p. 6)

Some assurance that the New Zealand Securities Commission (NZSC) has chosen to move cautiously into these debates comes in the review done a year after the February 2004 release. It found that 40% of the 2004 annual reports it reviewed had some shortcomings (NZSC, 2005), but concerns expressed mainly involved explicit compliance issues, rather than voluntary disclosure. The NZSC has shown no public indication of interest so far in radically new reporting models. The pragmatic reality is that the international emphasis is for now mainly on corporate governance, accounting standards and ethical compliance issues (Donaldson, 2005; Waal, 2005a).

But how soon will the earlier debates re-emerge, especially the persistent proposals for increased disclosure of non-financial performance measures, intangibles and their value creation role, and the quality of forward-looking outlook statements? A possible vehicle for re-opening this debate may be the forthcoming IFRS for management commentary (Texeira, 2004; Deloittes, 2005).

2.15.1 Accounting and Corporate Governance Standards

The adoption of IFRS in New Zealand has led to a small step towards accounting for intangible assets within financial accounts. NZ IAS 38 allows controlled, identifiable and separable intangible assets (i.e., ones that could be sold, transferred or licensed by the entity) to be recorded in financial accounts if it probable they will generate future economic benefits. They are brought into the accounts at historical cost, and depreciated over their useful life. Revaluation is possible if there is an active market. Purchased intangibles generally meet these criteria (e.g., goodwill, patents). For internally generated intangibles, the guidance in NZ IAS 38 is that research expenditure must be expensed while development expenditure that will probably generate future economic benefits may be capitalised. Internally generated goodwill, brands, mastheads, publishing titles, customer lists and similar intangibles may not be capitalised. The new standard will allow more intangible assets to be disclosed in financial accounts, but in a very restricted manner that does not fully address the concerns that have been expressed about the disclosure of the vital role of intangible assets in value creation (for a recent collection of such views by leading commentators in this field see Chatzkel, 2003).

As IFRS are being adopted widely outside the United States of America, accounting standards around the world are moving towards two main standards: US GAAP and IFRS. Since 2002 the convergence of these two standards has been under discussion (Holzmann & Robinson, 2004) but final convergence will be some years away, if it will ever be attained. This is because there is a fundamental difference in the orientation of these two standards: the US GAAP are rules-based while the IFRS are principles-based. The difference lies in the scope that rules are open to manipulation or financial engineering, as against the perceived litigation risks (especially in the litigious United States of America) over the interpretation of how accounting principles are applied. Although there has been an expressed intention for the United States of America to adopt a principles-based approach (Glassman, 2003), the arguments each way have not yet been fully resolved. Benston, Bromwich, Liton & Wagenhofer (2003, pp. 61-65) suggest it may be better left that way to encourage

international competition and innovation in accounting standards, rather than aim to lock all jurisdictions into one rigid set of standards.

American research has shown that a greater level of disclosure of progressive earnings forecast adjustments through the financial year does not increase litigation risk (Field, Lowry & Shu, 2005). This suggests that concerns about litigation over disclosure questions in the United States of America should not be over-emphasised when there is sufficient transparency.

However, there are other reasons for the strong emphasis on the rules-based approach in the United States of America. The nature of the ethical and compliance issues that have characterised much of the corporate governance debate in the United States of America recently suggests that the abuse of trust problems identified in agency theory are more present in the United States of America than in New Zealand. The rise of the knowledge economy saw the United States of America internet share market boom in the late 1990s, followed its collapse in 2000. This event raised searching questions about corporate reporting and disclosure, valuations, executive compensation and business ethics. Soon after, there were highly publicised corporate failure cases in the United States of America (Plumptre, 2004), involving such leading companies as Enron, Tyco, Adelphia, Global Crossing and World Com. The collapse of Enron then brought about the collapse of the accounting and auditing giant, Arthur Andersen. Monks & Minow (2003) noted that: "Seven of the 12 largest bankruptcies in American history were filed in 2002 alone." (p. 1) Other financial irregularity issues arose concerning KPMG, Xerox, AIG, Vivendi, and Gemstar. The US SEC took 679 enforcement actions in 2003 (Donaldson, 2004). Even the New York Stock Exchange became embroiled in controversy over possible abuses in executive compensation matters. In late 2005, news reports emerged of litigation being launched in the United States of America over US$32M of unauthorised payments to executives of media group Hollinger International. The detrimental effect of these corporate events on investors (especially through pension funds),

and on other stakeholders including employees, suppliers and communities, undermined public confidence in business, particularly in publicly listed companies.

These events led on to regulatory intervention (Donaldson, 2003, 2004). The US SEC initiated reforms in the United States of America investment advisory industry. The rules-based US Public Company Accounting Reform and Investor Protection (Sarbanes-Oxley) Act of 2002 was passed to strengthen corporate governance, reporting and auditing compliance requirements for American registered companies, some of which have interests in New Zealand. The Sarbanes-Oxley Act stressed the need for a stronger oversight of compliance and increased accountability, which reflects the findings that much of what went wrong in the major collapse of Enron was because existing US GAAP were ignored by managers (Benston, Bromwich, Liton & Wagenhofer, 2003, p. 33).

Inspired by events such as the HIH, Ansett Airlines and One Tel cases, legislation that is based more on regulation by rules than principles has also been enacted in Australia. The Australian Corporate Law Economic Reform Program stage 9 (Audit Reform and Corporate Disclosure) Act came into force in 2004. Among the numerous measures introduced with this Act, accounting standards gain legal backing, and the disclosure of operating and financial performance in annual reports is required to be sufficient to enable readers to ascertain the current financial position, strategy and future prospects of the company. These are more robust corporate governance requirements than is presently the case in New Zealand. This Australian move may set a future direction for future New Zealand legislation if past Trans-Tasman legal harmonisation trends continue and if the principles-based approach does not perform satisfactorily.

In view of the ethical difficulties that have arisen, basic normative financial accounting disclosure principles have again come to the fore: disclosures should be trustworthy (i.e., comply with agreed standards), reliable (i.e., are independently verified), relevant (to the reader's decisions) and enforced (by statutes, regulations or rules) (Benston, Bromwich, Liton & Wagenhofer, 2003, pp. 22-23). The renewal of emphasis on basic compliance principles is

not conducive to a broadening of the scope of disclosures to include more non-financial information. Especially in the United States of America, this return to a more strictly conservative approach is not readily compatible with the active European debate on additional non-financial disclosures in annual reports (DMSTI, 2003a; ICEAW, 2003). Meek & Roberts (1995) found that European companies were more likely to disclose non-financial performance information than American companies. Continental European companies were also found to disclose more strategy information than either United Kingdom or United States of America companies. These patterns may help to explain why intellectual capital has attracted little interest in the United States of America of late (Waal, 2005a) while it has in Europe (Eustace, 2003; Meritum, 2002).

Recent accounting standards revisions do not alter the fundamental nature of financial accounts: that they record historical transactions on a cost basis. Using this approach, accounting supports the vital stewardship function of corporate governance (Cadbury, 2002). Accounting has long been cautious about admitting to its processes the subjective judgements that are required to apply unrealised values to assets. There are many difficulties to be encountered when attempting to assign fair value or value-in-use measures to assets in financial accounts unless they are readily traded in a thick market. A fair value approach is seen as leaving too much scope for managers as self-motivated agents to manipulate financial statements to the possible detriment of shareholders (Benston, Bromwich, Liton & Wagenhofer, 2003). Accordingly, innovative initiatives to move far from the relatively verifiable historical cost basis of accounting are unlikely, especially in the present United States of America regulatory environment.

2.15.2 Accountants or Managers?

Traditional annual financial accounts are, then, a report on the past stewardship of the board and management, and this function is incompatible with the objective of reporting a viewpoint on the future value creation potential and expectations of a company. Lev & Daum (2004) considered that financial accounts:

> *...provide no information about the growth and adaptation potential of a company, nor do they disclose how efficient the company is in utilizing its bundle of resources, assets and capabilities to generate future revenue and income.* (p. 8)

Accounting does not look forward to measure future performance and nor does it reflect such projections in its asset valuations. The value-based measurement of intangible assets, is not a process that sits comfortably with traditional financial accounting (Roos, Pike & Fernström, 2004). Typically such a valuation would be based on the discounted present value a projection of future earnings, although a real options alternative for measuring intangible assets has also been considered (Sudarsanam, Sorwar & Marr, 2003). For objectivity, accountants have traditionally left such valuation assessments to the capital markets, or, in its absence, to independent valuation specialists who can rely on market benchmarks (e.g., for the property revaluations that are generally acceptable in accounting). It is this consideration that primarily marks the separation between the historical transaction reporting nature of accounting and the forward looking nature of the measurement and management of the value creation capability of intangible assets.

Critics of accounting do not always make this distinction, for example, when Stewart (2002) expressed his concerns as follows:

> *Most important, the case against conventional accounting has become – it seems to most observers – open and shut: It's incontrovertibly true that present financial and management accounting does not give investors, directors, the public, or management the information they need to make informed decisions. It is time, once and for all, to drive a stake through the heart of traditional accounting, which is draining the life from business.* (p. xiv)

The distinction was perhaps more fairly addressed, in a commentary on the emerging importance of intellectual capital, by Beaulieu, Williams & Wright (2001), who concluded that:

The traditional accounting model is not designed for this new economy, consequently, either the accounting model itself will need to change or companies will need to provide supplementary disclosures in their annual reports.

Roslender (2004) reviewed the difficulties faced by accountants if they are to modify existing financial statements to account for intellectual assets, and pointed out that accounting principles are in conflict with the measurement of intangible assets as creators of a company's future value. Assigning monetary values on an historical cost transaction basis to intellectual capital, then depreciating this value over the assets useful lifetime, is in conflict with both basic accounting principles and the mutable and gestalt nature of internally generated intellectual capital. It also mixes future value with historical costs. The very different characteristics of intangible assets have kept them apart from tangible physical and monetary assets, both in how they have been accounted for, and how they have been managed. The solution, Roslender (2004) suggested, lies in separate accounts for intellectual assets, which may use non-financial measures or narrative, include a combination of subjective forward looking projections and "critical self-appraisal of performance", and include other management functions as well as accountants in the reporting process.

Glassman (2003) expressed the concerns of the US SEC about US GAAP falling behind contemporary economic developments, difficulties determining business valuations from financial reports and the need to better identify risks and value drivers, among other concerns. But Glassman saw the management discussion and analysis section of annual reports as the main vehicle for forward-looking and value related information, rather than a new form of financial statement. Nielson (2005) also argued that it was time to move on from the unproductive debate over measuring intangibles from an accounting perspective, and to focus on complementary methods of business reporting, including the use of non-financial performance measures, from a strategy and value creation perspective. This view sees financial statements as lagging indicators of performance for stewardship purposes, and that

another form of reporting using leading indicators is required to report on future value creation expectations for valuation purposes.

Nielson (2005) expressed the view that reporting from a strategic perspective constituted a new reporting paradigm. This perspective may in turn open up such issues as an overload in the quantity and complexity of information disclosed, different interpretations of the same information by different users, different information needs among different user groups and inconsistencies for making comparisons between companies and over time.

Not all aspects of intangible assets are ignored by present accounting approaches. Some of the components of the generally accepted taxonomy of intellectual capital are already measured in traditional accounting systems. Notable among them are human resource development costs such as training, marketing and advertising expenditure (especially in brand development), research and development expenditure and knowledge sharing activities. The difference is that these items are traditionally seen as current expenses in accounting, whereas the proponents of intangible assets regard them as an investment to build the future value of the company. Arguably, at least some of such expenditure creates balance sheet assets rather than just current operating expenses. Such assets may depreciate in value over time; but obvious difficulties arise when deciding on their depreciable lifetimes, and some such assets (e.g., brands) may continue to appreciate in value over a very long period. This is reflected in the impairment as opposed to depreciation approach that has been adopted in IAS 38.

It is becoming clear that the option of adding an accounting of a company's stock of intangible assets or intellectual capital to its financial balance sheet is a misconceived notion, which both undermines the stewardship reporting function of the financial accounts and fails to fully address the implied aim of reporting on future value creation. It follows that intangible assets are less an accounting issue than a forward-looking management issue.

2.15.3 Non-Financial Scorecards

The alternative of disclosing intellectual capital in non-financial terms, while not a precise quantification, can be seen as shedding valuable light on the future earnings capability of a company. It falls short of being a comprehensive forward-looking statement of its future value creation capability and projections, which is the next logical but even more challenging step for management to take. It does, though, enhance an external observer's ability to make his own independent judgements about a company's future earnings potential.

Scorecard approaches bypass the serious difficulties encountered when attempting to measure the monetary value of intangible assets. They can be used externally as indicators of the intangible assets and their changes in quantity and performance over time, but more commonly they are used as an internal strategy and performance management tool.

The most common non-financial scorecard approach is the *Balanced Scorecard* (Kaplan & Norton, 1992, 1993, 1996a, 1996b, 2001). Its focus was on internal and customer performance considerations, and it was not until the concept was recently developed into strategy mapping that intangibles became an important component (Kaplan & Norton, 2004b).

Mouritsen, Larsen & Bukh (2005) compared the *Balanced Scorecard* with the intellectual capital concept. The fundamental difference they observed was in the underlying approach: the *Balanced Scorecard* is a cause and effect strategy tool with its origins in the value chain and competitive advantage strategy work done by Porter (1980, 1985), while the intellectual capital approach is more oriented towards the internal development of a bundle or network of core competencies (Hamel & Prahalad, 1994). They do not portray these two approaches as incompatible. Sveiby (2005), for example, suggests using the two perspectives together as complementary business strategy development approaches.

Brewer (2004) introduced the concept of a *Value Dynamics Framework* to link strategy to a balanced scorecard. As with the balanced scorecard framework, this approach takes a narrow

viewpoint on stakeholder interests. A refinement of this model, the *Performance Prism* (Neely, Adams & Kennerley, 2002), was developed to address the shortcomings the authors saw in the balanced scorecard's ability to address intangible assets and broader stakeholder accountabilities in the performance measurement and management of a company.

Focusing specifically on intellectual capital, the *Intangible Asset Monitor* (Sveiby, 1997), *Skandia Navigator* (Edvinsson & Malone, 1997), *IC Index* (Roos, Roos, Dragonetti & Edvinsson, 1997), *IC Rating* (Edvinsson, 2002), *Value Chain Scoreboard* (Lev, 2001), and *ValueReporting*® (DiPiazza & Eccles, 2002) are examples of proprietary intellectual capital measurement scoreboard solutions that have been used commercially. Marr & Schiuma (2001) proposed a non-financial knowledge audit cycle to help develop an organisation's knowledge capabilities.

Roos, Pike & Fernström (2004) assessed the main contemporary score card methods according to five axioms for an empirical relation system that were developed by M'Pherson & Pike (2001): completeness, distinctness, independence, agreeability and scaling. They added a further three desirable practical criteria: does not impose a large measurement overhead, facilitates strategic and tactical management, and generates the information needed by shareholders and investors. They considered that none of the scorecard methods in use met all these criteria. Their main criticism of the endogenously developed scorecard approaches is that value lies in the eyes of the beholder, and that these measures of value take insufficient account of the exogenous viewpoint of external stakeholders. Each stakeholder will view value from a different perspective (Chatzkel, 2002, p. 105).

In a pioneering move, the Danish Government has issued guidelines for Danish companies to formally report intellectual capital statements (DATI 2001; and a revision in DMSTI, 2003a). These flexibly structured reports consist of a knowledge narrative on the use to which a company's intellectual capital is being put, a set of management challenges, initiatives being taken, and relevant indicators of progress.

Koller, Goedhart & Wessels (2005, p. 528) referred to three key elements in a compelling investment story, "aspirations, strategy and evidence." The similarity between these elements and the components of the Danish guidelines reflects the Danish Government's motivation of encouraging investment in Danish companies.

The Danish guidelines differ from the static scorecard approaches to intangible asset measurement in that they emphasise the dynamic flow of intangible resources to create value rather than the measurement of the company's current stock of intellectual capital. Just as Koller, Goedhart & Wessels (2005, p. 528) emphasis on the need to align a company's reporting with its value creation strategy, the Danish guidelines explicitly encourage Danish companies to report on their value creation strategies. A broad framework of guidelines for the management and disclosure of intangible assets was also developed by the European Union (Meritum, 2002), which has many similarities to the Danish approach.

2.15.4 An Exogenous Perspective

In the proprietary *Inclusive Valuation Methodology* (M'Pherson & Pike, 2001), non-financial intangible performance is valued from the point of view of stakeholders – their perceived value for money – on each of the value generating dimensions that are relevant to the context. In this axiology, the inclusive stakeholder valuations of the non-financial output stand alongside the financial measurement of output, and are not forced to become additive measures. The *Holistic Value Added* methodology adopts a similar approach (Roos, Pike & Fernström, 2004).

Funk (2003) reviewed the concept of a *Value Creation Index* to measure intangible performance measures that drive shareholder value, noting that industry-specific weightings for different value drivers are appropriate. The value drivers identified are broad ranging across social, environmental, leadership, innovation, alliances, human capital, product quality and other intangibles. Funk proposed a company-specific sustainability model, defining sustainability at a company level within the context it operates, in a more pragmatic and

broad-ranging way than just limiting it to social responsibility and environmental considerations.

In their evaluation of established methodologies, Roos, Pike & Fernström (2004) found the *Holistic Value Added* methodology was the only one that came close to meeting their criteria, but not as well as the new proprietary *SEER* (Burgman & Roos, 2004) methodology that has recently been developed in conjunction with Accenture. It was later renamed as the *Future Value Management*® methodology (Roos, 2005). This model defines desired future value from a stakeholder perspective without being confined to monetary measurement, and orientates the value creation processes within a company to deliver that future value. In this approach they saw the potential to move forward to a new generation of intangible asset measurement methods.

These emerging approaches broaden the range of potential participants in the intangible asset discourse to include all stakeholders who are involved with developing, implementing and benefiting from a company's strategy. They integrate the value creation roles of both tangible and intangible assets, and emphasise valuing outputs rather than stocks of assets. Lev & Daum (2004) emphasised the need to take a holistic view of the value creation process, and noted that doing so led to the distinction between assets and operations becoming blurred.

The holistic integration of financial performance and non-performance measures, and the inclusion of the interests of a wide range of stakeholders, is at the leading edge of the theory and practice of company reporting to provide meaningful information.

2.16 Strategy Management

A convergence between the intangible assets debate and the business strategy debate is becoming apparent. The evolution of the intangible assets discourse to address the stakeholder perspective and value creation strategies, the key concepts inherent in the *Future Value Management*® methodology, overlap with the key concepts discussed in the contemporary business strategy literature.

This convergence is illustrated by the recent move by Kaplan & Norton (2004a, 2004b) to incorporate intangible assets within their *Balanced Scorecard* concept and their associated strategy mapping methodology. Kaplan & Norton (2005) also advocated a central coordinating role for strategy in senior management – an "office of strategy management" – to bridge the gap between strategy and execution to improve value creation performance. This recommendation placed the cross-functional coordination of a company's strategy, including its value creation through intangible assets, at the centre of its management processes.

Other strategy writers also reflect this convergence. Kenney (2005), for example, emphasised the need for strategy to be externally driven, by external stakeholders and the competitive market, as is the case in the *Future Value Management*® methodology. In another example, Phelps (2004) distinguished between the value drivers underlying the generation of value in the present performance level of a company, and the value builders underlying the growth of its future value: present and future value combine in the market value. He divided value builders into two categories: those concerned with positioning the company – its strategy, investments, partnerships, patents, distribution levels – and those concerned with capabilities – management quality, organisational culture, technical expertise, etc. This approach reflects the holistic view of value creation that is found in the *Future Value Management*® methodology, and has similarities with the detail in the Danish intellectual capital statement guidelines.

Otley (2003) advocated a shift of emphasis from performance measurement to performance management, and a balanced approach to managing the overall dynamics of a company's performance. A parallel is seen in the shifting emphasis from measuring to managing intangible assets in the value creation process. Ballow, Burgman & Molner (2004) took this viewpoint a step further when they pointed to the need to devote sufficient resources to managing future value performance, not just current performance.

2.17 Summary

This Chapter provided a discussion of how intangible assets have moved beyond being a challenging accounting measurement problem. They have evolved in the literature to be seen more as knowledge resources at the centre of contemporary business strategy and management processes aimed at creating future value; and their value is now seen to lie in how they are used, rather than in a static individual resource sense corresponding to the value of a tangible asset.

The earlier static perception of intangible assets saw them as a balance sheet stock item – as intellectual or knowledge capital – to be accumulated, measured and recorded. Attempts to explicitly measure intangible asset values, and their capability to create value, have struggled with challenging definitional and conceptual problems. Multiple external influences at play, especially macroeconomic changes, have compounded the measurement and conceptual difficulties.

This Chapter has reviewed at length the reasons why progress within this previously dominant resource-based paradigm has ground close to a halt in recent years as it approached a crossroads (Marr & Chatzkel, 2004). That earlier positivist paradigm has now been left behind by most researchers (Nielson, 2005), following in the path of its predecessor, the now defunct 1970s human resource accounting movement.

Interest is now evolving to view intangible assets from a dynamic perspective. This perspective assigns value to intangible assets not as a resource or stock item, but when they are used. This perspective argues that until they are used, intangible assets are inert: of little or no value compared to the potential value they can create when used. Significantly, when a group of intangible assets are used innovatively in concert with each other and with other resources, the aggregate value created is likely to far exceed the sum of their contributions to value creation as individual items. The measurement challenge is that there are an infinite

variety of creative ways this value can be realised. Moreover, this value can be meaningfully assessed from the different viewpoints of different stakeholders.

This dynamic perspective has moved the context from accounting to corporate governance and management, and the measurement interest from historical to future value. By interpreting intangible assets as knowledge resources, and combining them innovatively, often across traditional boundaries, companies can find new strategies to add value, potentially on a large scale. The interest in the intangible assets research community is now moving on to the management processes and strategy development for knowledge resources, and to the related future value measurement and disclosure issues.

3 Disclosure of Intangibles

3.1 Literature Review: Disclosure

Chapter Three presents a discussion on the theoretical foundation for those corporate information disclosure practices that are mandated by regulatory authorities, and those that are voluntarily followed by companies; and finds, instead, pragmatism, arbitrary decisions and game theory. Disclosure must logically have an audience, and this section reviews the stakeholder perspective. Its focus is on the interests of investors and financial analysts, who are identified as the primary audience for a company's value creation strategy disclosure.

A review is made of the small and relatively recent body of literature that has been published on the disclosure by companies of their intangible assets. Although transparency is a dominant theme in today's more open economies, there have been few empirical studies into intangible asset disclosure. As we will see in this section, the definitional difficulties researchers face with intangible assets as a construct have carried over to mixed results from these studies, and significant methodological issues.

The disclosure of a company's financial outlook embodies its management's view on future value creation, including the role of its intangible assets. From the perspective of the stakeholders with the main interest in this information, perhaps investors and financial analysts, this form of disclosure has potentially high utility. In an ideal world, outlook projections may be the ultimate form of intangible asset and value creation disclosure and transparency. However, they appear to be only rarely available. The inner value creation workings and forward-looking expectations of many companies remain a "black box" to most outsiders. Their intangible asset disclosures leave investors and analysts to make their own projections based on their perceptions of the company's ability to perform within the broader macroeconomic and competitive business climate. Whether or not this emerging disclosure "game" between companies and investors is a fertile area for future regulation is then considered.

3.2 Transparency

Greater transparency has come with a more open society and easier access to information and means of communication. A company now finds it difficult to conceal unfavourable news in the face of an active news media, persistent enquirers in special interest groups, internal whistleblowers, anonymous internet bloggers, and other influences. Tapscott & Ticoll (2003) believed the result has been a power shift from companies and their managers to their customers, employees, shareholders and other stakeholders, but that this can be positive if handled proactively. Transparency in this context can become in part a defensive public relations strategy, consistent with the game theory model of voluntary disclosure proposed by Dye (2001).

Greater transparency exposes a company to greater potential costs, not just of managing the process, but also from the risks of compromising the company's competitive position and increased exposure to litigation. As a result the voluntary disclosure content of annual reports is mainly context-building or branding-related (Nielson, 2004b). Regulating transparency is rendered difficult by the varying perceptions of managers and stakeholders as to what is the appropriate degree of transparency for them in each case (Nielson, 2005): like beauty, transparency is in the "eyes of the beholder" (Nielson, 2004a, p. 33).

3.3 Disclosure

Disclosure has been defined by Pike, Rylander & Roos (2002) as follows:

> *Disclosure should provide relevant, reliable and timely information to those who need to know it so that they can make decisions concerning their relations with the company. At the same time, the information released by the company must not lead to the compromise of sensitive strategic information that would otherwise give unfair advantage to others.* (p. 665)

They envisaged that the role of intellectual capital reporting should be concerned with forward-looking value creation in contrast to the reporting of historical value realisation in financial accounts.

In a review of disclosure Verrecchia (2001) concluded:

> *The practical issue is that there is no comprehensive, or unifying, theory of disclosure, or at least none that I felt comfortable identifying as such.* (p. 98)

Healey & Palepu (2001) reviewed existing research that suggested the justification for regulated disclosure lay in market imperfections and externalities. One justification they found is that the cost to present owners of providing free information for the benefit of prospective owners implied that disclosure is a public good, and may be under-supplied unless regulated. Another justification they identified is that unsophisticated investors need to be protected by mandatory disclosures. However, Healey & Palepu (2001) also noted that empirical research in this area was "virtually non-existent."

Dye (2001) agreed that there was no theory of the regulation of disclosure, but suggested there was a theory of voluntary disclosure, as follows:

> *The theory of voluntary disclosures is a special case of game theory with the following central premise: any entity contemplating making a disclosure will disclose information that is favourable to the entity, and will not disclose information unfavourable to the entity.* (p. 184)

Accordingly, observations of omissions or silence in company disclosures may be as valuable to astute users of a report as the information that is disclosed. Milgroom & Roberts (1986) and Shin (1994, 2003) researched this persuasion, or manipulative form of disclosure, as a special case of game theory where the party making the disclosure has an interest in the consequences. In an example of the way this game is played, Shin (1994) found that a low price to earnings ratio was associated with positively skewed disclosures, which suggests it is common for companies to attempt to "talk up" their share values.

The potentially high cost of revealing strategic information to competitors is a drawback of transparency (Vergauwen & van Alem, 2005, p. 92). This outcome was empirically examined by Garcia-Meca & Martinez (2005), who reported that disclosures to analysts by a sample of Spanish companies was low in research and development and innovation information, which they attributed to a reluctance to reveal competitively sensitive information. Jin (2005) found that although firms use voluntary disclosures to differentiate themselves from their competitors, their disclosure rates were found to be lower in highly competitive markets. Healy & Palepu (2001) found some empirical evidence that increased disclosure did enhance liquidity and demand for securities. A motivation for the Danish Agency for Trade and Industry to promote the disclosure of intellectual capital statements was to facilitate access to finance for small to medium enterprises, through better explaining their value creation strategy in their reports (Bukh, 2003, p. 51).

Lang & Lundholm (1993) found a positive association between the level of voluntary disclosure and return variability, firm size and the need to raise capital. Meek & Roberts (1995) also found that larger companies were more likely to make voluntary disclosures. Eng & Mak (2003) found that voluntary disclosure is likely to be greater in larger firms, and by those with lower debt; and that lower managerial ownership and increased government ownership of a firm led to higher levels of disclosure. In a review of management accounting research, Ittner & Larcker (2001) concluded there was a link between value creation and disclosure:

> *... the value driver analysis should not only influence the choice of action plans and the design of control systems, but should also affect external disclosure requirements.*

Botosan & Plumlee (2002) found that greater total disclosure is not associated with a lower cost of capital in the US. While they found annual report disclosures were associated with a slightly lower cost of capital, this was offset by more frequent and timely disclosures that appeared to increase the cost of capital, especially in companies with a higher analyst following. They suggested that the explanation for the unexpected higher cost of capital with

timely disclosures was related to "transient" traders – noise traders – being attracted into the market, whereas annual report disclosures were of more interest to long-term investors. This counter-intuitive finding attracted the interest of Gietzmann & Ireland (2005) who applied the investigation to United Kingdom firms and suggested the method of measurement of timely disclosures and differences in accounting policies may be explanatory reasons for the increasing cost of capital observed by Botosan & Plumlee (2002). Hail (2002) observed a reduced cost of capital for more forthcoming firms in Switzerland. Francis, Kurhana & Pereira (2005) also observed an inverse relationship between voluntary disclosures and the cost of both equity and debt capital in an international sample of companies. The weight of evidence points to there being a cost of capital benefit for a company that makes greater levels of voluntary disclosure in its reports, but the Botosan & Plumlee (2002) findings point to the risks that could arise if the target audience and the medium for communication are not managed appropriately.

Corporate voluntary disclosure is a pragmatic decision, with some companies finding substantial benefits from higher levels of transparency (Tapscott & Ticoll, 2003) while others limit their reports to the minimum amount of disclosure required for compliance. The question of what constitutes sufficient meaningful reporting of a company's intangible assets includes the extent to which a company discloses its stock and, more relevantly, its use of intangible assets as part of its strategy to create value, now and in the future. One unresolved question remains that of how much of its internal value creation processes should a company disclose externally? The Securities Commission's guidelines (see section 3.8) offer the lead for such disclosures in New Zealand. At one end of the spectrum is the choice to make no voluntary disclosure related to intangible assets – which may attain reporting compliance in a rules-based regulatory regime, but not necessarily in a principles-based regime as in New Zealand. In the middle ground, companies may choose to report non-financial performance indicators (Roslender, 2004), and disclose intangible assets to the extent permitted by accounting standards as balance sheet assets (e.g., goodwill, intellectual property,

development projects) and as expenses (e.g., training, research). This level of disclosure may be seen as an aid for investors and analysts to make their own value estimates. At the other end of the spectrum lies the option for the company to take the bold step of disclosing explicit financial performance projections as the forecast outcome of the internal management "black box" processes of value creation.

To decide where they position their disclosure policy on this spectrum, companies must weigh up the benefits of reducing the asymmetry between the information possessed by managers and that possessed by the capital markets, and the disadvantages that may result from having to deal with more informed competitors, customers and suppliers. Ackerlof's lemons problem (Akerlof, 1970) suggests that the market tends to discount good performing companies to the average price if the asymmetry of information means they cannot distinguish between good and bad performers. Accordingly more disclosure, to reduce asymmetry and uncertainty, is likely to improve a good performing company's market value (Healy & Palepu, 2001).

3.4 Disclosure to Which Stakeholders?

To have meaning, disclosure needs to be targeted at an audience, which today could encompass a wide range of *stakeholders.* The responsibility of directors is to the company, and they decide who is the audience for their company's voluntary disclosures:

> *In the UK corporate governance model, with its unitary board structure, directors owe their fiduciary duties to the company...Their duties are owed to the company, not to the shareholders or stakeholders – though they are accountable to the shareholders for the stewardship of the company. The statutory duties of the directors towards other parties besides the company are minimal. Indeed there is no explicit duty (in a solvent company) to stakeholders such as employees, customers, suppliers and the wider community ... However a board decides to treat stakeholders (which will change as circumstances change), the important point is that it recognises it has to take a view and maintains what it regards as a proper balance of interests. It is the board's*

responsibility to lay down principles to follow in relation to stakeholders and to monitor the way those principles are put into effect. (Summerfield, 2001, pp. 91-93)

There are material international differences of viewpoint, especially between the Anglo-American model where the shareholder is by far the dominant stakeholder and the European model where the interests of a range of other stakeholders, including employees and the wider community, have long been given recognition (Saracuse, 2004). There are also differences in the interest non-shareholder stakeholders may have between private and publicly listed companies. Ritchie & Richardson (2000) reviewed the different governance issues in smaller companies. Industry sectors with operations that can have a significant external impact, notably mining, forestry, petroleum and multi-national companies, are more likely to attract the attention of a wider audience of external stakeholders.

There are political and economic theory differences of viewpoint (Danley, 1994). The classic liberal position can be summarised as follows:

Few trends could so thoroughly undermine the very foundations of our free society as the acceptance by corporate officials of a social responsibility other than to make as much money for their stockholders as possible. This is a fundamentally subversive doctrine. (Friedman, 1982).

The opposite collectivist socialist view, to which Friedman was openly opposed, has little traction a quarter of a century later. But there is now a more pragmatic opposing view, driven by the very market forces the classic liberals advocate releasing, that is now widely held:

Many companies today recognise that achieving excellence in environmental, safety, health, employment, and community practices are part of long-term value creating strategies. (Kaplan & Norton, 2004b, p. 190)

This pragmatic approach can be traced back as far as Berle & Means (1933), and there is an opinion that the Friedman viewpoint was a temporary shift away from a long-standing more pragmatic approach:

> *In earlier eras a company's success was judged by a mixture of measures, including fundamental economic performance, reputation with customers and employees, stock price and responsibility to society at large. That changed in the 1980s and 1990s.* (Davis, 2003, p. 116).

Kaen (2003) also traced the development of the viewpoints on these questions since the concept of the company was introduced. Ansoff & McDonnell (1990) predicted that:

> ... *strategic management will increasingly blend technological and socio-political variables with economic and competitive variables.* (p. 482)

They suggested that the difficulty in achieving a critical mass to compete effectively in a barrier-free world market will lead to new forms of cooperation among firms, breaking down the traditional stand-alone independence of the individual firm. Other recent literature, such as that from Tunzelmann (1996), Cadbury (2002), Kaen (2003) and Saracuse (2004), supports the perception that the pragmatic approach to involve the interests of a range of stakeholders in a firm's affairs is again in the ascendant. Semler (2003) illustrates this approach from a practitioner's viewpoint:

> *What, if not growth or profits, constitutes success? A balanced mix, where all do well. Where stockholders, employees, clients, suppliers and community are all canvassed for their opinions, and where this three-dimensional exercise results in a complete picture. We are working on such a scorecard, one that will enable us to compare progress, anticipate trouble and tweak our priorities. After all, we want to be able to exchange revenue-based evaluations for something much more complex. By evaluating success from everyone's different point of view, we believe we'll land on the new list of companies that unite sustainability with all-round gratification. Lets call this list the Fortunate 500.* (p. 99)

Balancing the interests of several stakeholders is a challenge for company boards. In particular, the presently controversial question of an effective and fair executive

compensation model is a key driver for seeking improved performance measurement beyond the traditional accounting measures (Donaldson, 2003).

With significant international, political, size, structural, sectoral, and temporal differences of opinion and circumstance about the role of other stakeholders relative to shareholders, and their performance measurement and reporting needs, each company has to explicitly adopt a position within its unique context. The normative values held by the board, and its competitive market position and business strategies, are considered to be key considerations (Stead & Stead, 2004). While there is a broad range of stakeholders interested in other non-financial performance measures, the audience for disclosures related to the value creation role of intangible assets is primarily investors and financial analysts.

3.5 Investors and Financial Analysts

Investors and financial analysts represent the demand side for intangible asset and value creation disclosures. In much of the disclosure and intellectual capital literature there are implied normative assumptions made that more disclosure is better; that non-financial and intangible assets *should* be disclosed. The Jenkins Report (AICPA, 1994) defined business reporting as information supporting capital-allocation decisions, and advocated more forward-looking disclosure for the benefit investors and analysts (subject to adequate litigation protection). This supply-side perspective underlies the proposals that intangible assets should be accounted for in financial balance sheets, where the stewardship role of financial accounts and the going concern valuation interest in intellectual assets have been confused (Roslender, 2004). However, from a demand-side perspective, there are two key questions that remain inadequately answered in the literature:

- As key stakeholders, what information disclosures about a company do present and potential investors and financial analysts require?
- Are they really interested in non-financial and intangible asset disclosures?

Bukh & Johanson (2003) concluded that stakeholders were ambivalent about the value of more non-financial information disclosure, especially intangible asset information. The low levels of intellectual capital disclosure found around the world (Guthrie & Petty, 2000, and subsequent related studies) may simply reflect a low demand for the disclosure of this information. In a study of what United Kingdom users would like disclosed in an annual report, Beattie & Pratt (2002) concluded that:

> *The items rated most highly by groups tended to be selected financial items, broad objectives and strategy, and selected MDA [management discussion and analysis], background, risk and innovation value driver items. ... Perhaps surprisingly, all process and employee value drivers and intellectual capital disclosures rated very much in the lower orders. Environmental/social/community items were rated very low, as they were not seen to be relevant to the investment decision.* (p. 19)

On the other hand, Koller, Goedhart & Wessels (2005) concluded that stakeholders did use this information:

> *Companies can increase transparency and valuation accuracy by improving their historical financial reporting and, most importantly, by reporting the underlying nonfinancial [sic] drivers of performance* ... (p. 530)

Kothari (2001), in a review of capital markets research, found that almost all models of company valuation use earnings forecasts, based on fundamental research. This school of thought captures the view that better access to capital at a lower cost is available to companies that are more open about their performance and prospects. Healy & Palepu (2001) found some earlier empirical support for this view, supported more recently by Hail (2002) and Geitzmann & Ireland (2005). Botosan & Plumlee (2002) found contrary results. In a study of fund managers' behaviour, Holland (2002) found that they did have a strong focus on understanding the processes of value creation within a company, including the role of intangible assets. He found they would use this understanding to remove from their portfolios companies that were very poor performers or were "black holes" whose value creation

processes they could not understand. They would pick winners and losers according to the expected effects of their macroeconomic forecasts on each company's value creation processes. Marr, Gray & Neely (2003) reviewed earlier similar evidence. However, greater information appears to make it more difficult for analysts to effectively assimilate disclosures (Plumlee, 2003).

Bukh (2003) observed an increasing "intellectual capital content" in the prospectuses published for new companies listing in Denmark, and noted that this appeared to be in response to the demand for it by investors and analysts. In a more detailed study, Bukh, Mouritsen, Nielson, Johansen, & Gormsen (2004) found a close correspondence between the content of the Danish intellectual capital statement guidelines (DMSTI, 2003a) and a sample of prospectuses in that country. A prospectus typically contains more future-oriented content than an annual report, and the justification of financial performance projections with an explanation of the value drivers, including intangible assets and how they are used, is an important means to obtain investor support for an issue of new securities.

Garcia-Meca & Martinez (2005) analysed the content of briefings given by a sample of companies to financial analysts in Spain. They found intellectual capital issues accounted for less than 20% of the items disclosed, and unsurprisingly noted that there appeared to be a low level of disclosure of competitively valuable information, especially on the innovation and research and development activities of the companies. This behaviour is compatible with the game theory of voluntary disclosure suggested by Dye (2001), and suggests some companies are selective and manipulative in their disclosures to analysts. Further evidence for this observation comes from an international study by Francis, Kurhana & Pereira (2005), who found that companies that are more dependent on external financing are more likely to provide a higher level of voluntary information disclosure in their reporting.

Rylander, Jacobsen & Roos (2000) reviewed research that showed analysts and investors did use non-financial information but they did have credibility concerns about depending only on the information companies disclosed. Credibility was improved if long term value drivers

were shown to be deeply rooted in a firm's strategy, the effectiveness of its strategy execution was demonstrated with quantification and if disclosures were comparable over time, comprehensible, standardized and externally audited.

In the context of United States of America moves to regulate the equitable distribution of voluntary disclosure to analysts, in place of selective of personal briefings, Aryn, Glover, Mittendorf & Narayanamoorthy (2005) raised the risk of herding behaviour by analysts, which they suggested could reduce the incentives for companies to disclose information. Information in annual reports is widely available, and if this risk is realised it may be a threat to future increases in voluntary disclosure in annual reports.

3.6 Disclosure Studies

Skandia was the first company to specifically publish an intellectual capital disclosure report as a supplement to its annual report (Edvinsson & Malone, 1997). The company published seven such reports, each addressing a different aspect of intellectual capital, between 1994 and 1998 (Mouritsen, Larsen & Bukh, 2001; Skandia, 2005). These reports were innovative and attractively illustrated reports, mainly non-financial in content, which aimed at conveying the value creation capability of the company and how this strength was being developed to support future growth. The target audience was primarily the company's shareholders. In retrospect, and warning against the use of intellectual capital reporting for public relations purposes, Sveiby (2005) commented:

> *It seems that Skandia's share price, for a while at least, benefited from the company being one of the pioneers in IC reporting according to presentations made by Skandia managers during the boom years 1999-2000. However, those who bought Skandia shares based on their IC supplements back then were looking at losses amounting to 90% in 2002! So unless shareholders are prepared to ask the why, the costs for intangibles reporting may come out of their own pockets in the end.*

The Dow Chemical Company in the United States of America was also an early pioneer in creating value through developing its intellectual capital. It had a particular focus on how to manage intellectual property in better ways to reduce costs and increase revenues (Stewart, 1997). A check of the latest (2004) annual reports from these two early leaders in the move to disclose intellectual capital revealed that neither Skandia nor Dow Chemical now provide any material disclosure of intellectual capital, let alone a specific intellectual capital statement.

Other Scandinavian companies have followed Skandia's lead, particularly in Denmark where there are now published government guidelines for the content of voluntary intellectual capital statements, which are defined (DATI, 2001, p. 104) as:

> *A method of reporting that shows the company's efforts aimed at building up, developing and increasing the effectiveness of its knowledge resources in the context of employees, customers, technologies and processes. The intellectual capital statement is intended to support and communicate the development of the company's knowledge management strategy. Normally, and in this guideline as well, this definition is used about the statement as such and not only about the quantitative indicators.*

As shown in Table 3.1, Ordonez de Pablos (2004) identified a limited number of companies, mostly in Europe but more recently also some in India, that have adopted the practice of disclosing a specific intellectual capital statement.

Table 3.1: Intellectual Capital Statement Practices

Country	*Companies*
Sweden	Celemi
Denmark	Carl Bro, Cowi, Dieu, Systematic
Italy	Intercos, Plastal
Spain	BBVA Group, Bankinter, BSCH, Caja Madrid, Union Fenosa
Austria	ARCS
Germany	DLR
UK	EES Group
India	Balrampur, Chini Mills, Nanveet, Reliance, Shree Cement

Source: Ordonez de Pablos (2004)

It can be observed from Table 3.1 that intellectual capital statement reporting is mainly a European phenomenon at present, and that it has not yet developed into a widespread practice, although DMSTI (2003a) suggested that around 100 smaller Danish companies have also adopted the intellectual capital statement reporting guidelines. A search of company web pages in English for Celemi, Carl Bro, Cowi, Dieu, ARCS and EES revealed that these companies are primarily consulting, training or research enterprises, which centre their businesses very strongly on their specialised knowledge and competence.

While specific intellectual capital statements play a relatively small role in intangible asset disclosure, voluntary non-financial disclosures, including of intangible assets, are included in a less formal way within company annual reports. International research has been undertaken to assess the extent of this disclosure: most found low levels of disclosure.

Research to determine the extent of the disclosure of intellectual capital in the standard annual reports published by companies was pioneered in Australia by Guthrie & Petty (2000) and in Canada by Bontis (2003). Both used content analysis, but in different ways. These two studies have been repeated with variations in several other countries.

The stream of research started by Guthrie & Petty (2000) began when they described their methodology for applying content analysis in intellectual capital disclosure research in a study of Australian company annual reports, and inspired repeated use of the methodology with

little modification elsewhere. Guthrie, Petty, Yongvanich & Ricceri (2004) published a review of the methodology. In this approach, sentences in annual reports are coded as to their content in relation to the intellectual capital framework developed by Sveiby (1997). Guthrie and Petty (2000) applied this method to 20 Australian company annual reports to evaluate the penetration of intellectual capital into disclosure practices. Little evidence was found that intellectual capital was either being measured or reported, and most of what was disclosed was human or internal in nature. However, in supplementary research, they found that Australian company managers appeared to understand the concepts of intellectual capital to a greater degree than the disclosure level implied. The lack of an agreed measuring and reporting guideline for intellectual capital disclosure was noted as a possible explanation for this discrepancy.

A study by Brennan (2001) using the same method in Ireland found a similar low level of disclosure, but with a greater externally oriented content than the internal orientation found among Australian companies. Subsequent work (O'Regan, O'Donnell, Kennedy, Bontis & Cleary, 2001) established that there was also an awareness of the strategic importance of intellectual capital among the managers of Irish companies, beyond the level reflected in the disclosure evident in annual reports.

A similar study in South Africa (April, Bosma & Deglon, 2003) found a more promising but still low level of disclosure in a sample of 20 companies in that country. An interview study again found that the low level of disclosure understated the level of understanding of the role of intellectual capital among company managers, and again pointed to the lack of reporting guidelines as an explanation for the low level of disclosure.

Ordonez de Pablo (2003) repeated the methodology in Spain, and once again observed a low level of intellectual capital disclosure. Ordonez de Pablo particularly noted the lower levels of disclosure found in Spain than among companies in Sweden and Denmark, where there had been greater public debate on intellectual capital disclosure.

A similar study of 30 Italian companies conducted by Bozzolon, Favotti & Ricceri (2003) reported a more promising level of disclosure, and like Brennan noted an emphasis on external aspects (customers, distribution channels, business collaboration and brands) more than the internal and human capital aspects. They found larger companies, and those with a higher public profile, disclosed more intellectual capital information.

Goh & Lim (2004) also found a higher level of disclosure among a sample of 20 Malaysian companies compared to the Australian study, and again noted a greater emphasis on external aspects of intellectual capital. They also noted the descriptive as opposed to quantitative nature of disclosures being made.

In New Zealand, Wong & Gardner (2005) studied 60 companies using the same research method with a few modifications, including adjustments for the quality of the disclosure. As in Australia, the disclosures of intellectual capital in New Zealand were found to be at a low level, but higher for larger and internationally multi-listed companies. The most common disclosures related to intellectual property, customers and employees.

In a related study Miller & Whiting (2005) found no relation between the level of intellectual capital disclosure assessed using the same intellectual capital content analysis and the "hidden value," which they defined in two ways, the second adjusted to reflect replacement asset values, as:

$$HV = (MV - BV) / MV$$

$$Adjusted\ HV = ((MV - BV) + ARR) / MV$$

where:

HV is the "hidden value"

MV is the market value of the firm

BV is the book value of the firm

ARR is the asset revaluation reserve, used to estimate asset replacement values

They concluded from their empirical findings that "hidden value" may not be a good proxy for intellectual capital, just as it was shown in Chapter Two to have theoretical shortcomings as a measure.

Although the Petty & Guthrie method permits some qualitative assessment of the disclosures (e.g., as used by Wong & Gardner, 2005), and categorises disclosures as recommended by Sveiby, it is mainly a quantitative measure that values the frequency of mention over the quality of the content. Unfortunately, the quantitative approach may be distorted by verbosity and repetition. The effective use of intangible assets to create value is not directly measured. As such, the method is more useful at detecting the *presence* of intellectual disclosure more than the *quality* and *usefulness* of the disclosures. In spite of the attraction of its potential for quantitative statistical rigour (Wong & Gardner, 2005), the method has become increasingly subjective in practice, especially through the different taxonomies and definitions that have been adopted. This is highlighted by the difficulties encountered when attempt is made to make meaningful comparisons over time and between countries in the several studies that have been done using this method (Steenkamp, 2005).

The approach adopted by Bontis (2003) in the second main stream of disclosure studies used content analysis differently. A selection of words and phrases was prepared with help from a panel of researchers at an intellectual capital conference to represent a usage that would indicate reporting on intellectual capital matters. These phrases were chosen as indicators that the reports disclose intellectual capital content. Text searching software was used to measure their frequency of occurrence in the annual financial statements of 10,000 Canadian companies. Only 68 companies returned a positive result, which indicated a very low level of penetration of intellectual capital into the annual report disclosures among Canadian companies, which the researcher considered surprising in view of the interest that had been shown in the subject in Canada. This observation suggests there may also have been a gap in Canada, similar to that found by Guthrie & Petty (2000) and subsequent studies, between the understanding of intellectual capital by company managers and the level of disclosure that

was made in annual reports. However, the reports used by the Bontis (2003) study were described as the filed financial statements on official computer records, and may not have included the full management commentary that was also considered in the other disclosure studies reviewed here.

Vergauwen & van Alem (2005) used the Bontis (2003) method and terminology to search the annual reports of 178 companies in The Netherlands, France and Germany for the two years 2000 and 2001. They found a significantly higher disclosure rate in company reports than in Canada: 16.7% of companies in The Netherlands, 10.8% in France and 3.6% in Germany. They noted there was a higher level of business debate about intellectual capital issues within The Netherlands than in the other two countries, which may account for the higher level of disclosure in that country. Again, the content disclosed in financial statements mainly related to information systems, intellectual property and economic value added, which are broad generic terms that do not necessarily support the view that these companies were using intellectual capital as a strategy to create value. They also noted the lower level of intellectual capital disclosure in the financial statements of the companies they surveyed compared to the full reports including commentary, which may have also led to the very low level of disclosure found by Bontis (2003).

Guthrie, Petty, Yongvanich & Ricceri (2004) noted the advantage of using a sentence-based content analysis approach over just looking for words and phrases, but a more significant issue with the Bontis (2003) method may lie in the relatively specialised nature of the words and phrases selected. Gray, Roos & Rastas (2004) used a different word and phrase based content analysis of intellectual capital reporting in 95 United Kingdom companies involved in information technology. They too found a low level of disclosure, all of it descriptive, and concluded that, while there is management recognition of the importance of intangibles in the United Kingdom:

> *... companies ... still do not seem to know what and how to report on intangibles as tools and practices are not developed in order to secure valid measurement, presentation, evaluation and interpretation outcomes to intangibles.* (p. 260)

In one of the few US-based intellectual capital disclosure studies published, Abdolmohammadi (2005) produced a lexicon of 58 key intellectual capital words. He then conducted a content analysis, using a method similar to that used by Bontis (2003), on the annual reports of 58 S&P 500 companies over the period 1993-97. Again, the level of disclosure found in this study was low, and was also variable between companies and industries. Little evidence of increasing disclosure over time was found. However, there was some evidence of a higher level of disclosure by larger companies. No relationship was found between profitability and disclosure.

In another study in the United States of America, the FASB (2001) researched voluntary disclosures (not just intellectual capital) in 62 United States of America companies, and found a generally low but uneven pattern in quality and quantity, with the highest disclosure level occurring in pharmaceutical research and development companies.

Using a method that resembled that used by Guthrie & Petty (2000), Beaulieu, Williams & Wright (2002) researched the disclosure of intellectual capital in the annual reports of Swedish companies. A sample of 30 company annual reports was searched for the use of 53 selected intellectual capital concepts in sentences. The results indicated a variable but overall low level of intellectual capital disclosure, in spite of the well-publicised initiatives in intellectual capital by Swedish companies such as Skandia (Mouritsen, Larsen & Bukh 2001). Like Abdolmohammadi (2005), they found larger companies disclosed more, but that profitability and intellectual capital disclosure were unrelated.

Research into annual report disclosures using different methodologies has taken place in the United Kingdom. Beattie, McInnes & Fearnley (2004) found mixed results in a very detailed content analysis of the management discussion and analysis contained in a sample of 11 United Kingdom food company reports. While they were also looking for governance related

disclosures, they concluded that a low level of information was disclosed in the reports on intangibles, outlook information, employee or customer satisfaction, and innovation.

In a comparison between companies in Scandinavia and the United Kingdom, Roslender & Fincham (2004) found, in an interview study of a sample of six United Kingdom companies, "that intellectual capital is neither systematically nor strongly embedded within any of this sample of companies" (p. 203). They compared the prevailing political climates of Sweden and the United Kingdom, and suggested the lower interest in intellectual capital among the United Kingdom companies surveyed may be related to the higher emphasis on a competitive market and freedom of individual choice in the United Kingdom as compared to the social welfare culture in Sweden. In reaching this conclusion they focused only on the human component of intellectual capital, which may explain the contrary patterns of high success in the use of a more broadly defined concept of intellectual capital among companies such as Microsoft in the highly competitive American economy.

The disclosure research methodologies used in these studies have their origins in the earlier static perspective of intangible assets. Their strength lies in testing the presence or absence of intangible asset disclosure within the context of the chosen taxonomy and definitions, and as such has been useful in detecting the early stages of the adoption of intangible asset reporting. The more recent emphasis on the strategic use of intangible assets to create value – the dynamic perspective – has not been the focus of these studies. Some company annual reports, while not addressing intangible assets or intellectual capital explicitly, do disclose details of their value creation strategies. The Danish guidelines hold out an opportunity to incorporate this dynamic perspective into intangible asset disclosure research, and will be used in the empirical work that follows in this research.

Earlier disclosure studies have adopted varying approaches that have made meaningful inter-company, inter-temporal and international comparisons difficult. A consistently used disclosure research methodology that facilitates such comparisons remains to be identified and generally adopted.

3.7 Forward-Looking Perspective

Regulators have traditionally been cautious about the inclusion of forward-looking comment in annual reports because of the risk that it lacked credibility without verification, and may be manipulated to mislead. Hope (2003) carried out an international study that found increased company disclosure improved the accuracy of forecasts done by analysts, especially in jurisdictions where accounting standards were more closely enforced. An application of the game theory of disclosure (Dye, 2001) has also developed in the literature, as the "cheap-talk" game theory (Stocken, 2000).

The Corporate Report by the United Kingdom Accounting Standards Steering Committee (ICEAW, 1975) recommended a statement of future prospects in 1975. Continuous disclosure is encouraged by the listing requirements of most stock exchanges, including in New Zealand, to facilitate performance forecasting. However, there are few formal guidelines, and companies are cautious about making more than generalised outlook statements, and in practice appear to emphasise a company's risk exposures more than its value creation activities. From the 1970s in the United States of America forward-looking comments were also encouraged with "safe harbor [sic]" provisions to reduce the litigation risk for managers. After the Jenkins Report (AICPA, 1994) encouraged more forward-looking content in company reporting, United States of America legislation was passed in 1995 to strengthen these provisions (Stocken, 2000).

In an Australian study (Kent & Ung, 2003), found that there was limited quantitative forward-looking disclosure in annual reports. Of the 117 companies in the sample 55% gave qualitative outlook comment, which the researchers noted tended to have a positive bias. On a 7 point rating scale, only one company gave a "good to excellent" outlook disclosure, and 32% gave a "fair to acceptable" disclosure; and 45% gave no outlook disclosure while 21% were rated "poor." Nielson (2004b) also found a low level of forward looking content in a sample of Danish companies.

New international accounting standards for management commentary in annual reports are under discussion. These standards are known as the operating and financial review in the United Kingdom, and management discussion and analysis in the United States of America respectively (Deloittes, 2005; Texeira, 2004). Discussion has included moving towards requiring more forward-looking outlook comment on future prospects from companies. Issues include the nature of the disclosure (e.g., detail, time periods), disclosure of commercially sensitive information, defining materiality, verifiability and the role of auditors, and protection from litigation.

One school of thought is that any obligation to provide forward-looking information should not encompass information that management does not possess (Beattie & Pratt, 2002). This argument against making predictions allows instead an explanation of current resources and strategies on which others can base their interpretations of future performance.

There may also be clashes between a move towards requiring an increased level of outlook disclosure and the shift that is taking place in some companies away from traditional detailed budgeting practices (Beyond Budgeting Round Table, 2005; Waal, 2005b).

While management's detailed outlook for future performance would no doubt be informative for investors, opening up the "black box" of a company's value creation strategy (Lev & Daum, 2004) to allow stakeholders to make their own informed outlook judgements, as advocated in the Danish intellectual capital guidelines, presents fewer practical difficulties; and is a less onerous step forward. The empirical work that follows explores voluntary progress in this direction among New Zealand public companies, within the context of principles-based regulation.

3.8 New Zealand Securities Commission Guidelines

Corporate disclosure is guided by mandatory requirements, but there is no limitation on additional voluntary disclosures in New Zealand. The New Zealand Securities Commission is the main regulatory source that drives voluntary disclosure in public company annual reports

in New Zealand. On 16 February 2004 the NZSC released its report on *Corporate Governance in New Zealand: Principles and Guidelines* (NZSC, 2004; Diplock, 2004). The principle it put forward on reporting and disclosure reads as follows:

> *The board should demand integrity both in financial reporting and in the timeliness and balance of disclosures on entity affairs.* (p. 21)

The Organisation for Economic Cooperation and Development (OECD) Principles of Corporate Governance revised in 2004 (OECD, 2004a) include the following disclosure guideline:

> *The corporate governance framework should ensure that timely and accurate disclosure is made on all material matters regarding the corporation, including the financial situation, performance, ownership, and governance of the company.* (p. 22)

The wording is different, but the similarities of meaning and intent are high. There is a little more detail in the OECD principle, but the NZSC goes on to support its principle with seven more specific guidelines. Six are about the steps seen to be necessary to achieve relatively clear and auditable compliance with the principle, especially in financial and governance effectiveness matters. They closely reflect the obligations of a company to comply with the law and generally accepted accounting principles. Guideline 4.2 is more open-ended, and addresses voluntary disclosure. It sets out the regulatory principle as follows:

> *Annual reports of all entities should, in addition to all information required by law, include sufficient meaningful information to enable investors and stakeholders to be well informed on the affairs of the entity.* (NZSC, 2004, p. 21)

This guideline suggests that compliance with information disclosure laws will not disclose "sufficient meaningful information"; but it leaves the interpretation of what additional disclosures are appropriate to be made independently by each reporting entity. It also makes it clear that the audience for annual reports includes other stakeholders as well as investors; but again it leaves the interpretation of who those stakeholders may be to the reporting entity.

The NZSC has chosen to adopt regulation by principle, in common with the International Financial Reporting Standards (IFRS) that are currently being adopted in New Zealand. Diplock (2005) summarised the reason for this decision as follows:

> *The significant risk with rules-based approaches is that directors and executives will see corporate governance as no more than a set of burdensome and costly compliance requirements. Ultimately, form will triumph over substance. The Commission seeks to achieve exactly the opposite - a boardroom culture where ideas for good corporate governance are embraced because they are seen as drivers for good financial performance and for success in the capital market.* (p. 6)

The United States of America has favoured a rules-based approach to both its corporate governance regulation and its accounting standards. The interest in the voluntary disclosure of intangible assets lies mainly in Europe, and discussion on the subject appears to have been set aside in the United States of America in the face of the current post-Enron emphasis on rules compliance.

However, the United States of America also plans to eventually adopt a principles approach, which United States of America commentators often term an "objectives-oriented" approach (Glassman, 2003). This prospect suggests a possible return to a greater level of debate on voluntary disclosure questions in the United States of America at some time in the future.

Guideline 4.2 specifies the annual report as the vehicle for disclosing "sufficient meaningful information". Those companies that use separate specialised reports to disclose non-financial matters, or use less formal means to communicate with some stakeholders, make additional disclosures beyond satisfying this guideline.

The NZSC has left the interpretation of the Guideline to the judgement of boards of directors. For boards, however, the issues to be resolved encompass a range of emerging and actively debated issues, including stakeholder theory, intellectual capital identification and measurement, triple bottom line and sustainability reporting, business responsibility and

ethics, corporate transparency, company valuation and the adequacy of generally accepted accounting principles as expressed in accounting standards. Events in recent years have stimulated a high level of debate on these issues, and on the broad question of corporate responsibility and accountability. A board of directors seeking to comply with the principles set down by the NZSC could be forgiven for being uncertain about exactly what it needs to do to meet the implied standards and expectations. The "safe" thing to do is to follow the crowd, while a few companies take the initiative and move into new aspects of disclosure. There is undoubtedly a market and technology driven trend towards greater transparency to meet stakeholder needs (Tapscott & Ticoll, 2003), and it holds out potential rewards for first movers (Bray, 2002).

3.9 Summary

The information disclosure practices of companies do not appear to be built on a theoretical justification, but on a combination of mandatory requirements and self-interest. In New Zealand the principles-based Guideline 4.2 of the NZSC's *Corporate Governance Principles* (NZSC, 2004) is expressed broadly enough to encompass and encourage the informal and voluntary disclosure of a company's use of intangible assets. Its effectiveness in doing so will be evaluated in the following empirical work.

Earlier intangible asset disclosure research has shown an overall low level of disclosure in company annual reports, implying a low level of corporate interest in intangible assets. However, the methodologies used have been heavily influenced by the earlier dominant paradigm that sees intangible assets as static resources to be measured in a balance sheet sense. They have mostly used a quantitative content analysis driven by a variety of taxonomies selected by the various researchers. As observed, the results are difficult to meaningfully interpret and compare with each other within a country, let alone internationally.

Following the emerging dynamic perception of intangible assets, the concept of a company as a value creation "black box" as seen by external observers has been suggested (Lev & Daum, 2004). For the capital markets to properly value companies, more forward-looking information is needed than is revealed in the financial statements based on historical transactions at cost that are produced for stewardship purposes. Even if a full performance forecast model is not disclosed, an explanation of the main value drivers and how a company's managers are dealing with them will facilitate better performance projections by investors.

The disclosure of intangible assets or intellectual capital as a dynamic construct has received little attention in the literature. A different disclosure research methodology is needed to address this perspective. The Danish intellectual statement guidelines discussed in this chapter put no pressure on companies to report within the variable terminology and taxonomy restrictions that characterise much of the content analysis disclosure research that has been done so far. Instead, these guidelines take a more holistic analysis of the narrative and non-financial performance measures disclosed in annual reports, to assess whether the intellectual capital flow is being reported. They encourage companies to disclose their dynamic use of knowledge resources to create value. As such, they reflect the emerging paradigm identified in Chapter Two. A disclosure research methodology based on the Danish guidelines is likely to be more revealing about the recognition and reporting of intellectual capital in annual reports than much of the disclosure research that has been reviewed in this Chapter Three. An empirical exploration of a disclosure research method based on the Danish guidelines follows in Chapter Four. Although the Danish guidelines propose a separate annual intellectual capital statement, the recommended content is similar to the non-financial performance disclosures observable in some annual reports from New Zealand registered companies.

The disclosure of a management's financial outlook projections is potentially another way to open the "black box" and reveal a company's future value creation capability with an informed management perspective. In practice, the literature shows that companies are

reluctant to do so, or prefer to do so selectively. There are litigation risks, competitive issues and other conflicts of interest to consider. Self interest and game theory issues also arise, and investors and financial analysts are reluctant to believe them if they do.

The empirical work that follows investigates what outlook disclosure is made by New Zealand public companies, in the expectation it will be at a low level and mostly qualitative as has been shown in other international research. The literature shows that the capital markets generally prefer to make their own judgements about a company's future performance, based on a sound understanding of its value creation strategy or business model, and within the context of the macroeconomic environment at the time, rather than to accept a company's performance forecasts.

4 Research Questions and Methodology

4.1 Introduction

The aim of the empirical phase of this research is to explore the emerging paradigm of intangible assets seen as knowledge resources being dynamically used to create corporate value. This is a relatively new aspect of empirical research into intangible assets, which until recently has been dominated by the static resource-based perspective. The construct "intangible assets" is addressed by two different methods that correspond to the former static and now emerging dynamic paradigms of the intangibles assets epistemology identified in the literature review. As noted in Chapter Two, the term "intellectual capital" is used in this study to refer to the static perspective while the term "knowledge resources" is used to refer to the dynamic perspective.

The first step, as a control experiment, is an empirical measurement of intellectual capital disclosure in annual reports based on the static resource-based perspective of intangible assets. One of the two more established intellectual capital disclosure measurement methods using content analysis (Bontis, 2003) is replicated on a sample of New Zealand listed companies.

At the centre of the empirical work that follows, however, is a fresh approach to disclosure research methodology that reflects the emerging dynamic perspective of the use of knowledge resources for value creation. The literature review has revealed the recent Danish intellectual capital statement guidelines, from which an appropriate research method has been derived for this study to measure the disclosure in annual reports of the use of knowledge resources for value creation. This specifically developed method uses a quantitative rating scale as a measuring instrument. A scale of criteria for each rating level is used to provide consistent assessments for each company. This method is intended to reveal a company's use of knowledge resources and its value creation strategy in a quantitative way that facilitates meaningful comparisons and the potentially useful and insightful investigation of causal

relationships and motivations. The empirical work that follows includes several such investigations.

The related forward-looking value creation outlook disclosure in annual reports is also investigated, using a similar quantitative rating scale method to that used to measure the disclosure of knowledge resource use.

4.2 Research Questions

Four main empirical research questions have been formulated from key issues that emerged from the literature review, to drive the empirical investigation in this research:

- *Question 1: Can a more accurate measurement for the disclosure of intangible assets be found, focussing on the use of intangible assets to create value, as a holistic, dynamic construct? Could such a measure be developed from the innovative Danish intellectual capital reporting guidelines?*
- *Question 2: Do New Zealand publicly listed companies voluntarily report on their capability and use of intangible assets as a value creation strategy?*
- *Question 3: What motivates a company to disclose its use of intangible assets to create value, and is there any relationship between the disclosure of intangible assets and value creation performance?*
- *Question 4: Taking the disclosure of value creation strategies the next step, what forward-looking performance outlook disclosures do New Zealand public companies provide in their annual reports?*

4.3 Research Philosophy

A positivist multi-method research approach is adopted. A positivistic framework is used for the quantitative collection and analysis of the data, but an interpretive social science data collection process is adopted to address the qualitative nature of the non-financial disclosures being investigated.

For the analysis and interpretation of the data, a constructivist search is undertaken for meaning and causal relationships in the findings. Links are then made back into the prior research presented in the literature review.

4.4 Research Hypotheses And Design

Ten hypotheses are formulated and tested in this research. They are presented in Table 4.1.

The design of the research to test these hypotheses can be broken into several steps that together seek to answer the research questions. By far the most significant of these steps is the main study to measure knowledge resource disclosure, and the related explorations of the patterns and motivations for disclosure policies.

First, a measurement of intellectual capital disclosure by listed New Zealand companies from a static perspective is carried out using the established content analysis method developed by Bontis (2003) and used in several subsequent studies as detailed in Chapter Three. This step acts as a control study to compare the findings from an established disclosure method with those of the new method emphasising knowledge resources that is adopted in this study (H1). As an interesting aside to this step, a small exercise is undertaken to investigate how effectively the Bontis (2003) method deals with structured intellectual capital reports as published by a small sample of international companies.

A pilot study is then undertaken into the measurement of knowledge resources disclosure by listed New Zealand companies to explore the feasibility of a research method based on the Danish reporting guidelines identified in the literature review. This study paves the way for the main study with a first trial of the new measurement method and initial insights into knowledge resources disclosure practices by New Zealand companies.

Based on the lessons learned from the pilot study, the main study of knowledge resources disclosure by New Zealand listed companies is then undertaken, using an updated and improved sample of 50 companies. A further refined quantitative rating scale measuring

instrument based on the Danish guidelines and other sources is specifically developed for this purpose (H2).

Patterns of disclosure in relation to endogenous and exogenous value creation, company size, cost of capital and tangible asset intensity are then explored using the quantitative measures of knowledge resource disclosure found in the prior step. (H3 – H7).

Company strategy in relation to the disclosure findings is explored with a model, in search of further insights into the motivations that underlie company disclosure policies (H8). A predictive model using multiple regression is then developed in a further search for an explanation for disclosure differences between companies (H9).

Finally, the use of knowledge resources for value creation is a forward-looking endeavour, so it is logical that the related company performance outlook disclosure practices should be explored (H10). A rating scale quantitative measurement instrument is developed for this purpose. The design and methods used for each of these research steps are further detailed in the sections that follow.

Table 4.1: Hypotheses Tested

H1: New Zealand public companies do not disclose their intellectual capital.
H2: New Zealand public companies do not disclose their use of knowledge resources.
H3: Intangible asset disclosure is not related to endogenous value creation.
H4: Intangible asset disclosure is not related to exogenous value creation.
H5: Intangible asset disclosure is not related to company size.
H6: Intangible asset disclosure is not related to cost of capital.
H7: Intangible asset disclosure is not related to tangible asset intensity.
H8: Intangible asset disclosure is not related to strategy.
H9: A company's intangibles asset disclosure policies cannot be predicted by company characteristics.
H10: New Zealand public companies do not disclose their forward-looking performance outlook.

4.5 Static Intellectual Capital Disclosure

4.5.1 Methodology

This first research step is a replication of a research methodology used in prior intellectual capital disclosure studies from a static perspective. The aim is to provide a control for comparison with the results of the more innovative main step that follows. A sample of the annual reports of 100 listed New Zealand public companies is analysed for their use of intellectual capital terminology as a proxy for intellectual capital disclosure.

Based on the literature review, the hypothesis tested is:

H1: New Zealand public companies do not disclose their intellectual capital.

4.5.2 Terminology Content Analysis

An empirical content analysis of intellectual capital disclosure was conducted using the word and phrase searching methodology adopted by Bontis (2003). This is a similar method to that used by Gray, Roos & Rastas (2004), Vergauwen & van Alem (2005) and Abdolmohammadi (2005). This method was adopted despite the shortcomings noted in Chapter Three, in that it only addresses intellectual capital from a static perspective. It was carried out to provide a control comparison with the methodology adopted in this study to measure the disclosure of the use of knowledge resources.

4.5.3 Sample

A sample of 100 New Zealand public company annual reports was searched for their use of selected intellectual capital words and phrases developed by Bontis (2003). This sample was primarily derived from the New Zealand Stock Exchange (NZSX) Top 50 list over 2004 and 2005. Some of the Top 50 reports for the two years were not yet published or not available in electronic form at the time of the study. This shortfall was mostly made up from the reports of other larger listed public companies that appeared in the Price Waterhouse Coopers list (PWC, 2005a). Although it is not a publicly listed company, the report of Christchurch International Airport Ltd. (which is owned by a local authority) was also included because

Price Waterhouse Coopers advised on the preparation of its annual report (PWC, 2005b), using the latest evolution of the ValueReporting™ Framework approach as described in DiPiazza & Eccles (2002). The 100 annual reports searched include 59 from 2004 and 41 from 2005, including the reports for both years from 27 companies. Report availability at the time of the study led to the dominance of 2004 reports. The sample included 12 companies listed on the NZSX that were later identified as multi-listed foreign companies, and therefore not strictly New Zealand companies.

As a separate side study, a small sample of four international reports that included specific structured intellectual capital statements was also searched to gain some insight into how the Bontis (2003) method handled the measurement of intellectual capital disclosure in dedicated intellectual capital reports. These were: the Carl Bro and COWI 2004 annual reports that both used the Danish intellectual capital statement reporting guidelines (DMSTI, 2003a); the EES 2003 report (a United Kingdom company) that used the Intellectual Capital Index (Sveiby, 1997); and the Dow Chemical 2004 report, a United States of America company that was an intellectual capital pioneer (Stewart, 1997). For clarity, this small sample is referred to in Table 5.1, appearing in the following Chapter Five, as the "benchmark reports".

4.5.4 Terminology

The words and phrases selected by Bontis (2003) are shown in Table 5.1. The original list included two abbreviations – IC (intellectual capital) and KM (knowledge management) – in addition to the full terms. The abbreviations were dropped in the expectation that a formal annual report would spell out these technical terms in full at least once or use a glossary if such abbreviations were used. Following the practice partially adopted by Vergauwen & van Alem (2005), plurals were reduced to singular search terms, as they would be found whether the usage was singular or plural. In the one case where British and American spelling may have been an issue (i.e., the word "organisational" or "organizational"), both spellings were searched. In total, 36 distinct intellectual capital terms, each consisting of two words, were used.

4.5.5 Search Methodology

The search was carried out using the text search feature in Adobe Reader version 7.0.5 software, which is specifically intended for reading PDF documents. The search was conducted on digital PDF versions of the annual reports downloaded from each company's web site. This text search feature was first added in 2005 to version 7 of the Adobe Reader software, and identifies instances of the search term's usage in each reference document searched. With 36 terms over 100 reports, a total of 3,600 searches were undertaken. The outcome of these searches is a count of the occurrence of each of the listed terms in each of the annual reports in the sample.

4.6 Knowledge Resources Disclosure: Pilot Study

As a first step towards measuring knowledge resources from a dynamic perspective, a pilot survey was made of the 2004 annual reports of the NZSX Top 50 companies by market capitalisation as at July 2005. Each report was read and reviewed individually.

None of the reports contained a dedicated intellectual capital or knowledge resources statement. Only one of the reports attempted to value their company's intangible assets beyond the standard reporting of purchased intangible assets such as goodwill. This exception was ANZ Bank Ltd., which applied the formula used by Edvinsson & Malone (1997) to report its intangible asset value. The doubtful validity of this commonly used formula was discussed in Chapter Two.

The reports showed that some presented a knowledge narrative about the flow or use of knowledge resources in the company; details of the management challenges facing the company; the initiatives it was taking; and, non-financial performance measures comparable to the Danish intellectual capital statement guidelines (DMSTI, 2003a; Mouritsen, Bukh & Marr, 2004). Companies making these disclosures typically illustrated these issues with photographs and diagrams as aids in their communication, which was also consistent with the Danish guidelines, and the earlier precedent of the Skandia intellectual capital reports

(Mouritsen, Larsen & Bukh, 2001). The preliminary quantitative rating scale shown in Figure 4.1, derived from the Danish guidelines, was used to measure any knowledge resources disclosure content that was found in each sample company's annual report.

The disclosure is rated on a scale of 0 – 4 using the same categories as used in the SustainAbility methodology for assessing the triple bottom line disclosure content of annual reports (SustainAbility, 2004), with guidelines customised to the present context.

Figure 4.1: Pilot Study Knowledge Resources Disclosure Rating Scale

KNOWLEDGE RESOURCES REPORTING INDEX CRITERIA

Nothing = 0

No disclosure beyond compliance matters in the annual report of anything material related to the development of an intellectual capital asset or use of knowledge resources within the company.

Sketchy = 1

A generalised recognition of knowledge resources is apparent through commentary in the annual report, but the issue is not developed beyond a broad indication of the implementation strategy. Recognition implies at least an understanding of the use value of intellectual capital, in the sense of how intellectual capital could enhance the company's products or services for the benefit of the company's customers. The implementation strategy at minimum indicates a linkage between this use value and the development of the company's people, process and relationship resources.

Systematic = 2

A systematic descriptive coverage of the company's development of a knowledge resources, sufficient to indicate it is being addressed as an important management strategy issue, with specific evidence of actions and implementation progress achieved.

Some use in the annual report of illustrative examples, diagrams or pictures to convey the concepts and intent.

Clearly conveys a connection between the users' needs and how the company's know-how is being marshalled to add value in a coordinated way.

Extensive = 3

A description is given in the annual report of the management's commitment to a strategy of developing the company's knowledge resources to add value to its products and services as perceived by its customers. The customers' needs that are being addressed are clearly understood and the drivers of customer value are identified.

There is some quantification of the progress and specific achievements to date, with examples and illustrations to assist communication in the report.

A holistic company-wide approach linking customers, employees, business partners, technologies and business processes is apparent, not just isolated activities.

Integrated = 4

The concepts underlying knowledge resources are clearly integrated throughout the company and embedded in the management systems and processes. Evidence is given of the effective deployment of the concepts for implementation throughout the company as a core strategy for creating value for stakeholders, especially customers and shareholders.

Quantification and trend analysis give substance and comparability to show progress. There is some verification of relevant achievements in performance results, external survey results, awards, patents, or other recognition.

In the annual report there are tables, illustrations, photographs and explanations to persuasively document the company's commitment to building knowledge resources as value drivers.

Guidance Notes:

1. Intellectual capital terminology is irrelevant: content, understanding and intent count.
2. The structure of the approach is not being assessed: there are no reporting guidelines.
3. The interpretation must allow for each company's unique situation and context.

Over the 38 New Zealand companies in the pilot sample (i.e., excluding 12 foreign companies listed in the NZSX Top 50), the average rating on the scale was only 1.7, but 5 (13%) of the companies gained a high knowledge resources disclosure rating of 4.

While the pilot study showed there was a lack of formality about knowledge resources reporting in New Zealand companies, it also showed that a small group of these companies were reporting a significant understanding of the role of knowledge resources in value creation, and that they were actively engaged in applying this understanding. This knowledge resources disclosure found in the pilot survey was of a dynamic rather than static nature, which was consistent with the evolution of the paradigm found in the literature review, and with developments in the Danish disclosure guidelines (DMSTI, 2003a) and the European Meritum (2002) study.

This pilot study showed that a rating scale measure of knowledge resources disclosure based the Danish guidelines was relevant and promising as a method for assessing disclosure by New Zealand public companies, and that it was worth refining the approach.

In the course of the pilot study a preliminary assessment was made of the feasibility of applying several potential value creation measures using disclosed financial information. While some difficulties were identified with making detailed adjustments to economic value added calculations largely due to insufficient published detail, for the level of accuracy required this was not foreseen as a serious problem. Only one company was found to report in an unusual manner that would make comparisons difficult. For this, and other reasons referred to in the discussion of the final sample selection below, this company was eventually omitted from the main analysis.

4.7 Knowledge Resources Disclosure: Main Study

4.7.1 Methodology

This empirical study is based on the use of a disclosure measurement instrument derived from the Danish Government's intellectual capital statement guidelines. Unlike the static intellectual capital basis of the prior intellectual capital disclosure studies reviewed in the literature, this instrument's novelty is its design to measure knowledge resources disclosure in a dynamic sense. As such, it follows the emerging paradigm that intangible assets are not so

much assets in an accounting balance sheet sense than knowledge resources to be used holistically to create value. The instrument is a quantitative rating scale based on descriptive criteria. A sample of the annual reports of 50 listed New Zealand public companies was analysed using this instrument.

The study is carried out with a more detailed instrument than that used in the pilot study, extended to include separate rating scales for each of the four categories used in the Danish guidelines (see section 4.7.3 for more detail on the instrument developed). The results found are descriptive, but are expressed quantitatively in a manner that facilitates comparison and analysis.

The hypothesis tested is:

H2: New Zealand public companies do not disclose their use of knowledge resources.

4.7.2 Sample of Companies

For this study, a fresh sample of 50 company annual reports was taken from the 182 public companies listed on the NZSX in October 2005. During the pilot study 12 foreign companies were found in the July 2005 NZSX Top 50. To focus the findings on New Zealand companies the ten foreign companies found in the updated October 2005 NZSX Top 50 list were removed from the sample as they would not be representative of New Zealand disclosure practices, and because only a minority part of their share trading would take place in the New Zealand market. Three recently listed companies were also removed as they did not yet have a market and reporting history.

These 13 companies were replaced with a random sample of 13 other listed companies from the Price Waterhouse Coopers Cost of Capital Report of 31 March 2005 (PWC, 2005a). This list of 72 companies includes most of the NZSX Top 50 companies and a selection of other leading New Zealand public companies. From this list, four foreign owned companies, and seven companies that were no longer listed on the NZSX in October 2005, were deemed ineligible for selection.

Five of the randomly selected replacement companies were then also removed and replaced with others. Two were small companies that did not publish an electronic form of their annual report on the internet. The third, Infratil, was an investment company that did not report with standard consolidated accounts comparable to the other companies, and had a material overlapping ownership interest in one of the other companies in the sample, Trustpower. The other two companies removed were experiencing significant and unique trading difficulties that were likely to distort comparisons with other companies. From its volatile trading history, one of these companies had a very high equity beta of 2.52, which resulted in a weighted average cost of capital of 21.7%, over twice the average (10.3%) of the other companies assessed in the Price Waterhouse Coopers study. The reported operating losses of the last company removed were exceptionally high (27% of equity in 2005, following 20% in 2004) as it went through the process of selling down a large part of its local interests and investing heavily in an overseas business.

The latest available annual report on each sample company's web page on 20 October 2005 was used as the source of data. These reports included financial years ended 31 August 2004 through to 1 August 2005. Each annual report was downloaded from the respective company's web site as a PDF document to use as the primary source data for the research.

A list of the 50 sample companies is provided in Table 4.2. This Table presents the stock exchange codes (which is used to identify the companies in following tables), industry sector, financial year ended date, and market value (capitalised based on company share prices as at 30 September 2005). The industry sector designated reflects the dominant sector of activity of each company as used in the Price Waterhouse Coopers study. This sample amounts to 27.5% of the number of companies listed on the NZSX, and represents approximately 93% of the market capitalisation of listed New Zealand companies as at 30 September 2005.

Table 4.2: Sample Of 50 New Zealand Listed Companies (Alphabetical)

NZX CODE	COMPANY NAME	INDUSTRY	REPORT FYE	MARKET VALUE $M
ABA	ABANO HEALTHCARE GROUP LTD	FINANCE & OTHER	31-May-05	$48.40
AFF	AFFCO HOLDINGS LTD	PRIMARY	30-Sep-04	$232.52
AIA	AUCKLAND INTERNATIONAL AIRPORT LTD	PORTS	30-Jun-05	$2,778.63
AIR	AIR NEW ZEALAND LTD	TRANSPORT	30-Jun-05	$1,151.47
APT	AMP NZ OFFICE TRUST	PROPERTY	30-Jun-05	$461.55
BGR	BRISCOE GROUP LTD	CONSUMER	31-Jan-05	$297.01
CAH	CARTER HOLT HARVEY LTD	FORESTRY	31-Dec-04	$3,297.67
CAV	CAVALIER CORPORATION LTD	TEXTILE & APPAREL	30-Jun-05	$242.34
CDL	CDL HOTELS NZ LTD	LEISURE & TOURISM	31-Dec-04	$202.77
CEN	CONTACT ENERGY LTD	ENERGY	30-Jun-05	$4,382.42
CNZ	CAPITAL PROPERTIES NZ LTD	PROPERTY	31-Mar-05	$347.98
EBO	EBOS GROUP LTD	DURABLES	30-Jun-05	$132.45
FBU	FLETCHER BUILDING LTD	CONSTRUCTION	30-Jun-05	$3,694.37
FPA	FISHER & PAYKEL APPLIANCES HLDGS LTD	DURABLES	31-Mar-05	$929.23
FPH	FISHER & PAYKEL HEALTHCARE CORPN LTD	DURABLES	31-Mar-05	$1,894.42
HBY	HELLABY HOLDINGS LTD	INVESTMENT	30-Jun-05	$305.02
HED	HORIZON ENERGY LTD	ENERGY	31-Mar-05	$107.46
HLG	HALLENSTEIN GLASSON HOLDINGS LTD	CONSUMER	1-Aug-05	$295.50
KPT	KIWI INCOME PROPERTY TRUST	PROPERTY	31-Mar-05	$812.60
KRK	KIRKALDIE & STAINS LTD	CONSUMER	31-Aug-04	$26.50
LPC	LYTTELTON PORT COMPANY LTD	PORTS	30-Jun-05	$204.52
MET	METLIFECARE LTD	FINANCE & OTHER	31-Dec-04	$326.69
MFT	MAINFREIGHT LTD	TRANSPORT	31-Mar-05	$336.28
MHI	MICHAEL HILL INTERNATIONAL LTD	CONSUMER	30-Jun-05	$290.75
NOG	NEW ZEALAND OIL & GAS LTD	MINING	30-Jun-05	$209.48
NPX	NUPLEX INDUSTRIES LTD	CONSTRUCTION	30-Jun-05	$337.41
NTH	NORTHLAND PORT CORPORATION (NZ) LTD	PORTS	30-Jun-05	$139.12
NZR	THE NEW ZEALAND REFINING CO LTD	ENERGY	31-Dec-04	$1,464.00
PFI	PROPERTY FOR INDUSTRY LTD	PROPERTY	31-Dec-04	$230.71
PGG	PGG WRIGHTSON LTD	PRIMARY	30-Jun-05	$487.66
POD	POD LTD	TEXTILE & APPAREL	30-Sep-04	$41.80
POT	PORT OF TAURANGA LTD	PORTS	30-Jun-05	$600.18
PPL	PUMPKIN PATCH LTD	CONSUMER	31-Jul-05	$546.16
RBD	RESTAURANT BRANDS NZ LTD	CONSUMER	28-Feb-05	$135.88
RYM	RYMAN HEALTH LTD	FINANCE & OTHER	31-Mar-05	$493.00
SAN	SANFORD LTD	PRIMARY	30-Sep-04	$420.92
SCT	SCOTT TECHNOLOGY LTD	DURABLES	31-Aug-04	$62.91
SKC	SKY CITY ENTERTAINMENT LTD	LEISURE & TOURISM	30-Jun-05	$2,018.83
SPN	SOUTH PORT NZ LTD	PORTS	30-Jun-05	$30.43
STU	STEEL AND TUBE HOLDINGS LTD	CONSTRUCTION	30-Jun-05	$428.97
TEL	TELECOM	TELECOMMUNICATIONS	30-Jun-05	$11,792.33
TEN	TENON LTD	FORESTRY	30-Jun-05	$291.34
THL	TOURISM HOLDINGS LTD	LEISURE & TOURISM	30-Jun-05	$190.47
TPW	TRUSTPOWER LTD	ENERGY	31-Mar-05	$1,847.59
TRH	TOLL NZ LTD	TRANSPORT	30-Jun-05	$775.78
TTP	TRANS TASMAN PROPERTIES LTD	PROPERTY	31-Dec-04	$272.84
TUA	TURNERS AUCTIONS LTD	CONSUMER	31-Dec-04	$70.04
WAM	WASTE MANAGEMENT NZ LTD	FINANCE & OTHER	31-Dec-04	$612.14
WFD	WAKEFIELD HOSPITAL LTD	FINANCE & OTHER	31-Mar-05	$62.41
WHS	THE WAREHOUSE GROUP LTD	CONSUMER	31-Jul-05	$1,191.41

The share prices at 30 September 2005 were selected to eliminate market variations when making a cross section comparison between the companies, and to allow a lagged impact of disclosures on market value after the annual reports were released. While the same lagged period from the end of the release of the annual reports was desirable to facilitate inter-company comparisons on the impact of disclosures on market value, practical difficulties were encountered. Two thirds of the annual reports were for the financial year ended 31 March 2005 or later, and only 10% were for a financial year ended earlier than 31 December 2004. Moreover, the lag between the company's reporting date and the date the company released its annual report was not readily identifiable, and was variable between companies. While the listing rules of the NZSX require annual reports to be submitted within three months of the end of the financial year this has not always been complied with (NZSX, 2005b).

The company sizes ranged from a market value of $42M to $11,792M, with an average of $960M and a standard deviation of $1,842M. Telecom (TEL) is by far the largest company, at 2.7 times the size of the next largest company in the sample. The sample companies are grouped by industry sector in Table 4.3. Despite the wide-ranging industry representation, the sample reflects the lack of a significant presence of knowledge-intensive technology, pharmaceutical or consulting companies listed on the New Zealand share market.

Table 4.3: Sample of 50 New Zealand Listed Companies (by Industry Sector)

NZX CODE	COMPANY NAME	INDUSTRY	REPORT FYE	MARKET VALUE $M
FBU	FLETCHER BUILDING LTD	CONSTRUCTION	30-Jun-05	$3,694.37
NPX	NUPLEX INDUSTRIES LTD	CONSTRUCTION	30-Jun-05	$337.41
STU	STEEL AND TUBE HOLDINGS LTD	CONSTRUCTION	30-Jun-05	$428.97
BGR	BRISCOE GROUP LTD	CONSUMER	31-Jan-05	$297.01
HLG	HALLENSTEIN GLASSON HOLDINGS LTD	CONSUMER	1-Aug-05	$295.50
KRK	KIRKALDIE & STAINS LTD	CONSUMER	31-Aug-04	$26.50
MHI	MICHAEL HILL INTERNATIONAL LTD	CONSUMER	30-Jun-05	$290.75
PPL	PUMPKIN PATCH LTD	CONSUMER	31-Jul-05	$546.16
RBD	RESTAURANT BRANDS NZ LTD	CONSUMER	28-Feb-05	$135.88
TUA	TURNERS AUCTIONS LTD	CONSUMER	31-Dec-04	$70.04
WHS	THE WAREHOUSE GROUP LTD	CONSUMER	31-Jul-05	$1,191.41
EBO	EBOS GROUP LTD	DURABLES	30-Jun-05	$132.45
FPA	FISHER & PAYKEL APPLIANCES HLDGS LTD	DURABLES	31-Mar-05	$929.23
FPH	FISHER & PAYKEL HEALTHCARE CORPN LTD	DURABLES	31-Mar-05	$1,894.42
SCT	SCOTT TECHNOLOGY LTD	DURABLES	31-Aug-04	$62.91
CEN	CONTACT ENERGY LTD	ENERGY	30-Jun-05	$4,382.42
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NZR	THE NEW ZEALAND REFINING CO LTD	ENERGY	31-Dec-04	$1,464.00
TPW	TRUSTPOWER LTD	ENERGY	31-Mar-05	$1,847.59
ABA	ABANO HEALTHCARE GROUP LTD	FINANCE & OTHER	31-May-05	$48.40
MET	METLIFECARE LTD	FINANCE & OTHER	31-Dec-04	$326.69
RYM	RYMAN HEALTH LTD	FINANCE & OTHER	31-Mar-05	$493.00
WAM	WASTE MANAGEMENT NZ LTD	FINANCE & OTHER	31-Dec-04	$612.14
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HBY	HELLABY HOLDINGS LTD	INVESTMENT	30-Jun-05	$305.02
CDL	CDL HOTELS NZ LTD	LEISURE & TOURISM	31-Dec-04	$202.77
SKC	SKY CITY ENTERTAINMENT LTD	LEISURE & TOURISM	30-Jun-05	$2,018.83
THL	TOURISM HOLDINGS LTD	LEISURE & TOURISM	30-Jun-05	$190.47
NOG	NEW ZEALAND OIL & GAS LTD	MINING	30-Jun-05	$209.48
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SPN	SOUTH PORT NZ LTD	PORTS	30-Jun-05	$30.43
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SAN	SANFORD LTD	PRIMARY	30-Sep-04	$420.92
APT	AMP NZ OFFICE TRUST	PROPERTY	30-Jun-05	$461.55
CNZ	CAPITAL PROPERTIES NZ LTD	PROPERTY	31-Mar-05	$347.98
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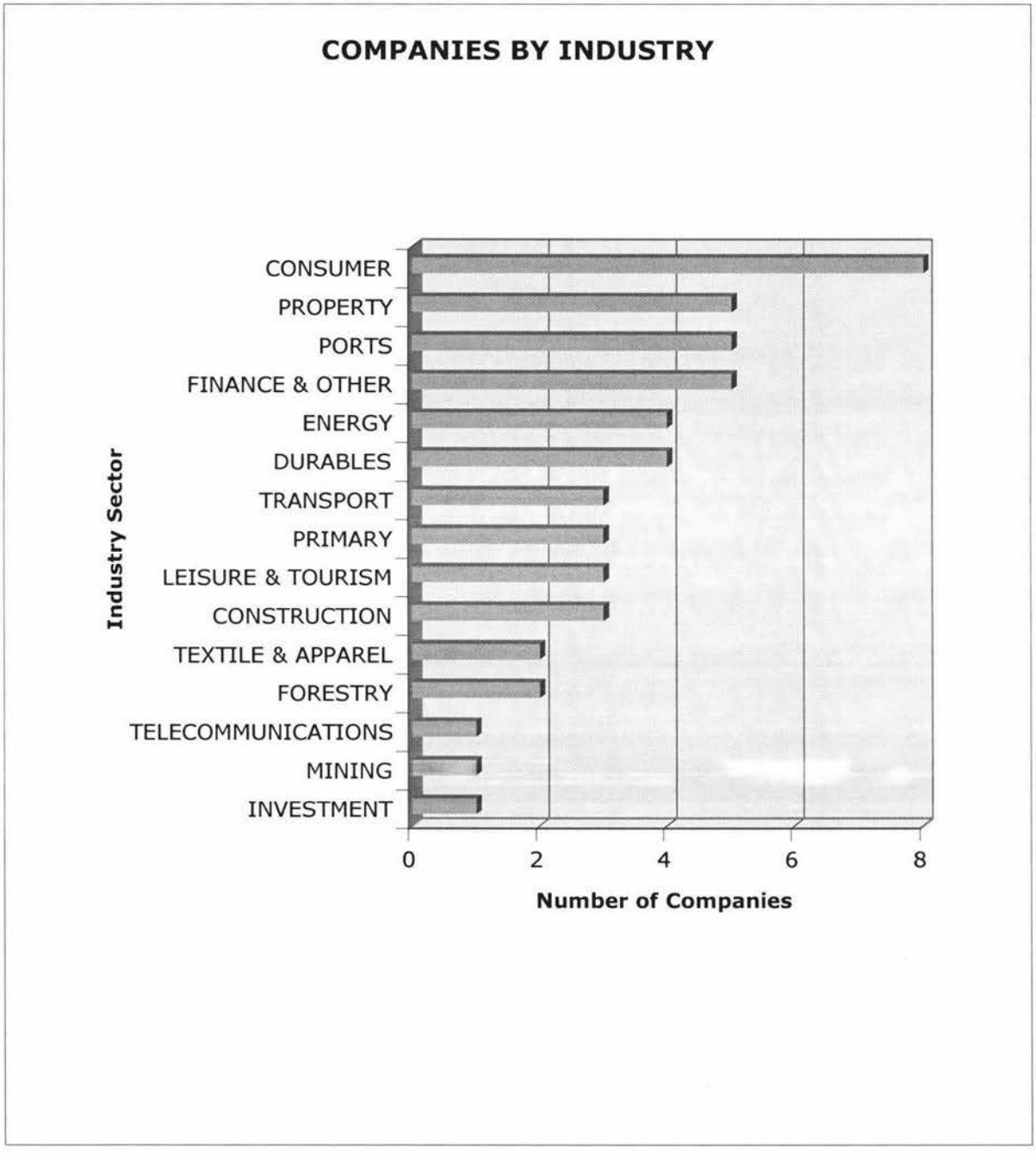
AIR	AIR NEW ZEALAND LTD	TRANSPORT	30-Jun-05	$1,151.47
MFT	MAINFREIGHT LTD	TRANSPORT	31-Mar-05	$336.28
TRH	TOLL NZ LTD	TRANSPORT	30-Jun-05	$775.78

Figure 4.2 shows the relative company numbers by industry in the sample. The distribution of the sample by industry is uneven. While this weakens the statistical usefulness of the sample for inter-company comparisons the sample is representative of the industry composition of the leading public companies in New Zealand.

Figure 4.2: Number of Companies by Industry Sector



4.7.3 Disclosure Measurement Instrument

An assessment of each annual report was made to determine whether there was a disclosure that conveyed the content described in the Danish intellectual capital statement guidelines

(DATI, 2001; DMSTI, 2003a; Mouritsen, Bukh & Marr, 2004). The guidelines are similar to those recommended by the European Meritum Project (Meritum, 2002).

Each annual report was read as whole to search for a holistic knowledge narrative, and to assess the degree to which it was backed up by supporting qualitative and quantitative performance measures. As the pilot survey had already established, there was very little disclosure of intellectual capital or knowledge resources content in the financial statement section of the reports. It was also often necessary to look beyond the signed board and management statements to the other commentary and division details in reports to find the main intellectual capital, knowledge resource use, strategy and non-financial disclosures in the reports.

The aim of the Danish intellectual capital statement is to report on the value creation potential of the company, its strategy for knowledge management and to identify its main value drivers. The four components of the statement are:

- Knowledge *narrative*, explaining the product or service and its value to its users, together with the company's supporting knowledge resources and competencies, and how the company intends to increase the value it provides to its users.
- *Challenges* facing the company's management to improve knowledge resources
- *Initiatives* being taken
- *Indicators* of performance

These statements may relate to the company as a whole or could be segmented by parts of the business.

Based on DMSTI (2003a), Mouritsen & Larsen (2005) suggested questions that could be asked to assess how well the four components of the statement are being addressed in an intellectual capital statement. These questions were used as the basis for developing a rating

criterion for each of the four components as set out in the worksheets in Figures 4.3 – 4.6 below.

A company's performance on each component is rated using the five level rating used by SustainAbility (2005): None (0), Sketchy (1), Systematic (2), Extensive (3) and Integrated (4). Guidelines were prepared drawing from DMSTI (2003a; 2003b; 2003c) to develop the rating instruments. Reference was also made to the content of the 2004 intellectual capital statements published by Danish firms COWI and Carl Bro as benchmarks, although their formal structure was not adopted.

Figures 4.3 – 4.6 set out the rating criteria used in the main study for each of the four components of knowledge resource disclosure. The outcome of the application of these rating scales to the 50 sampled annual reports was a schedule of four category ratings for each company, which were summed to give an aggregate rating, without making any judgement to weight the respective categories for their relative importance.

Figure 4.3: Knowledge Resources Disclosure Rating for Narrative

KNOWLEDGE RESOURCES DISCLOSURE: KNOWLEDGE NARRATIVE

Key Questions:

What product or service does the company provide?

How does it make a difference to the user?

What knowledge resources are necessary to be able to supply the product or service?

How does the constellation of knowledge resources produce the service/product?

None = 0

None of the questions are addressed.

Sketchy = 1

A background explanation only, explaining the company's products or services, but with only a sketchy coverage of customers and knowledge resources.

Systematic = 2

There is a systematic explanation linking the company's products and services to customer satisfaction and the role of knowledge resources in creating value: a rounded picture emerges from the explanation. What is done is clear.

Extensive = 3

Beyond level 2, there is a detailed explanation going from "what" to "how."

Integrated = 4

A clear and detailed link is made between the company's value creation strategy and customer satisfaction, explaining persuasively how value is created using knowledge resources. There is segmentation of this information.

Figure 4.4: Knowledge Resources Disclosure Rating for Challenges

KNOWLEDGE RESOURCES DISCLOSURE: MANAGEMENT CHALLENGES

Key Questions:

How are the knowledge resources related?

Which existing knowledge resources should be strengthened?

What new knowledge resources are needed?

None = 0

None of the questions are addressed.

Sketchy = 1

An outline of the challenges facing the company's management is given, and what knowledge resources are being applied.

Systematic = 2

A more comprehensive explanation of knowledge resource building is given, including how the company is identifying, strengthening and acquiring knowledge resources and meeting its identified challenges.

Extensive = 3

Detailed explanations of the challenges being addressed by management, how they are going about dealing with them including with sufficient knowledge resources.

Integrated = 4

A segmented breakdown is given of the challenges, and there is a persuasive explanation of how the company is going about applying sufficient knowledge resources to solve them.

Figure 4.5: Knowledge Resources Disclosure Rating for Initiatives

KNOWLEDGE RESOURCES DISCLOSURE: INITIATIVES

Key Questions:

What initiatives can be identified? Actual or potential ones?

What initiatives should be given priority?

None = 0

None of the questions are addressed.

Sketchy = 1

A general outline of initiatives to build and use intellectual capital to create value.

Systematic = 2

The company clearly recognises the role of intellectual capital in creating value and is actively taking one or more initiatives to develop and use this resource as part of its strategy.

Extensive = 3

Several knowledge resource development initiatives are disclosed, together with an explanation about how they fit in to the company's overall value creation strategy.

Integrated = 4

A clear identification of actual prioritised initiatives to compose, develop and procure knowledge resources, including human, structural and relationship intellectual capital, to create value.

Figure 4.6: Knowledge Resources Disclosure Rating for Indicators

KNOWLEDGE RESOURCES DISCLOSURE: INDICATORS

Key Questions:

Effects – how do activities work?

Activities – what does the firm do to upgrade knowledge resources?

Resource mix – what is the composition of knowledge resources?

None = 0

None of the questions are addressed.

Sketchy = 1

Some non-financial performance indicators of value creation are disclosed.

Systematic = 2

Non-financial performance indicators of value creation are disclosed and linked to the knowledge resources used.

Extensive = 3

A range of non-financial performance indicators of value creation, covering human, structural and relationship knowledge resources, are disclosed.

Integrated = 4

A portfolio of knowledge resources in use to create value can be identified in the non-financial performance indicators reported, and there are quantitative or qualitative indicators of how they are used, how they are developed and what effects they have on value creation.

4.8 Patterns of Disclosure

4.8.1 Methodology

The quantitative measurement of knowledge resources disclosure enables comparative analysis and other insights to be explored quantitatively. The emerging dynamic perspective of intangible assets as knowledge resources addresses their use to create value. Value creation can be approached from accounting, market-based and value added perspectives. In this study the accounting measure used is profitability. Tobin's "q", or the ratio of the market value of the company's securities over the replacement value of its assets, market value added and the market to capital ratio are the market-based measures used. Value added is defined as the residual economic rent that a company is generating on the resources it is using. In search of further insight, current economic value added is distinguished from future value added, as two separate measures.

Value can be perceived differently from the internal perspective of the company or from the external perspective of the markets and investors. The value creation measures used are therefore divided into endogenous and exogenous value measures for exploration, and to test the following hypotheses:

H3: Intangible asset disclosure is not related to endogenous value creation.

H4: Intangible asset disclosure is not related to exogenous value creation.

This study relates other measures of company characteristics to explore whether there are patterns that explain differences between companies in the amount of disclosure related to intangible assets made in annual reports. Company size and each company's cost of capital are characteristics that are related to voluntary disclosure in the literature, and are explored here. Tangible asset intensity and industry are then explored. The following hypotheses are tested:

H5: Intangible asset disclosure is not related to company size.

H6: Intangible asset disclosure is not related to cost of capital.

H7: Intangible asset disclosure is not related to tangible asset intensity.

The relationships between disclosure rating and company characteristics are measured using correlation and linear regression. Possible causal relationships that may be implied by these relationships are addressed in the discussion that follows the analysis.

4.8.2 Alternative Value Creation Measures

The central issue underlying the intangible assets discourse is their use to create value for a company. To relate intangible asset disclosure to value creation, a measure of company value creation is required. The following alternative approaches to value measurement were used:

- Accounting profit
- Market value added
- Tobin's "q"
- Market value to capital ratio
- Value added
- Current and future value added

Total shareholder returns was considered as another measure of value created, but it was found to require more detail of each company's capital structure changes and share market prices than was available from annual reports, and was subsequently not pursued.

4.8.3 Profitability

Net operating profit after tax (NOPAT) is the primary accounting measure used to measure the return to shareholders that a company earns. Adjustments to NOPAT are appropriate in some cases to ensure inter-company calculations are based only on earnings that may fairly be attributable to the company's use of knowledge resources to create value. The most common adjustment required is to remove abnormal gains and losses. For example, unrealised property revaluations are typically added to the NOPAT of property companies. In some cases changes in company structures result in a component of NOPAT earned from discontinued activities

that are no longer represented in the end of year balance sheet assets. The sale of parts of a business or material asset sales may result in the need to make adjustments for transactions that do not represent normal operating activity.

In some companies, part of the earnings is attributable to minority interests. While this adjustment is appropriate when comparing earnings to shareholder's equity, it may lead to an understatement when comparing returns on total assets.

Some annual reports clearly identify abnormal items to enable such adjustments. Other reports are more obscure, especially when they summarise and leave the details buried deeper within their financial statements and accompanying notes. Accordingly, recording NOPAT from company annual reports carries some risk that material abnormal earnings will not be identified in the data collection process and subtracted from NOPAT to normalise the data.

To facilitate comparisons between companies of different sizes, profitability is measured as a ratio of NOPAT over sales. This ratio is an indicator of the profit margin being earned. Free cash flow is another possible approach to measuring value creation, however it remains an historical approach and was not used in this research.

4.8.4 Market Value Added

NOPAT is an historical measure of value creation. But capital markets take a forward-looking view of expected future earnings when valuing a company's shares. A forward-looking perspective is preferred to reflect the usefulness of knowledge resources disclosures to the capital markets when arriving at market valuations for a company's securities. Market value added is a measure of the opinion of the capital markets as to whether a company is creating or destroying value: a positive value indicates value is being created and a negative value that it is being destroyed. The formula used (Young & O'Byrne, 2001, p. 29) to measure market value added (*MVA*) is:

MVA = market value – invested capital

$= M + D - E - L$

where:

M is the market value of equity,

D is the market value of debt securities,

E is the book value of shareholders' equity invested in the company, and

L is its liabilities at book value,

If D and L are measured at their book value, avoiding the effects of varying interest rates and the varying terms of debt securities, the measurement of MVA reduces to:

$MVA = M - E$

If MVA is positive, the market value of shares and debt exceed the amount of capital invested, the market expects a positive return on its investment. However, this measure does not take into account the risk free rate of return that capital could earn if invested elsewhere, and whether the company's value creation is sufficient to earn a risk premium. It is also a static measure that does not take account of different company's dividend policies (Young & O'Byrne, 2001).

4.8.5 Tobin's "q" Ratio

The Tobin's "q" ratio (Tobin & Brainard, 1968; Tobin, 1969) is a ratio of the market value of a company's securities over the replacement value of its assets, and provides an indication of whether or not additional investment will add value to a company in excess of its cost. A value of $q > 1$ will act as an incentive for a company to invest, and vice versa. Therefore, a value of $q > 1$ indicates that a company is benefiting from monopoly rents by being able to earn greater than the competitive market rate of return on investment. Conversely a value of $q < 1$ would indicate a company is unable to earn a sufficient rate of return on investment to justify replacing its assets as they wear out.

Lindenburg & Ross (1981) described detailed procedures for calculating Tobin's "q" correctly, though they pointed out the considerable practical data collection difficulties that are required to be more precise. In their calculation the market value of securities includes the market value of a company's debt as well as its shares, which reflects the total funding arrangements by a company, and neutralises differences in the mix of the sources of funding (see Modigliani & Millar, 1958) when comparing companies. Measurement problems include fluctuating share values and interest rates, and the age structure and yields of the mix of debt instruments a company may use. Estimating fixed asset replacement costs introduces price and technology changes over time, while estimating inventory values introduces price fluctuation and timing issues. Long before the intellectual capital measurement debate of the 1990s, Lindenberg & Ross (1981, p. 17) noted that intangible investments such as advertising, research, development and training costs, while expensed in accounting practice, were arguably investments in assets. Their omission leads to an upward bias in the measurement of Tobin's "q".

A simplified method of calculating "q" is adopted for this study. Derived from Lindenberg & Ross (1981) but taking into account the limited availability of data and the low benefits to be gained from incurring the costs of additional detailed refinements:

$q = (M + L) / (A + D)$

where:

M is the market value of equity,

L is liabilities, measured for simplicity at book value,

A is the book value of assets, and

D is the accumulated depreciation, which is added back to the asset book value as a coarse but pragmatic estimate of a replacement cost adjustment.

Tobin's "q" is similar to the market value added measure, and shares its weaknesses of not revealing either the ability of a company to earn a premium over the risk free cost of capital or its dividend policy.

4.8.6 Market Value to Capital Ratio

An alternative more commonly used and similar measure to Tobin's "q", is the ratio of market value over net assets or equity capital (Walsh, p. 172):

$M/(A-L) = M/E$

where:

M is the market value of equity,

A is the book value of assets,

L is liabilities, measured for simplicity at book value, and

E is the book value of shareholders' equity capital.

This ratio is an indicator of the premium shareholders are prepared to place on a company's shares as a going concern over the company's liquidation value after selling off its assets and paying off its debts.

Once again, the company's risk free cost of capital and its dividend policy are not taken into account.

4.8.7 Value Added

Economic profit (also known as economic value added or residual value) is a measure of value creation being achieved by a company relative to the capital that is employed. This measure assesses company earnings in excess of the cost of the capital invested in the company. In simplistic terms, the added value created by the company over and above what the company's net assets could have earned in a risk free interest bearing deposit.

The formula used (based on Young & O'Byrne, 2001, p. 54) is:

$VA = NOPAT + I - I \times (1-T) - (A \times WACC)$

where:

VA is the value added,

NOPAT is the net operating profit after tax,

I is the interest expense,

I x (1-T) is the tax shelter obtained from the interest paid,

T is the company's tax rate, and

A is the company's assets

WACC is the weighted average cost of capital

For this study, NOPAT is adjusted to exclude abnormal items and earnings from discontinued activities. Assets are measured as the end of year value rather than taking the average for the year. This approach avoids the difficulties of making inter-company comparisons that would result from a material change in activity through the year, such as the major disinvestment that took place part way through the year in the case of Tenon (TEN).

The weighted average cost of capital is estimated by the following formula (Lally, 2004; Price Waterhouse Coopers, 2005; Koller, Goedhart & Wessels, 2005):

$$WACC = I_d \times (1 - T_c) \times (D/(D + E)) + C_e \times (E/(D + E))$$

where:

WACC is the company's weighted average cost of capital,

I_d *is the rate of interest on debt,*

T_c *is the company's tax rat,*

C_e *is the cost of equity,*

D is the company's debt, and

E is the shareholders' equity.

And

$$C_e = (I_f \times (1 - T_i) + \beta \times (R_m - D_m \times T_m - I_f \times (1 - T_i))$$

where:

T_i *is the investors' average tax rate (income and capital gains,*

β *is the equity's beta, or sensitivity to the market,*

I_f *is the risk free rate of return,*

R_m *is the market risk premium,*

D_m *dividend yield, and*

T_m *tax on dividend.*

For this study the *WACC* for each company is taken from the March 2005 estimation made for each company by Price Waterhouse Coopers (2005). In the case of recently listed Pumpkin Patch (PPL) not evaluated by Price Waterhouse Coopers, the WACC of similar international retail company Michael Hill (MHI) was used as a proxy.

Value added calculated in this way corrects for the omitted issues of the cost of capital and dividend payments in the market value added and Tobin's "q" calculations. However, this approach to value added has the disadvantage of focusing only on current performance, which may not be representative of long-term performance. It is an endogenous measure, and does it take into account the exogenous capital market's perception of the company's expected future performance. Future value added can be used to bridge this gap.

4.8.8 Future Value Added

The value assigned to a company's shares by the market reflects the discounted present value of expected future earnings as well as current earnings performance. To estimate this future value component, the current operating value can be deducted from the market value. In turn the current operating value is estimated by adding the company's net assets to an estimate of the capitalised value of the current value added. This approach defines future value added as the increase or decrease from the current value added performance continuing unchanged into the future. It implies the market has assessed the net present value of both future earnings and any investments in capacity that may be necessary to realise this growth.

To estimate the future value the following calculations are followed (Young & O'Byrne, 2001, p. 36):

$$MV = CV + FVA$$

$$= IC + CVA + FVA$$

$$= IC + CVA/WACC + FVA$$

FVA = MV – IC – CVA/WACC

where:

MV is the market value of securities, including equity and debt

CV is the current operations value

IC is invested capital including debt and equity

CVA is the capitalised value of the current value added assuming continuation

FVA is the capitalised value of expected future improvements to the current value added performance

WACC is the company's weighted average cost of capital

This approach assumes the present *CVA* performance will continue long term into the future to arrive at the excess value added attributed by the market to the future prospects of the company. *FVA* represents the net present value of future value creation.

4.8.9 Value Creation Data

The calculations used to determine the value added and future value added measures are presented in Table 4.4.

Table 4.4: Value Creation Calculations For The Sample of 50 New Zealand Companies

NZSX CODE	NOPAT $K	INTEREST $K	TAX SHIELD $K	WACC	ASSETS $K	VALUE ADDED $K	VA/ ASSETS	FUTURE VALUE $K	FV/MV
ABA	-38	2913	961	12.3%	87339	-8829	-10.11%	74534	154.01%
AFF	58074	3051	1007	9.9%	270644	33324	12.31%	-320358	-137.78%
AIA	105641	36085	11908	9.2%	1279944	12063	0.94%	2189962	78.81%
AIR	180000	-23000	-7590	12.1%	4092000	-330542	-8.08%	2342222	203.41%
APT	34458	23118	7629	7.3%	842091	-11526	-1.37%	136976	29.68%
BGR	18726	1	0	9.3%	132410	6413	4.84%	131951	44.43%
CAH	435000	41000	13530	11.0%	5631000	-156940	-2.79%	818399	24.82%
CAV	19525	2854	942	7.6%	147827	10202	6.90%	44190	18.24%
CDL	23184	5011	1654	11.0%	421104	-19780	-4.70%	33463	16.50%
CEN	184244	85153	28101	7.7%	4374253	-95521	-2.18%	2588334	59.06%
CNZ	18073	17072	5634	7.2%	561082	-10887	-1.94%	193417	55.58%
EBO	9746	2192	723	8.6%	119114	971	0.82%	39853	30.09%
FBU	330000	77000	25410	9.3%	3641000	42977	1.18%	1747253	47.30%
FPA	68561	6231	2056	7.6%	1449699	-37441	-2.58%	845814	91.02%
FPH	61405	1247	412	9.2%	230310	41052	17.82%	1256174	66.31%
HBY	20858	5806	1916	9.4%	244401	1774	0.73%	181701	59.57%
HED	7704	2062	680	7.6%	80674	2954	3.66%	20555	19.13%
HLG	19297	0	0	8.7%	74231	12839	17.30%	89714	30.36%
KPT	52652	14518	4791	7.0%	1261936	-25956	-2.06%	291021	35.81%
KRK	1096	1606	530	7.6%	41382	-973	-2.35%	17626	66.51%
LPC	11826	2729	901	7.7%	200546	-1788	-0.89%	90256	44.13%
MET	17471	1263	417	10.5%	277406	-10810	-3.90%	231637	70.91%
MFT	13520	4942	1631	10.9%	238931	-9212	-3.86%	274017	81.48%
MHI	16510	1567	517	7.6%	130421	7648	5.86%	124733	42.90%
NOG	-2566	0	0	10.7%	93910	-12614	-13.43%	236460	112.88%
NPX	29215	17863	5895	7.9%	863206	-27010	-3.13%	424374	125.78%
NTH	1074	309	102	7.7%	112707	-7397	-6.56%	125568	90.26%
NZR	97547	2068	682	8.2%	542250	54468	10.04%	421641	28.80%
PFI	12639	5191	1713	7.1%	272478	-3229	-1.19%	79757	34.57%
PGG	20399	5888	1943	7.5%	468823	-10818	-2.31%	480890	98.61%
POD	3701	1301	429	10.4%	48451	-466	-0.96%	15160	36.27%
POT	33654	13970	4610	6.9%	650346	-1860	-0.29%	199946	33.31%
PPL	24599	576	190	7.6%	111339	16523	14.84%	243472	44.58%
RBD	10722	2006	662	10.2%	105336	1322	1.25%	71848	52.88%
RYM	23525	1253	413	7.3%	243141	6615	2.72%	216625	43.94%
SAN	53870	580	191	7.8%	519401	13745	2.65%	-248512	-59.04%
SCT	3716	49	16	11.2%	21967	1289	5.87%	34252	54.45%
SKC	104007	81035	26742	8.3%	1504558	33422	2.22%	1423410	70.51%
SPN	1937	365	120	7.1%	31471	-53	-0.17%	7115	23.38%
STU	36062	2962	977	10.9%	215367	14572	6.77%	160590	37.44%
TEL	916000	320000	105600	13.4%	7421000	135986	1.83%	8342504	70.75%
TEN	18000	2000	660	14.7%	261000	-19027	-7.29%	234773	80.58%
THL	10553	5977	1972	11.9%	287577	-19664	-6.84%	188238	98.83%
TPW	73154	33455	11040	10.1%	1377421	-43551	-3.16%	1395997	75.56%
TRH	41409	19128	6312	12.1%	712048	-31933	-4.48%	734316	94.66%
TTP	27974	1113	367	8.2%	615626	-21762	-3.53%	155704	57.07%
TUA	7005	86	28	9.5%	36494	3596	9.85%	10238	14.62%
WAM	25609	3440	1135	10.2%	189302	8605	4.55%	474187	77.46%
WFD	2887	747	247	7.2%	47706	-47	-0.10%	32085	51.41%
WHS	38979	19623	6476	8.4%	870664	-21009	-2.41%	1089638	91.46%

4.8.10 Tangible Asset Intensity

The dominance of a company's investment in non-current tangible assets is measured as the ratio of tangible over total assets, expressed as a percentage. These percentages are presented in Table 4.5. Tangible assets are estimated as each company's non-current or long-term assets less their intangible assets (e.g., goodwill, patents, fish quota, licences) as reported in their statement of financial position. In the case of Trans Tasman Properties (TTP), a material value of property was recorded as a current asset because it was in the process of sale, and was re-categorised as a term asset to avoid an abnormal distortion.

Table 4.5: Percentage Tangible Asset Intensity For Sample of 50 New Zealand Companies

NZX CODE	Non-Current Assets $K	Intangible Assets $K	Total Assets $K	Tangible/ Total Assets
ABA	77487	19505	87339	66.39%
AFF	203242	537	270644	74.90%
AIA	1261633	0	1279944	98.57%
AIR	2460000	0	4092000	60.12%
APT	838678	0	842091	99.59%
BGR	35961	0	132410	27.16%
CAH	4041000	208000	5631000	68.07%
CAV	68147	2371	147827	44.50%
CDL	244484	4838	421104	56.91%
CEN	4079858	169635	4374253	89.39%
CNZ	553033	0	561082	98.57%
EBO	41875	19168	119114	19.06%
FBU	2150000	228000	3641000	52.79%
FPA	732875	194049	1449699	37.17%
FPH	102652	3797	230310	42.92%
HBY	98780	39856	244401	24.11%
HED	76840	0	80674	95.25%
HLG	27439	0	74231	36.96%
KPT	1222428	0	1261936	96.87%
KRK	30457	0	41382	73.60%
LPC	190111	14	200546	94.79%
MET	220199	0	277406	79.38%
MFT	118603	34970	238931	35.00%
MHI	26972	143	130421	20.57%
NOG	42392	0	93910	45.14%
NPX	390507	55291	863206	38.83%
NTH	108503	0	112707	96.27%
NZR	411451	0	542250	75.88%
PFI	271719	0	272478	99.72%
PGG	182853	67716	468823	24.56%
POD	18766	4724	48451	28.98%
POT	629641	0	650346	96.82%
PPL	39269	238	111339	35.06%
RBD	99639	30713	105336	65.43%
RYM	227997	0	243141	93.77%
SAN	422099	278162	519401	27.71%
SCT	10410	0	21967	47.39%
SKC	1386264	357402	1504558	68.38%
SPN	27033	0	31471	85.90%
STU	61393	16934	215367	20.64%
TEL	5738000	911000	7421000	65.05%
TEN	92000	12000	261000	30.65%
THL	253104	34955	287577	75.86%
TPW	1299553	42085	1377421	91.29%
TRH	609371	0	712048	85.58%
TTP	546532	0	615626	88.78%
TUA	13826	7	36494	37.87%
WAM	292767	107885	189302	97.67%
WFD	39864	2363	47706	78.61%
WHS	395427	0	870664	45.42%

4.9 Motivation for Knowledge Resource Disclosure

4.9.1 Methodology

Exploratory research was undertaken into the motivation for companies to make the intangible asset disclosures found. The development of a predictive model for intangible disclosure was evaluated, using disclosure as the dependent variable and potential explanatory variables as independent variables.

The hypotheses tested were:

H8: Intangible asset disclosure is not related to strategy.

H9: A company's intangibles asset disclosure policies cannot be predicted by company characteristics.

4.9.2 Strategy

The decision of a board of directors to voluntarily disclose value creation detail in their annual report is likely to be strategic. Some of the differences in disclosure observed between companies are likely to be explained by differences in strategy. The patterns of residuals in the relationship between value added and disclosure ratings were investigated to look for possible motivations for these different strategies. The value added characteristic was used as an indicator of the overall endogenous value creation strategy of a company.

4.9.3 Predictive Model

A multiple linear regression model was developed. The dependent variable used was the overall disclosure rating for each company. The independent variables were selected from the company characteristics investigated in the prior sections. A stepwise regression approach was adopted, adding independent variables to investigate their sequential impact on the explanatory power of the model.

4.10 Outlook Disclosure In Annual Reports

4.10.1 Methodology

The financial outlook statement content of the sampled companies is researched using a quantitative rating scale based on descriptive criteria that encompass both quantitative and qualitative outlook disclosure.

The hypothesis tested is:

H10: New Zealand public companies do not disclose their forward-looking performance outlook.

A visual search was made of each annual report to look for any forward-looking outlook content. During the pilot study referred to above, an assessment was made of where outlook comment was likely to be found. Any outlook comment was found to most commonly appears in either the board chairman's or the managing director's commentary, and rarely in both; but in a few cases there was also outlook commentary to be found in, for example, business segment reporting sections (e.g., Fletcher Building). Accordingly, the entirety of each of the 50 annual reports in the sample was manually searched for outlook content and rated according to the measurement scale.

The rating scale measurement instrument presented in Figure 4.7 was developed. As with the rating scales used in the main disclosure study referred to above, this scale uses the five step 0-4 rating categories used by SustainAbility (2004), with customised criteria developed for each level.

Based on the apparent low level of outlook disclosure found when reviewing annual reports during the pilot study, the criteria used for each of the rating scales was set to reflect an expectation there would generally be a low level of quantitative outlook disclosure, in order to reduce the risk that all companies would be grouped at the bottom of the scale. A company rated at the top end of this scale therefore does not necessarily imply a high degree of

openness in its outlook disclosure in an absolute sense; but it does indicate relatively more disclosure than lower rated companies.

Figure 4.7: Outlook Reporting Measurement Instrument

OUTLOOK REPORTING INDEX CRITERIA

Nothing = 0

No specific disclosures of the outlook for the company beyond its current performance: at best a general "steady as she goes" message.

Sketchy = 1

A generalised comment is given on the company's performance outlook, including a broad overview of risk exposures.

Systematic = 2

The issues determining future earnings, at least for the next year, are outlined but the following year's profit expectation is not specifically quantified in dollar terms. A direction of the expected movement up or down is given and there is some indication of the size of the change. Major earnings risk exposures are summarised in general terms.

Extensive = 3

The report includes a specific discussion of the management's expectations for the short-term future earnings of the company, including a quantified estimate of the profit for the next year, even if it has to be derived by the reader from an estimated percentage change. The main risk exposures are identified. From the discussion an investor can assess the likely earnings for the following year, but there is limited explanation to build confidence in the estimate, and medium term earnings prospects are given in general terms.

There may be some indication of future dividend payments.

Integrated = 4

The annual report contains an outlook of the management's short to medium term future performance expectations, building on past performance as an integrated part of the discussion. At least the next year's profitability is quantified in dollar terms, and justified with an explanation of the management's strategies and other drivers for any material changes projected. The outlook is presented with a credible, realistic and balanced case, and discussion addresses the main risk exposures and how the company's management intends to minimise them.

Future dividend payment policies or amounts are projected.

There is sufficient information presented for an investor to assess the likely next year's earnings by the company with reasonable confidence, and to gain some guidance of the longer-term prospects.

4.11 Method Limitations

The instrument used to measure knowledge resource use is based on the well-established Danish intellectual capital disclosure practice. However, it is experimental in its detailed

construction and application. It is used in the absence of any suitable instrument to address the emerging dynamic perspective of intangible assets being found in the literature.

To reduce the risk of bias, and to improve the reliability of the findings, the criteria for each subjectively assessed rating were set down in written descriptive rating scales. These structured criteria reduced the scope of the subjective judgement that was necessary.

This first use of the method was exploratory. A blind data collection technique, employing independent data collection personnel to apply the rating scales, was not possible in this case but would have been desirable to improve objectivity. To further reduce the risk of subjectivity in any future larger scale application of the method, it would also be appropriate to design controls to compare and standardise the consistency of the interpretations of the rating scale criteria made by multiple researchers.

The design of the rating scales makes it possible to replicate the survey on this or different company samples, although no such independent cross-checking was incorporated into this research to help verify there was reliability and objectivity in the data collection process.

Although the sample used in the main second stage disclosure study includes 27% of the New Zealand listed companies by number and 93% by market value, generalising the results internationally may be unreliable. The New Zealand listed public company population is very small, and the range of industries included is limited, especially by the low representation of "New Economy" knowledge-intensive technology, pharmaceutical and consulting industries. New Zealand has its own regulatory and standards jurisdiction, which are generally similar to the converging international approaches but unique in some respects. Several disclosure studies have used international samples of companies to broaden their scope and to help generalise their findings (e.g., Meek & Roberts, 1995; Hope, 2003; Francis, Kurhana & Pereira, 2005). The method used in this study has the potential to be useful for larger scale international studies of knowledge resources disclosure that allow greater generalisation of their findings.

5 Analysis And Discussion

5.1 Intellectual Capital Disclosure

5.1.1 Data and Analysis

The findings of the word search for the specified 36 intellectual capital terms (Bontis, 2003) are summarised in the following Table 5.1, showing the number of companies within the sample that made reference to each of the terms in at least one instance. Table 5.1 shows separate figures for company reports falling into each of 2004 and 2005, and the aggregate for the two years.

The independent benchmark reports column refers to the separate side study relating to a small sample of four overseas companies that included specific intellectual capital content in their reports. These companies are included to assess the effectiveness of the method for measuring explicit intellectual capital reporting.

Table 5.1: Frequency Search Terms Used By Sample of 100 New Zealand Companies

Indicator Phrase	Frequency Of References	Frequency 2004	Frequency 2005	Benchmark Reports (4)
business knowledge	0	0	0	0
company reputation	1	1	0	0
competitive intelligence	0	0	0	0
corporate learning	0	0	0	0
corporate university	0	0	0	0
cultural diversity	0	0	0	0
customer capital	0	0	0	1
customer knowledge	0	0	0	1
economic value added	8	3	5	0
employee expertise	0	0	0	0
employee know-how	0	0	0	0
employee knowledge	0	0	0	1
employee productivity	0	0	0	1
employee skill	0	0	0	0
employee value	1	1	0	0
expert network	0	0	0	0
expert team	0	0	0	0
human asset	0	0	0	0
human capital	1	1	0	1
human value	1	1	0	0
information system	32	21	11	1
intellectual assets	0	0	0	0
intellectual capital	1	0	1	2
intellectual material	0	0	0	0
intellectual property	13	9	4	0
intellectual resource	0	0	0	1
knowledge asset	0	0	0	0
knowledge management	1	1	0	0
knowledge sharing	0	0	0	2
knowledge stock	0	0	0	0
management quality	1	1	0	1
organisational culture	3	3	0	0
organisational learning	0	0	0	0
relational capital	0	0	0	0
structural capital	0	0	0	1
supplier knowledge	0	0	0	0
Total References	63	42	21	13
Sample size	100	59	41	4
References per company	0.63	0.71	0.51	3.25
Excluding IS, IP and EVA[1]	0.10	0.15	0.02	3

1: Excluding information system, intellectual property and economic value added.

Of the 100 sampled listed public company annual reports, 63% used at least one of these terms. However, this finding actually falls to only 10%, when the generic terms "information system", "intellectual property" and "economic value added" are excluded from the count. These three terms are often used in a context only indirectly related to the process of value

creation using intellectual capital. For example, Fletcher Building (FBU) uses the term "economic value added" in its annual report in the context of its executive compensation plan.

References can include multiple instances of the use of terminology, but only one use is counted per report. For example, Telecom (TEL) repeated the use of the term "intellectual capital" (the only reference made in New Zealand reports) three times in the human resource section of its report. This term was repeated 41 times in the Carl Bro intellectual capital statement. Such repetition may reflect interest and commitment, but it is not necessarily a valid measure of the quality of the disclosure, for it is equally valid as a measure of repetition and verbosity.

The differences found between 2004 and 2005 reports cannot be relied upon to indicate a trend to reduce disclosure because of a different composition of the samples, especially the inclusion only in the 2004 sample of the large foreign companies listed in the NZSX Top 50.

This finding of low levels of disclosure compares similarly with the other research that has been done by Bontis (2003), Vergauwen & van Alem (2005) and Abdolmohammadi (2005).

In the side study of the benchmark comparisons, the Danish companies Carl Bro and COWI, presenting specific intellectual capital statements following the Danish intellectual capital reporting guidelines, were more likely to use the selected terminology. But together they only used nine of the 36 phrases. Dow Chemical used two other phrases, making a total of 11 out of the 36 phrases, compared to 11 used by the 100 NZSX companies. The use of the Intangible Assets Monitor methodology adopted by EES in its intellectual capital report led to no references being found to the selected 36 terms. Similarly the proprietary ValueReporting™ Framework, which is claimed to include intellectual capital considerations, and which was used in the Christchurch Airport report, did not lead to the use of any of the 36 intellectual capital terms.

5.1.2 Intellectual Capital Content Discussion

The findings of this study support the hypothesis:

H1: New Zealand public companies do not disclose their intellectual capital.

That the method even revealed low levels of intellectual capital disclosure in the side study of benchmark reports specifically intended to serve this purpose particularly indicates a serious methodological weakness. The low level of overlap between the benchmark dedicated intellectual capital reports and the Bontis (2003) intellectual capital indicator terminology casts serious doubt on the usefulness of this measure of the construct intellectual capital disclosure. Bontis (2003) was surprised by the low level of disclosure found among Canadian companies because there had been active discussion and awareness on the subject within Canadian business. This research points to methodology as an explanation.

Practitioners may use a different terminology from the selection developed by Bontis with the help of intellectual capital researchers at a specialised conference. The selection of terms also has a slight cultural bias. For example, one search term is "corporate university" which did not reveal the presence of a "training academy" specifically mentioned in its annual report by one of the New Zealand companies, Mainfreight (MFT).

The word and phrase search detects the use of the specialised intellectual capital terminology. Abdolmohammadi (2005) developed a different set of terms to use in his research, but also found low levels of disclosure. The inclusion of terms that overlap with other annual report content, (especially information system, intellectual property, and economic value added) is imprecise. The methodology is subjective to the extent the terms used reflect the researcher's perceptions of what terminology practitioners should use when making intellectual capital disclosures.

The measurement construct used for the knowledge resources disclosure research in the main study that follows is not constrained in this way, and is therefore more likely to be effective at

detecting the use of the concepts of intellectual capital, irrespective of the terms used, to create value for a company.

This research indicates that this intellectual capital disclosure research methodology based on terminology search is not a precision measure of the construct intellectual capital, in either a static or dynamic sense.

Wong & Gardner (2005) applied the other commonly used disclosure methodology, the Guthrie & Petty (2000) sentence-based content analysis approach, to investigate intellectual capital disclosure in 60 New Zealand companies. They concluded there was a "relatively low level of voluntary IC [intellectual capital] disclosure" (p. 24) in New Zealand. The methodology measures the frequency of disclosure in 18 elements or attributes divided into three categories: human, structural and relational. They found, for example that 67% of companies disclosed customer content, 48% brands content and 12 % education content. This measurement of disclosure provides no overall index, and meaningful quantified inter-company, inter-temporal or international comparison is difficult. The studies made in several countries using this methodology make generalised comments about the low level of disclosure found, and share the difficulties making meaningful comparisons and interpretations of the data. In the New Zealand study the range of companies reporting on each element was between 5% and 67% (Wong & Gardner, 2005). For the Malaysian study it was between 10% and 100% (Goh & Lim, 2004), the Irish study between 0% and 45% (Brennan, 2001) and the Australian study between 5% and 95% (Guthrie & Petty, 2000). There is no unifying characteristic such as a value creation role that distinguishes intellectual capital disclosure from other comment (e.g., marketing comment on customers) on the 18 elements to ensure a precise measure of the intellectual capital construct with this methodology. Accordingly, it is very difficult to meaningfully compare the Wong & Gardner (2005) study with either of the two methodologies used in this study, just as it is difficult to compare its results with those of the other international studies done using its methodology.

Guthrie & Petty (2000) noticed that company managers appeared to understand the concepts of intellectual capital and their significance, even though there was a low level of disclosure in their annual reports. As reported in Chapter Three, other similar studies made comparable observations. The terminology difficulty found in this current study suggests the possibility researchers and practitioners have been looking at the intellectual capital disclosure question from different perspectives.

This control experiment verifies the low level of intellectual capital disclosure approached from a static perspective that has been found in prior studies using this and similar methods. It highlights both conceptual and methodology problems that are addressed in the main study discussed below, and emphasises the potentially greater usefulness and relevance of the disclosure measurement method that has been developed and used empirically in this study, as discussed in the following section.

5.2 Knowledge Resources Disclosure

5.2.1 Knowledge Resources Disclosure

The main study in this research applies the new method described in Chapter Four to measure knowledge resources disclosure from a dynamic perspective. The knowledge resources disclosure ratings found for each of the 50 sampled companies, by each of the four categories as well as the overall total, are shown in Table 5.2.

Table 5.2: Knowledge Resources Disclosure Ratings

NZX CODE	Narrative 0 - 4	Challenges 0 - 4	Initiatives 0 - 4	Indicators 0 - 4	OVERALL RATING
ABA	3	3	3	2	11
AFF	0	0	0	0	0
AIA	1	1	1	1	4
AIR	4	4	4	4	16
APT	0	0	0	0	0
BGR	0	1	1	0	2
CAH	1	1	0	0	2
CAV	1	1	0	0	2
CDL	1	1	1	1	4
CEN	1	1	1	1	4
CNZ	0	0	0	0	0
EBO	3	2	2	2	9
FBU	3	3	3.5	3.5	13
FPA	2	2	1.5	1	6.5
FPH	4	3.5	3.5	3	14
HBY	2.5	2	1	1	6.5
HED	0	0	0	0	0
HLG	1	0	0	0	1
KPT	3	3	2	2	10
KRK	1	1	0	0	2
LPC	2	2	2	2	8
MET	1	0	0	0	1
MFT	4	4	4	4	16
MHI	4	3	3	3	13
NOG	3	3	3	3	12
NPX	4	4	4	3.5	15.5
NTH	0	0	0	0	0
NZR	2	1	1	1	5
PFI	0	0	0	0	0
PGG	2	2	2	1	7
POD	3	3	3	2	11
POT	2	2.5	2.5	1	8
PPL	0	0	0	0	0
RBD	3	2.5	2.5	2	10
RYM	1	1	1	1	4
SAN	3	2	2	2	9
SCT	1	1	1	1	4
SKC	3	2	2.5	2	9.5
SPN	2	0	0	0	2
STU	2	1	1	1	5
TEL	4	3.5	3	3	13.5
TEN	1	1	1	0	3
THL	2	1	1	0	4
TPW	1	1	1	1	4
TRH	3	2.5	3	2	10.5
TTP	0	0	0	0	0
TUA	2	1.5	1	1	5.5
WAM	2	2	1	1	6
WFD	2	2	2	1	7
WHS	4	4	4	3	15
Mean	1.78	1.55	1.43	1.19	5.95
Std Dev	1.32	1.27	1.32	1.22	4.99

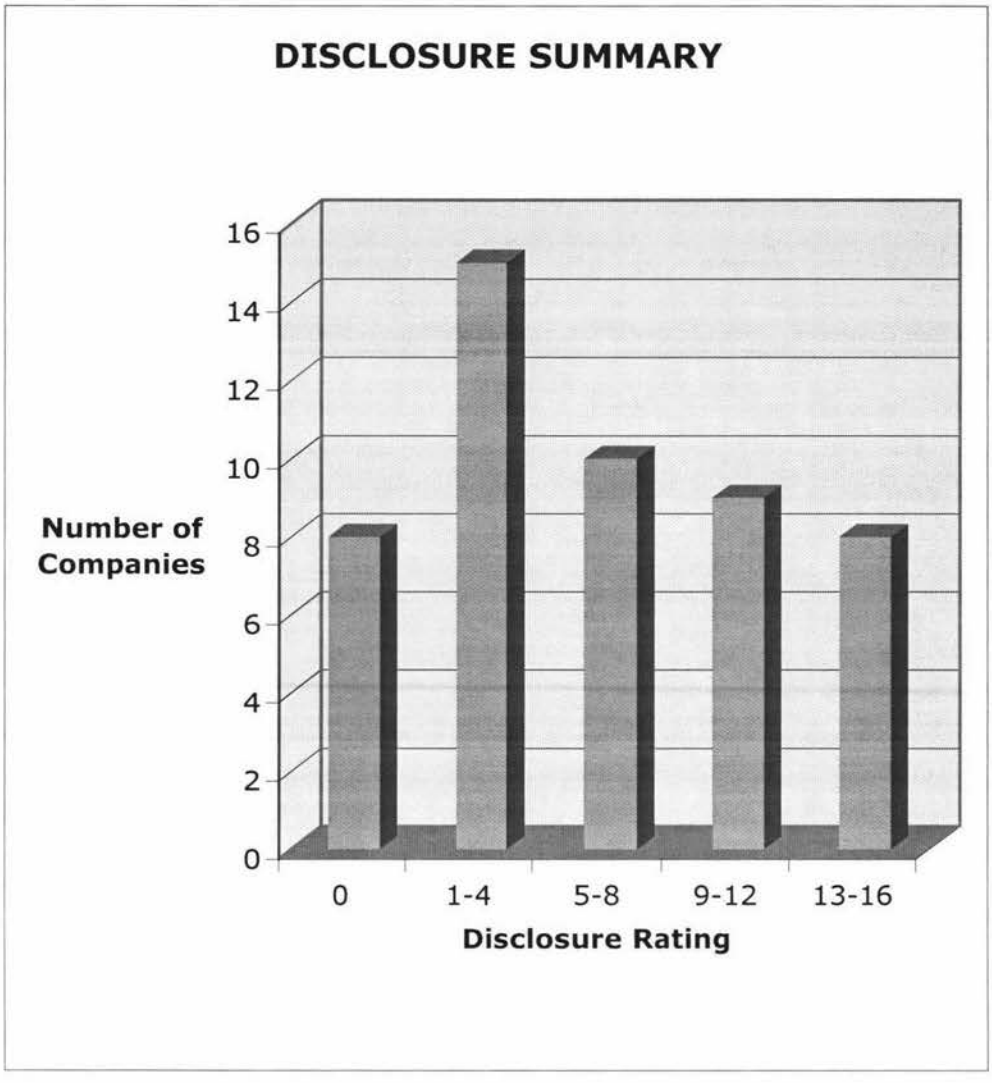
Out of a possible overall rating of 16, the mean rating assigned to the 50 companies was 5.95, with a standard deviation of 4.99. Eight (16%) of the sample companies were rated as making a high level (rating of 13-16) of knowledge resources disclosure. Companies in this group included Air New Zealand (AIR), Telecom (TEL) and The Warehouse (WHS) whose reports have received favourable mention for their disclosure by the New Zealand Securities Commission (Quinn, 2005). Telecom (TEL) and Michael Hill (MHI) from this group won the Chartered Accountants of New Zealand 2005 Annual Report Awards[3] (ICANZ, 2005) in the corporate categories. Although Sanford (SAN) won in the specialised environmental reporting category of these Awards, it fell about half way at nine on the disclosure rating scale of 0-16.

High rating reports did not follow any structured knowledge resources reporting guidelines, and nor did they use a material amount of the specialised terminology that is to be found in the knowledge resources discourse in the literature reviewed for this study. However, the knowledge resources content that was integrated into their reports met the criteria of the Danish intellectual capital reporting statement guidelines.

Nearly half of the sampled companies provided little or no knowledge resources disclosure: 8 (16%) were rated as providing no disclosure and 15 (30%) provided only a sketchy level of disclosure. The other 19 (38%) companies provided a moderate amount of disclosure, rated as systematic to extensive in its coverage. The following chart in Figure 5.1 illustrates these findings.

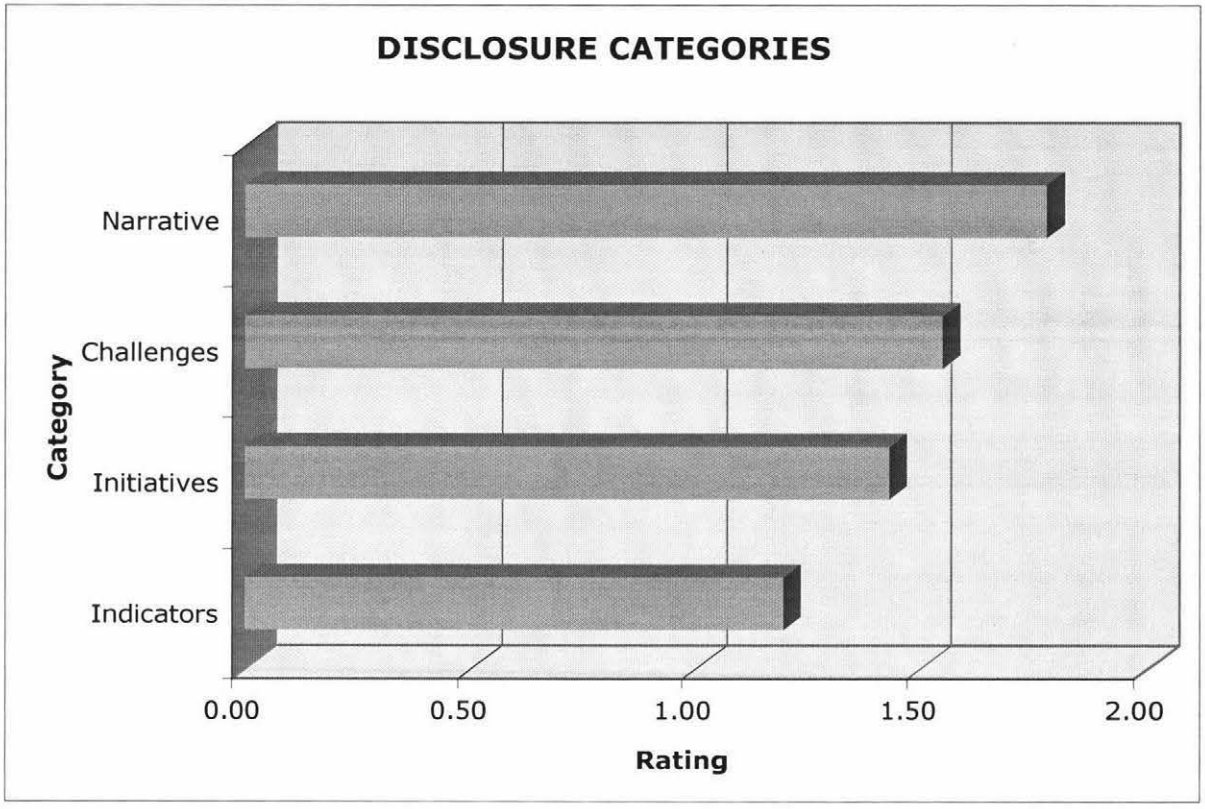
[3] Insufficient information is available to confirm whether the annual reports for the awards were for the same period as those in the disclosure sample.

Figure 5.1: Knowledge Resources Disclosure Ratings



The following chart in Figure 5.2 illustrates the breakdown of the average rating in each of the four categories that were assessed: narrative, challenges, initiatives and indicators. The average rating declines from the relatively broad level of the knowledge narrative through the increasingly specific challenges and initiatives to the detailed provision of indicators and illustrations of performance. This pattern reflects the evolution pattern that a company will follow as it provides an increasing level of knowledge resources reporting detail, and reflects a varied level of progress among the companies that have embarked down this path.

Figure 5.2: Knowledge Resources Disclosure by Category



5.2.2 Knowledge Resources Disclosure Discussion

The findings of this study do not support the hypothesis:

H2: New Zealand public companies do not disclose their use of knowledge resources.

Contrary to the concerns expressed in Guthrie & Petty (2000) that there is a gap between the understanding of intangible assets by managers and disclosure practices in annual reports, this study provides evidence that intangible assets are understood and disclosed to at least some degree by a majority (84%) of the New Zealand public companies sampled, and extensively by 16%. This different finding arises from a combination of the different method used, and the dynamic rather than static paradigm on which it is based.

These findings suggest that the instrument derived from the Danish intellectual capital statement guidelines gave a more accurate and precise measure of how companies disclose their use of intangible assets than the control study using the methodology developed by Bontis (2003). The instrument is able to measure varying levels of disclosure by companies on a comparative rating scale, and shows that only 16% of the sample companies made no

relevant disclosure. Usefully, it also indicated a gradation in disclosure through the four Danish guideline categories, which suggests an evolutionary process as companies choose to move from generalised narrative disclosure through to backing it up with indicators of performance.

Having established that this instrument gives access to useful data, further refinements could be added to improve its accuracy and precision, and to gain more insights, with reference to the Danish guidelines in DMSTI (2003a, 2003b, 2003c).

The Danish intellectual capital statement guidelines promote a specialised component or supplement to company annual reports. This study shows that the voluntary disclosure of the use of intangible assets is taking place within New Zealand companies, within the context of the reporting of other non-financial performance, business strategy and other commentary. It shows that the content of an intellectual statement can be meaningfully integrated within the commentary of an annual report. It also shows that such reporting can be independent of the terminology that is used within the academic discourse on intellectual capital.

This finding is a positive indicator for a trend towards compliance with the broader disclosure principles implied by Guideline 4.2 (New Zealand Securities Commission, 2004), although there are material differences between companies. The small group of companies with high ratings in this study are setting a standard as exemplars for others.

5.3 Patterns of Disclosure

5.3.1 Disclosure and Profitability

While the study by Abdolmohammadi (2005) showed no relationship between profitability and intellectual capital disclosure, this study does show a weak inverse relationship.

Profitability is measured from two different perspectives: NOPAT as a ratio over sales, which reflects margin, and value added as a ratio over equity capital, which reflects return on investment. The use of ratios eliminates company size differences in the comparisons. These

are endogenous measures of value creation that are independent of the perceptions of the value of the company by the capital markets.

Of the 50 companies in the sample, 28 (56%) had a negative value added result, indicating that they destroyed rather than created value. This reflects previous concerns expressed about management effectiveness in New Zealand. The poor performances of large corporates such as Air New Zealand, Brierley, Carter Holt Harvey and Fletcher have been criticised as corporate governance issues (Healy, 2003; Wilkinson, 2001); and the later intervention of the Government in troubled Air New Zealand (Lockhart, 2004) and Tranzrail raised further corporate governance questions. This finding also suggests the potential for the use of knowledge resources to add value has not yet been universally recognised in New Zealand.

For both measures of endogenous profitability there is an inverse relationship shown with knowledge resources disclosure: more profitable companies are likely to disclose a lower amount of information about their use of knowledge resources.

The introduction of sales in the NOPAT/Sales ratio encountered two data outlier problems. New Zealand Oil & Gas (NOG), an energy and mining company, switched to exploratory activity with low levels of sales activity in the sampled year. Kiwi Income Property's (KPT) ratio was abnormal because of large property transactions. These two companies were dropped from the sample to investigate the relationship between NOPAT/Sales and the disclosure rating. Doing so improved the correlation coefficient from 0.22 to 0.44.

The Pearson product moment correlation coefficient (r) is low for both measures of profitability, which reflects the wide dispersion of data around the linear least squares regression line in Figures 5.3 and 5.4. The correlations and their statistical significance are shown in Table 5.3.

Table 5.3: Profitability and Disclosure Correlation

	NOPAT/Sales	Value Added/Equity
Pearson Coefficient (r)	-0.44	-0.22
t ratio	3.3518	1.563
Significance (one tail) (p)	<.005	.10

Both correlations are statistically significant, but NOPAT/Sales has the stronger and more significant relationship with the disclosure rating.

The least squares regression line fitted to this data is as follows:

$$NOPAT/Sales = 0.010\ DR + 0.195$$

Standard error	*0.003*	*0.024*
t ratio	*-3.281*	*8.044*
Significance (p)	*.005*	*< .0005*

F = 10.763 Significance p = .01

Standard error of estimate 0.106

$R^2 = .190$

Both the coefficient for the independent variable and the intercept are statistically significant, as is the value of F, an indicator of the overall predictive power of the model. R^2, *the* coefficient of determination, shows that the regression model explains 19% of the relationship.

Figure 5.3: Disclosure and Profitability Margin

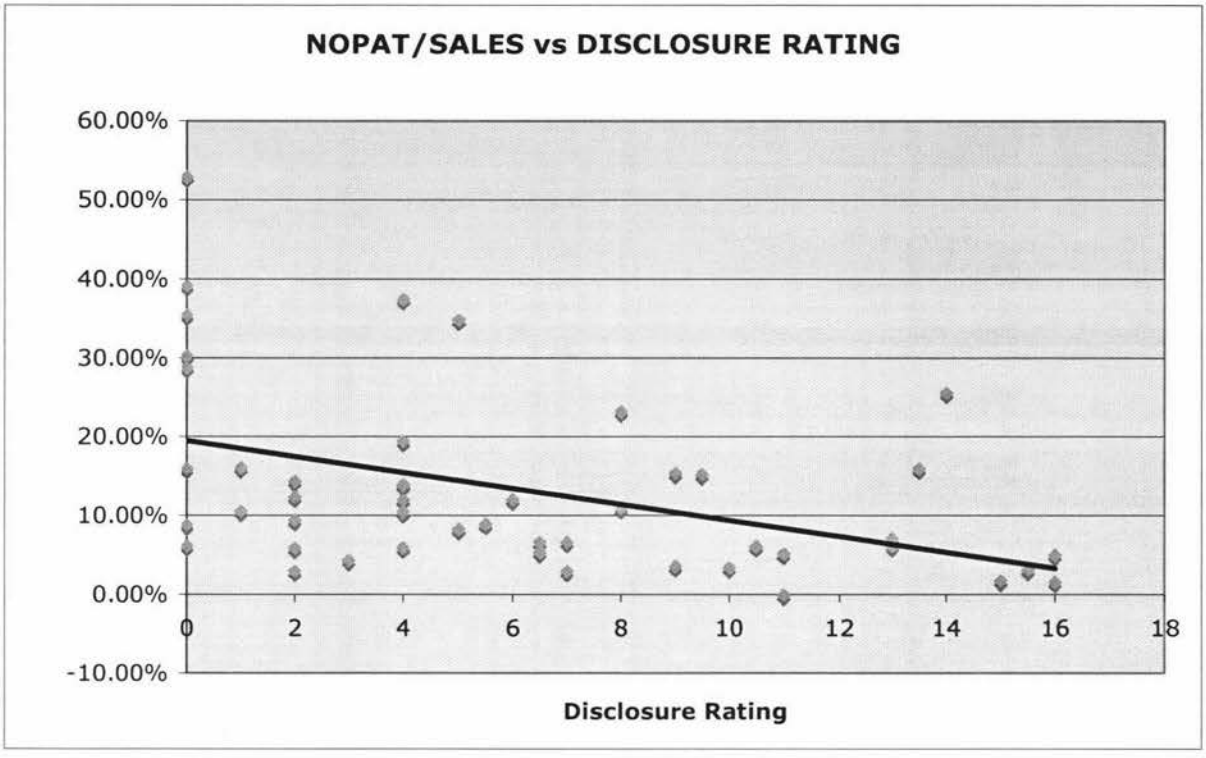
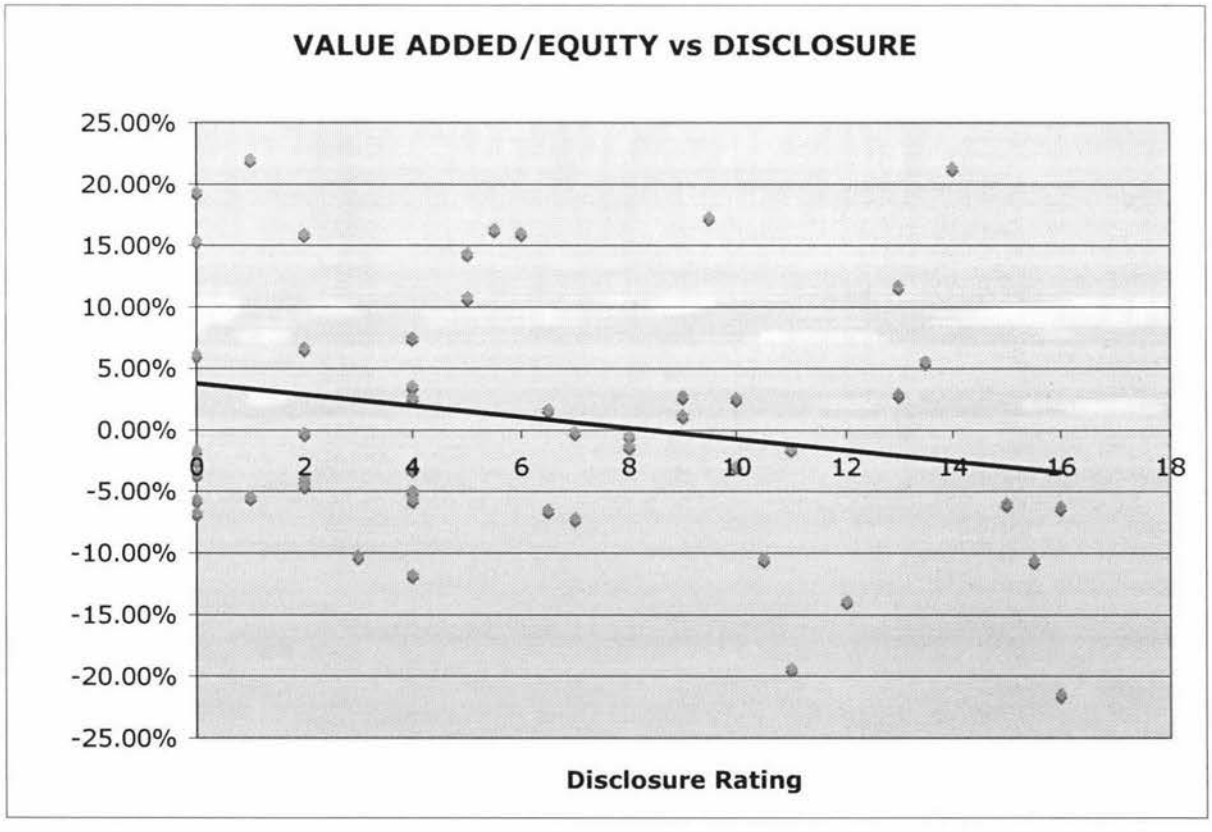


Figure 5.4: Disclosure and Profitability Return



Both measures of profitability show a declining disclosure rating with increased profitability.

This inverse relationship finding negates the hypothesis that there is a not a relationship between disclosure and profitability:

H3: Intangible asset disclosure is not related to endogenous value creation.

The inverse relationship found could indicate that companies making higher levels of disclosure are also investing more heavily in intangible assets (e.g., advertising, training or research), which are expenses under current accounting standards and act to depress current profitability. This hypothesis has not been investigated in this study because the level of expenditure detail required is not reliably and consistently available from breakdowns in externally published financial statements.

Alternative endogenous value creation relationships were explored without finding useful relationships. The correlation coefficient between NOPAT (without adjusting for company size) and disclosure was $r = 0.23$. Eliminating company size influences by correlating NOPAT/assets with disclosure yields a correlation coefficient of $r = 0.13$.

A correlation coefficient of $r = -0.09$ was found between value added (without adjusting for company size) and disclosure. A correlation coefficient of $r = -0.19$ was found after correcting for company size with the ratio value added/assets, and relating it to disclosure.

No relationship was found between the sales growth over the prior year and intangible asset disclosure ($r = -0.003$). Similarly value added momentum, the change between the current and prior year's value added performance, showed no relationship with disclosure ($r = 0.08$).

5.3.2 Exogenous Value Creation

The Pearson product moment correlation coefficients (r) in the range -1 to +1 were as presented in Table 5.4 for the exogenous value creation measures.

Table 5.4: Value Creation and Disclosure Correlation

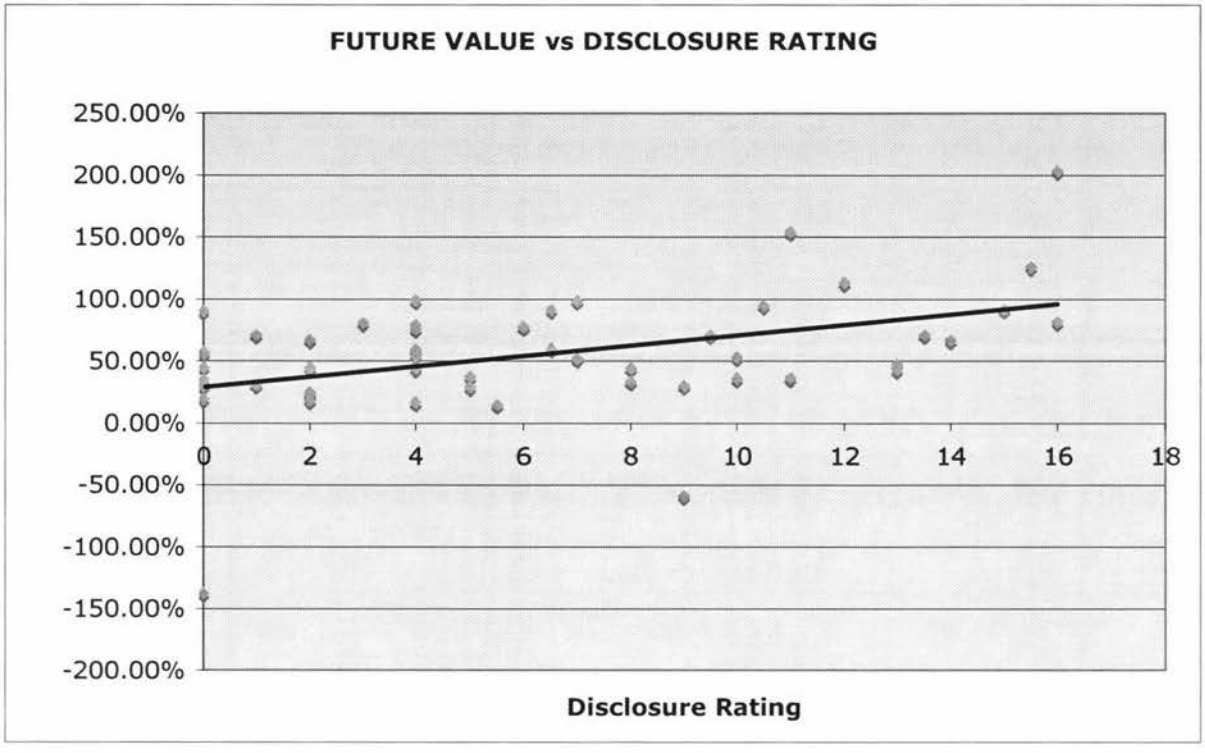
	Coefficient (r)	t ratio	Significance (p) (one tail)
Future value/market value	0.43	3.28	.005
Market value/equity capital	0.15	1.051	>0.1
Tobin's q	0.10	0.696	>0.1
Market value added/assets	0.08	0.556	>0.1
Market value/asset value	0.05	0.347	>0.1
Market value added/market value	0.02	0.139	>0.1

The relationship between disclosure and the future value/market value ratio is moderately significant. For the other five measures the statistical significance is very low. Only the future value calculation method measures value creation in excess of the cost of capital. The other measures only indicate whether there is positive or negative value creation, taking no account of risk free alternative investment options.

Market value added has a correlation coefficient of 0.24 with disclosure, but this is influenced by the positive relationship found between size of company and disclosure. This outcome is shown by the finding that the correlation coefficient between market value added and market value is a relatively high 0.89, and reveals the presence of collinearity in this relationship.

The moderate significance ($r = 0.43$) of the strongest value creation correlation found, that between future value/market value and the disclosure rating, is shown in the least squares regression line fitted to the following scatter graph in Figure 5.5.

Figure 5.5: Disclosure and Future Value



The least squares regression line fitted to this data is as follows:

Future Value/Market Value = 0.0418 DR + 0.291

Standard error	*0.017*	*0.135*
t ratio	*0.013*	*0.102*
Significance (p)	*.005*	*.005*

F = 10.789 Significance p = .01

Standard error of estimate 0.445

$R^2 = .184$

The values of the coefficients are statistically very significant, as is F, the measure of the overall predictive power of the model. The coefficient of determination, R^2, shows that 18.4% of the relationship is explained by the model. This finding of a positive relationship does not support the hypothesis:

H4: Intangible asset disclosure is not related to exogenous value creation.

The four companies that fall farthest from the least squares regression line as outliers are Affco (AFF) at a low disclosure rating of 0, Sanford (SAN) with a disclosure rating of 9,

Abano Healthcare (ABA) at 11 and Air New Zealand (AIR) with a high rating of 16. The annual report from Affco (AFF) showed a satisfactory profit performance in the current year, but strongly featured historical photographs and no material comment about how management was working today to create value for shareholders. In contrast, the Air New Zealand (AIR) annual report revealed a marginal current performance, but told a persuasive story of how effectively management was working to prepare the company to create value in the future. This difference is reflected in the relative future value added given to the companies by the capital markets. Coincidentally, Sanford's (SAN) report also prominently features a look back into the company's historical past. Although it does also address its strategies for value creation in its report much better than Affco (AFF), the company's disclosures are a modest effort compared to that of Air New Zealand (AIR), and the market has discounted the company's future value. Abano Healthcare (ABA) is likely to have gained its high future value from a major repositioning out of a low margin business segment to refocus on business segments with a higher potential for future profitability.

5.3.3 Disclosure and Size

The following graphs show there is evidence of an increased level of knowledge resources disclosure as the size of the company increases. This is consistent with the findings of other studies such as Beaulieu, Williams & Wright (2001) and Abdolmohammadi (2005). Size of company is measured in two ways, using each company's market capitalisation and its total assets. The logarithms of the size variables are used to enable the dispersion to be more clearly viewed when plotted in Figures 5.6 and 5.7.

Figure 5.6: Disclosure and Market Value

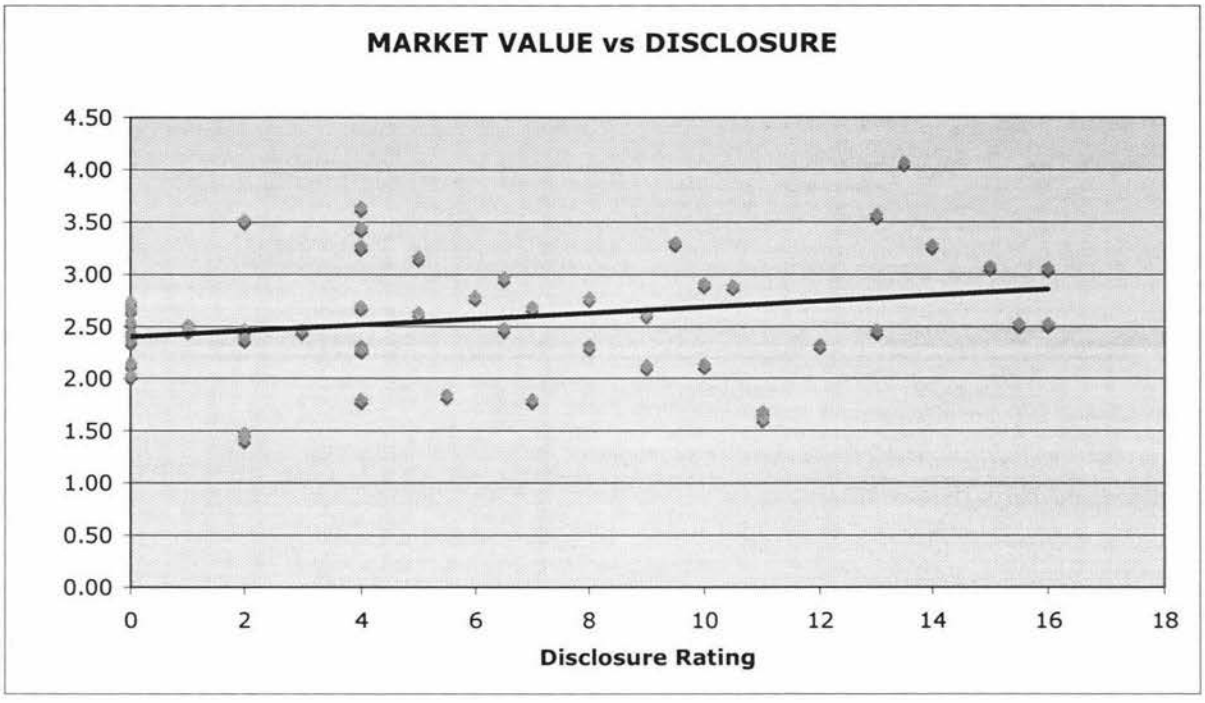
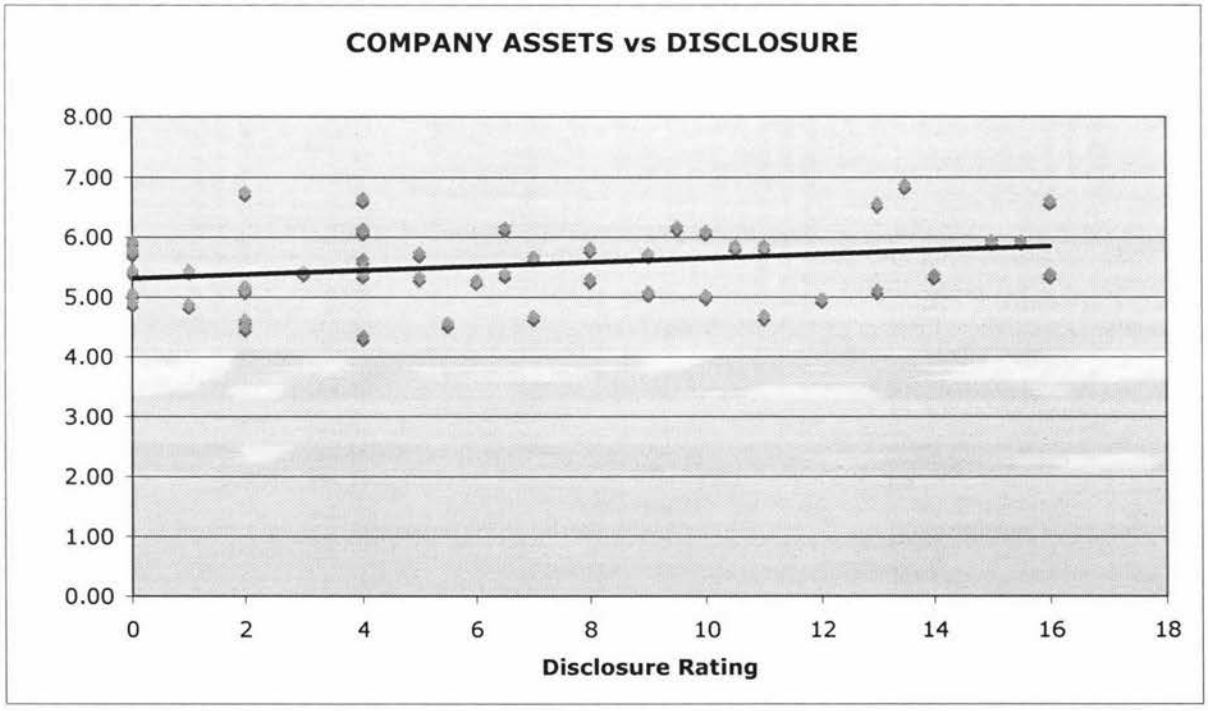


Figure 5.7: Disclosure and Asset Value



This conclusion applies when measuring company size both by market value capitalisation and company assets. The graphs plot the logarithms of market value and assets value to show the relativities without the extreme size range of the sample dominating the graphs. The plots show how widely the data is dispersed around the linear least squares regression line. The

Pearson product moment correlation coefficient, r, out of the possible range -1 to +1 is shown in Table 5.5.

Table 5.5: Size and Disclosure Correlation

	Market Value	*Assets Value*
Pearson Coefficient (r)	0.25	0.27
t ratio	1.76	1.97
Significance (one tail) (p)	.05	.05

Accordingly, the positive relationship found between knowledge resources disclosure and company size is statistically significant at the 95% level in both cases, but the degree of correlation shows the predictive power is weak.

This conclusion is confirmed in the least squares regression lines, represented by the following formulae, where *DR* is the independent variable disclosure rating:

Log Assets = 0.033 DR + 5.311

Standard error	*0.017*	*0.135*
t ratio	*1.978*	*39.211*
Significance (p)	*.05*	*<.0005*

F = 3.913 *Significance p = .05*

Standard error of estimate *0.591*

$R^2 = .075$

Log Market Value = 0.028 DR + 2.403

Standard error	*0.016*	*0.129*
T ratio	*1.760*	*18.597*
Significance (p)	*.05*	*<.0005*

F = 3.098 *Significance p >.05*

Standard error of estimate *0.563*

$R^2 = .061$

The statistical significance of the estimated intercepts in both formulae are high, but the significance just scrapes in at the 95% confidence level for the estimated coefficient for *DR*, which reflects the observed dispersion of the data. The low values of the explanatory measure, the coefficient of determination R^2, also reflect the dispersion of the data. There is a slightly stronger explanatory power for the assets relationship, but it is only 7.5%. The overall predictive capability of the model as measured by *F* is statistically significant at the 95% level for the asset relationship, but is less significant for the market value relationship, indicating further that the latter is a slightly less reliable model to use.

In summary, the positive relationship found shows that the hypothesis is not supported:

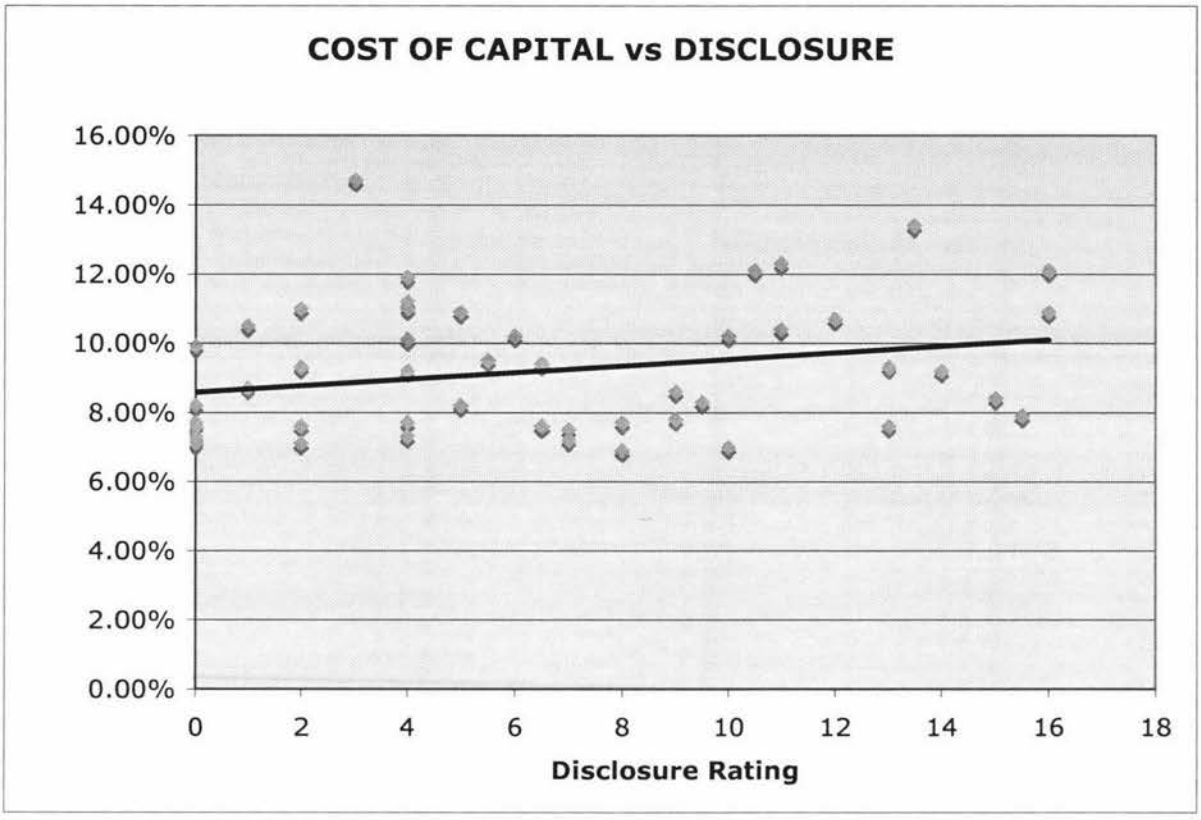
H5: Intangible asset disclosure is not related to company size.

There is a statistically significant positive relationship found between the disclosure rating and the size of companies, which is slightly stronger when a company's size is measured by its assets; but the explanatory and predictive power of the models is weak because of the wide dispersion of the observed data.

5.3.4 Disclosure and Cost of Capital

The disclosure ratings are shown in Table 5.2, and the cost of capital for each company is shown in Table 4.4. The following graph in Figure 5.8 compares each company's knowledge resources disclosure with its weighted average cost of capital, and shows that there is a positive relationship: increased disclosure is associated with a higher cost of capital.

Figure 5.8: Disclosure and Cost of Capital



The Pearson product moment correlation coefficient (r) for this relationship is 0.25 out of the possible range -1 to +1. The t ratio is 1.799, which is significant at the 95% confidence level. While statistically significant, the relationship is weak because of the wide dispersion of the data points around the linear least squares regression line, as follows:

WACC = 0.001 DR + 0.086

T ratio	*0.0005*	*0.0042*
Significance (p)	*.05*	*<.0005*

F = 3.235 Significance p >.05

Standard error of estimate 0.018

$R^2 = .063$

The statistical significance of the coefficient for the independent variable is at the 95% confidence level, and higher for the intercept. The predictive power of the model as measured

by F is under the 95% confidence level. There is a statistically significant relationship the coefficient of determination indicates an explanatory power of only 6.3%.

This finding of a positive relationship contradicts the hypothesis:

H6: Intangible asset disclosure is not related to cost of capital.

This finding of a positive relationship is also contrary to the lower costs of capital observed with expanded levels of voluntary disclosure by Hail (2002), Gietzmann & Ireland (2005), and Francis, Kurhana & Pereira (2005). However, it is consistent with the findings of Botosan & Plumlee (2002), and may point to the activity of noise traders, as suggested by the authors, in the higher profile companies that provide higher levels of voluntary disclosure.

Another possible statistical explanation is that several property and utility companies in the sample, with both lower costs of capital and lower disclosure rates, may also be contributing to the positive relationship found between these variables by weighing down the lower end of the regression line. The small samples falling in each industry grouping within the small New Zealand market make it difficult to successfully correct for such differences by isolating a study of the relationship to each industry group at a time.

In summary, the positive relationship found between the cost of capital and the disclosure rating is insufficiently strong to draw useful conclusions, but it does echo the difficulties that have been experienced by other researchers when investigating this relationship in similar studies. Small variations in the cost of capital around the mean market rate may be part of the measurement problem that has been experienced, and a more useful and variable related characteristic to explore could be the differences in access to capital that differing levels of disclosure achieve. This, of course, is also a complex construct to measure.

5.3.5 Disclosure and Tangible Assets

The non-current tangible assets to total assets ratio from Table 4.5 is plotted against the corresponding disclosure rating from Table 5.2 for each company in Figure 5.9. The least squares regression line shows an inverse relationship. Although the data plots are widely

dispersed, the inverse relationship is evident in the graph, and the Pearson product moment correlation coefficient r = -0.37 in the possible range -1 to +1. With a t ratio of -2.73 this coefficient has a significance of p = 0.005, which is statistically significant. The level of correlation found gives moderate evidence that a relationship exists. The least squares regression line is as follows:

Tangible Assets Ratio = -2.731 DR + 12.848

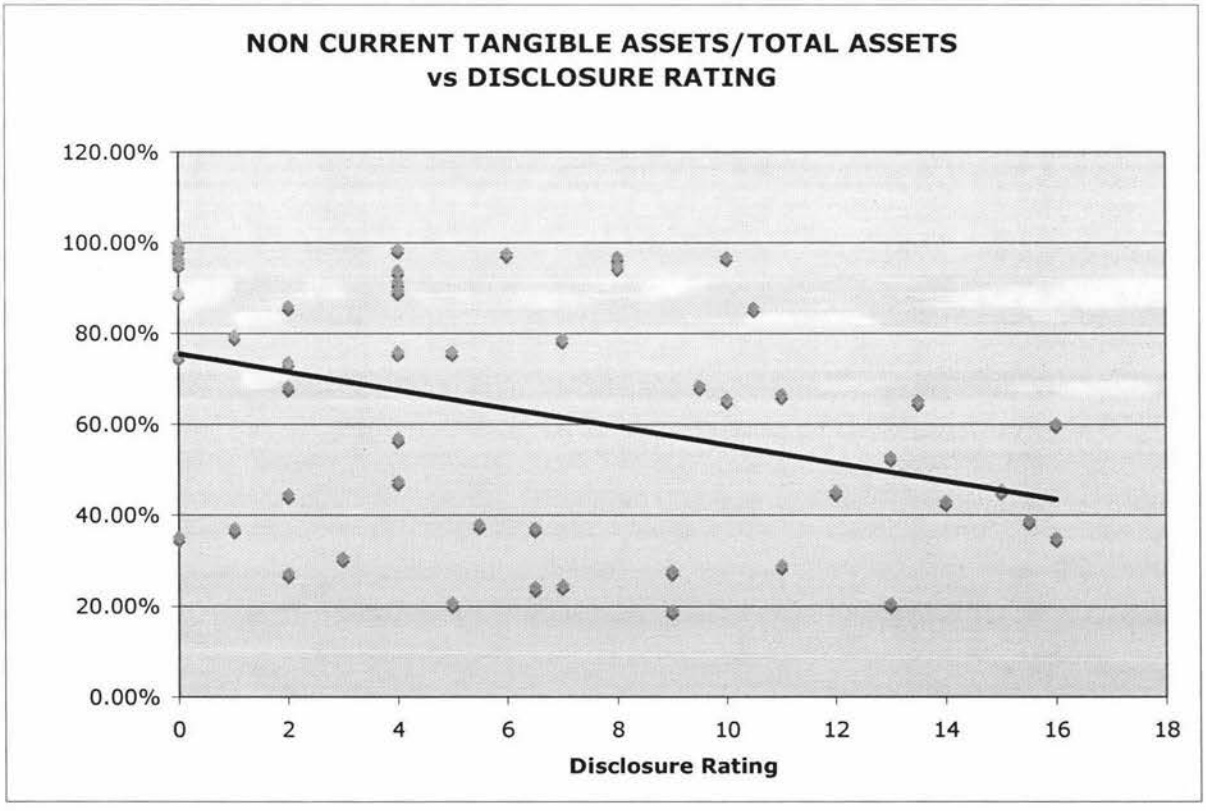
Standard error	*0.007*	*0.059*
t ratio	*-2.731*	*12.848*
Significance (p)	*.005*	*<.0005*

F = 7.459 *Significance p = .01*

Standard error of estimate *0.256*

$R^2 = .135$

Figure 5.9: Disclosure and Tangible Asset Intensity



The statistical significance of both the coefficient of the independent variable and the intercept is high, as is the significance of F, which further indicates a statistically significant inverse relationship exists. The coefficient of determination, however, shows that the explanatory power is only 13.5%.

This result points to a greater likelihood that a company with a proportionately lower intensity of investment in tangible assets is more likely to disclose its use of knowledge resources. The hypothesis is, therefore, not accepted:

H7: Intangible asset disclosure is not related to tangible asset intensity.

While at the low disclosure end of the scale there are several property, port and utility companies with high tangible asset intensities, there is also a small group of companies that both made low knowledge resources disclosure and had low tangible asset intensities, and which add to the dispersion of the data. They include Briscoe Group (BGR), Hallenstein (HLG) and Pumpkin Patch (PPL), all in the intensely competitive retail sector. It is necessary to look for another explanation for their disclosure strategy.

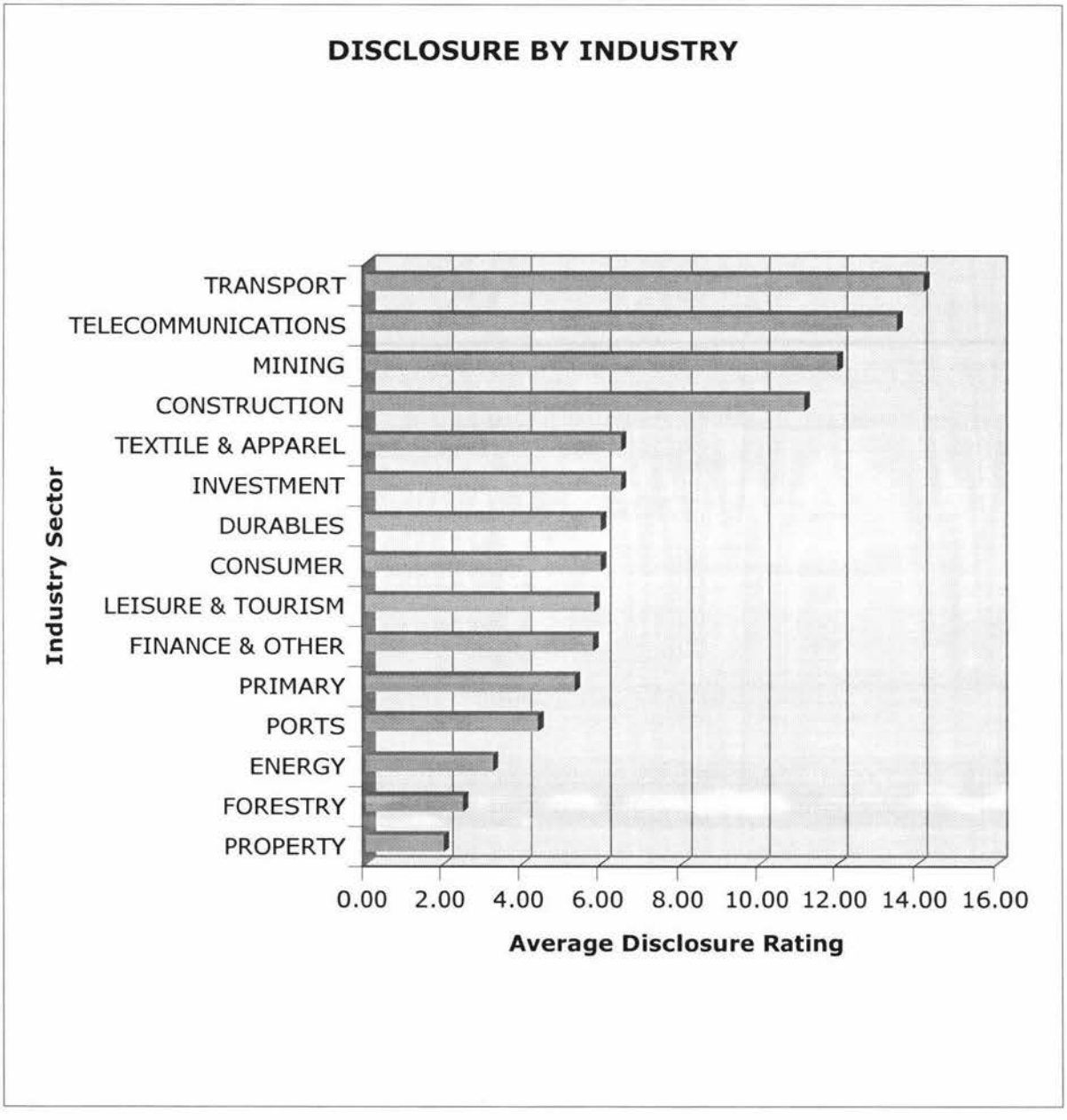
5.3.6 Disclosure by Industry

Figure 5.10 illustrates the average level of knowledge resources disclosure by industry sector. The highest level of disclosure is found in the turbulent and competitive transport and telecommunications sectors, followed closely by the mining and construction sectors.

These industries are at the knowledge-intensive end of the spectrum of the industries that the larger public companies in New Zealand are engaged in. The transport companies are people, service and marketing oriented businesses. The telecommunications company – Telecom (TEL) – is the largest technology company in New Zealand. The mining company – New Zealand Oil & Gas (NOG) – is primarily an exploration company making a high use of knowledge and technology. Many of the activities of the included construction companies relate to building supplies, and include significant innovation, research and new product development, e.g., Nuplex (NPX).

At the other end of the industry scale, the property, forestry, energy and port companies are capital-intensive businesses with more focus on their management of tangible assets than on intellectual capital. It is not surprising that they disclose less knowledge resources information in their reports.

Figure 5.10: Disclosure and Industry



5.3.7 Patterns of Disclosure Discussion

The strongest relationships between value creation and the disclosure rating were found when measuring value creation as NOPAT/Sales and future value added. The inverse relationship between disclosure and accounting profitability may be explained by the higher expenses

associated with investing in intangible assets, which are current expenses under present accounting standards. The positive relationship found with future value added is logical in that more investment in intangible assets to create future value can be expected to raise the expectations of future earnings in the capital markets. However, prior research into the relationship between intellectual capital reporting and value creation has had limited and mixed results, in part because of industry differences (Beaulieu, Williams & Wright, 2001; Abdomohammadi, 2005). The static resource-based disclosure measurement methods used in these studies may also have had a bearing on their mixed results.

Increasing disclosure with company size has not shown a statistically strong relationship in this study. Wong & Gardner (2005) noted increased disclosure by companies listed internationally, which is related to size. Telecom (TEL) and Fletcher Building (FBU), for example, are also listed in Australia and were given high disclosure ratings in this study. A strong relationship between voluntary disclosure content and size was observed in Nielson (2005b), but the disclosure content measured in that study included corporate governance metrics, social and sustainability as well as general descriptive context-building and branding-related material. Larger companies do have more to talk about in their reports.

Inconclusive results were obtained in the study of the relationship between disclosure and the cost of capital, which, as discussed already, is a finding consistent with debate in the literature. Although the New Zealand market contains few companies that are highly knowledge intensive, the industry sample used in this study has been sufficiently wide to show that companies with higher tangible asset intensities are less likely to disclose their use of knowledge resources to create value. These companies are less dependent on knowledge resources. No research was found specifically addressing this characteristic, but industry differenced observed in such studies as Abdolmohammadi (2005) have indicated that knowledge-intensive industries make higher intellectual capital disclosures.

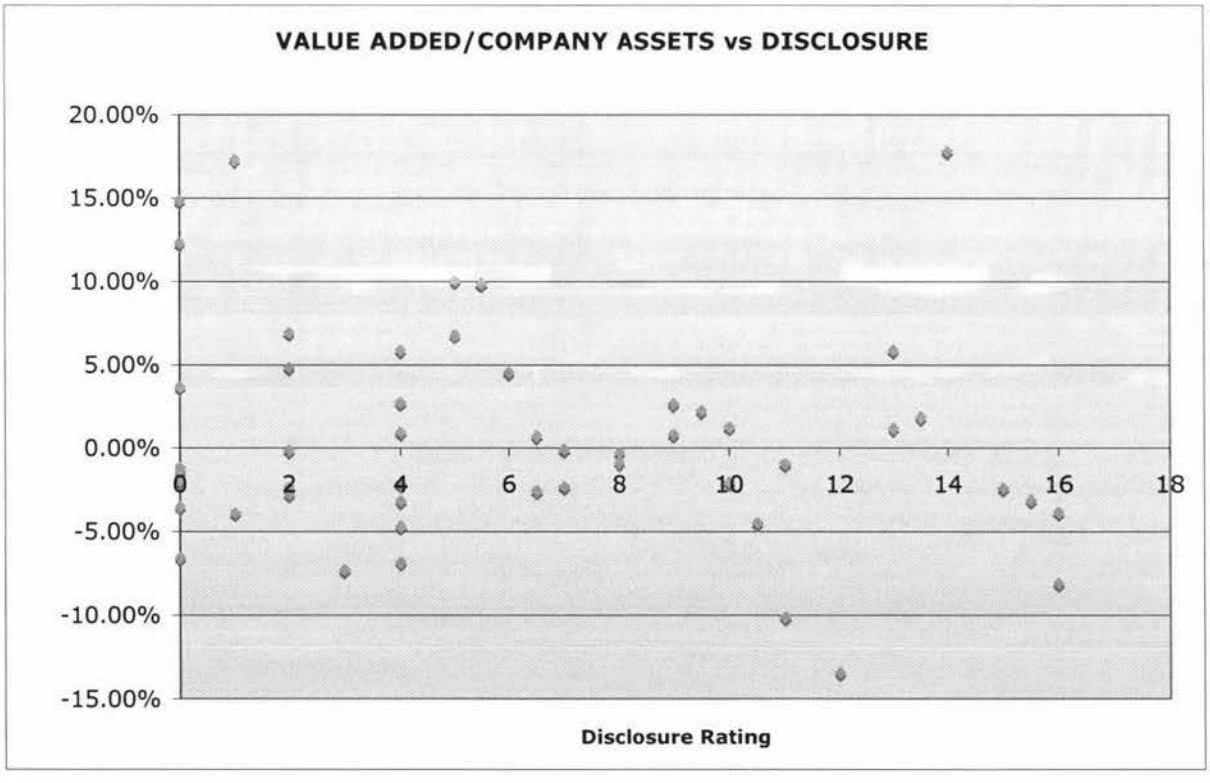
5.4 Motivation To Disclose

5.4.1 Disclosure As a Strategy

The weak relationships being found in this study reflect the wide dispersion of the data that is revealed in the various plots. Previous studies (e.g., FASB, 2001; Beaulieu, Williams & Wright, 2001; Abdolmohammadi, 2005) have referred to material inter-company differences as well as industry differences. This suggests that intellectual capital disclosure levels may be related to either company strategies or their stage in their present life cycle through growth to maturity and possible decline.

The plot presented in Figure 5.11 shows each company's knowledge resources disclosure compared to its endogenous value creation performance, measured as the economic value added by each company expressed as a ratio over assets employed to facilitate inter-company comparisons. This measure is used because it is likely to reflect company strategy differences.

Figure 5.11: Disclosure and Value Added

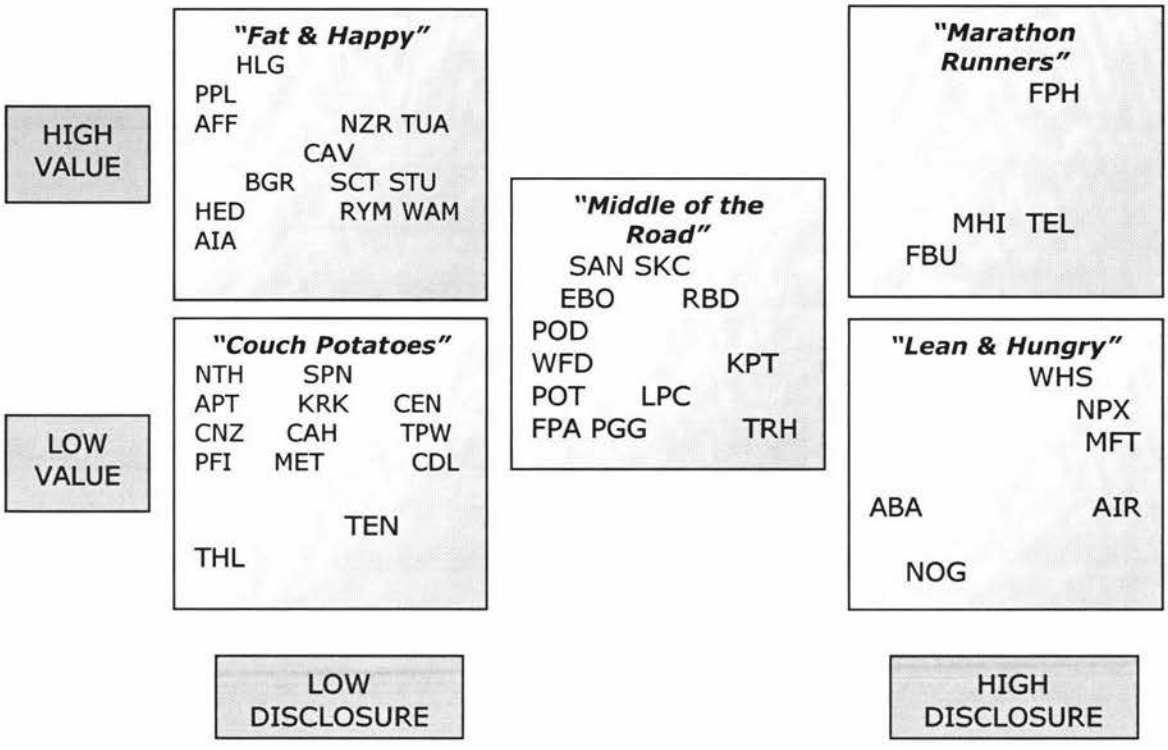


The correlation coefficient is only r = -0.19, indicating no substantive relationship between disclosure and value creation, but the graph also shows a fan at each extreme, or a "bow tie" pattern, which indicates heteroscedasticity in the residuals. This pattern suggests a grouping

of the companies into five clusters that have differing other characteristics, perhaps arising from strategy differences.

The five clusters can be represented in a matrix of value creation versus disclosure, as shown in Figure 5.12, which also shows which companies fall into each cluster. To facilitate discussion, each cluster is assigned a working name that reflects their stage in their business life cycles. The "Marathon Runners" are companies that are both performing well and making a high level of disclosure. They are well up their growth stage of their life cycle, and give every indication they can sustain a high level of performance in the long term. A "Lean and Hungry" group is making a similar high level of disclosure but has yet to turn their strategies into realised high performance. However, their strong intent to attain growth is clearly conveyed in their disclosures. At the other end of the scale there is a "Fat and Happy" group that is performing well but providing a low level of disclosure. These companies appear to see little need to disclose their strategies to the market, and to be occupying relatively secure positions in their respective markets. They appear to be sitting comfortably around the peak of their life cycle. A group designated "Couch Potatoes" is neither performing strongly nor making significant disclosures. Apart from the special case of property companies, this group appears to be in danger of decline, and includes several companies that have been takeover targets. Finally, a "Middle of the Road" group of companies are those that fall in the middle of the extremes. Perhaps surprisingly, it is not a dominant group.

Figure 5.12: Disclosure and Strategy Clustering



A closer look at the companies that fall within each cluster shows that they share a number of common characteristics, centred on their current stage in their life cycle. These clusters and their characteristics are as follows:

- *High profit, high disclosure – the "Marathon Runners"*: These are the strongly positioned companies, with high profitability and positive prospects. Fisher & Paykel Healthcare (FPH), which is an innovative company that is highly valued in the market, is prominent in this group. Others are Fletcher Building (FBU), Michael Hill (MHI) and Telecom (TEL), which at the time were also all firmly established companies with international expansion programmes in place. Sky City (SKC) is similarly profitable, and, although its disclosure level is only moderate and more about its operational issues than its value creation strategies, it most closely fits into this group. These growing companies can all be fairly placed in the strong expansionary phase of a life cycle, and are using their annual reports to communicate their intentions to expand further.

- *Low profit, high disclosure – the "Lean and Hungry":* These are companies that have experienced profitability difficulties, but they are working hard to sort out their problems and turn their performance around. Each has a different story to tell. The Warehouse (WHS) is recovering from the drop in profitability after a difficult expansion to Australia, and is trying to revitalise its domestic operation. Mainfreight (MFT) has just absorbed a major competitor in a disputed takeover move, while continuing with an ambitious international expansion programme. Air New Zealand (AIR) is in the midst of a major turnaround project, while operating in a very competitive trading environment with volatile input costs. Nuplex (NPX) is engaged in several innovative research and development projects, and has had to adjust to unfavourable changes in key input costs and foreign exchange rates. Abano Healthcare (ABA) has just divested itself of a large low margin segment of its business and is rebuilding its remaining core business. New Zealand Oil & Gas (NOG) is a mining company with depressed profitability because it is presently in an exploration rather than a harvesting phase. Toll New Zealand (TRH), having recently taken over Tranzrail, is undertaking a major repositioning of its business from full infrastructure ownership to a focus on marketing and operations. These companies are using their annual reports to tell their stories about how they setting up their companies ready to climb a future growth path.
- *High profit, low disclosure – the "Fat and Happy":* This profitable group of companies is performing well, but is reluctant to say much about how they are achieving their results. Very profitable companies like Hallensteins (HLG) and Pumpkin Patch (PPL) reveal little in their annual reports beyond the bare facts of the business they are in and where. Other profitable companies in the group are Auckland International Airport (AIA), Briscoes (BGR), New Zealand Refining (NZR), Ryman Healthcare (RYM), Scott Technology (SCT), Steel &

Tube (STU), Turners Auctions (TUA) and Waste Management (WAM), which reveal more about their assets and operations, but still reveal little about their intellectual capital and value creation strategies. Affco (AFF) and Horizon Energy (HED) in this group offer very little disclosure beyond that necessary to comply with their reporting obligations. Some of these companies, such as New Zealand Refining (NZR), are sitting comfortably with a securely profitable positioning in the market. A couple of this group, Turners Auctions (TUA) and Waste Management (WAM), are engaged in some expansion activities, but they do not appear to be as stretched as the *Lean and Hungry* group's companies by the scale of their challenges. Some of the companies, especially Briscoes (BGR), Hallensteins (HLG) and Pumpkin Patch (PPL), could simply be playing their cards close to their chests, to reveal as little as they must to their retail competitors. As a group, these companies have the appearance of being at the comfortable upper reaches of their life cycles, with little to say about where they go from here.

- *Low profit, low disclosure – the "Couch Potatoes":* These companies are neither performing well nor apparently doing much about it. They include Carter Holt (CAH), Capital Properties (CNZ), Metlifecare (MET) and Tenon (TEN), all companies that have been takeover targets. Several port – Northland (NTH) and Southport (SPN) – and energy utility – Contact (CEN) and Trustpower (TPW) – companies fall into this group. So too do several property trusts – AMP (APT), Capital Properties (CNZ), Metlifecare (MET), Property For Industry (PFI) and Trans Tasman Properties (TTP) – which enhance their profitability with revaluations that are excluded from the value added calculation used in this analysis. Traditional department store Kirkaldies (KRK) and tourism operators CDL Hotels (CDL) and Tourism Holdings (THL) also fall into this group. These companies have little to say in their

reports about how they intend to address their current performance issues, beyond broad strategies and operational details. With the possible exception of the property trusts, the companies in this group appear to be in danger of slipping over their peak performance and starting down the declining side of their life cycles.

- *Moderate profit, moderate disclosure – the "Middle of the Road":* The companies in this group are hovering around the centre of the chart, neither adding a lot of value nor losing a lot, but communicating about what they are doing in their reports moderately well. They include Sanford (SAN), Restaurant Brands (RBD), Ebos (EBO), Port of Tauranga (POT), Lyttelton Port (LPC), Wakefield Hospital (WFD), Hellaby (HBY), Pod (POD) and Fisher & Paykel Appliances (FPA). These are companies that are perhaps best described as sound companies, none of which appear likely to do anything major and unexpected in the near future. Kiwi Income Property (KPT) is in this group, and has a lot to say in its latest report about a major property development project that it plans (its large Sylvia Park retail development in Auckland), and which will require a large amount of capital. Kiwi Income Property (KPT) is positioned on the chart near the border with the "Lean and Hungry" group of companies, which show similar characteristics of planned growth. The other company in this group that has taken a major recent initiative is Pyne Gould Guinness (PGG) when it merged with its major competitor (Wrightsons), but this event took place after the end of the reporting period reviewed. Pyne Gould Guinness (PGG) appears on the plot near the border with the "Couch Potato" group, and its prospects may have been revitalised by this merger. As a group, these companies lack the extremes of the companies in the other groups, and are typically in the stable growth stage of their life cycle.

This model suggests that increased knowledge resources disclosure is directly related to a company's future growth intentions. Companies that are engaged in a turnaround to position themselves for future growth, and those already in the rapid growth stages of their life cycle, appear to be more motivated to voluntarily disclose their knowledge resources in their annual reports. These growth-oriented companies are at the life cycle stages when most support is needed from their shareholders, either to hold their support while they get through a turnaround and back onto a growth path, or to fund an ambitious expansion. This finding suggests the hypothesis that voluntary disclosure is a deliberate strategy to garner shareholder support. Contrary to a normative view that companies should disclose the information wanted by stakeholders, it appears companies may be selectively disclosing intangible asset value creation information to manage stakeholder perceptions. This hypothesis is consistent with the high profile use of knowledge resources disclosure by Skandia during its rapid growth phase in the late 1990s, but which was discontinued when that phase ended (Sveiby, 2005). It is also consistent with the findings of Francis, Kurhana & Pereira (2005) that companies that are more dependent on external financing tend to provide a higher level of voluntary information disclosure.

Further evidence comes from Mouritsen & Larsen (2005), who reported on an extended association with the development of an intellectual capital statement in a Danish company, Coloplast:

> *We followed the development and use of the intellectual capital statement as a process of development and therefore also we came to understand that it was a means to an end, namely to influence behaviour internally and externally to the firm.* (p. 381)

They observed a shift of company objectives from description to intervention, similar to the shift of emphasis from performance measurement to performance management that was advocated by Otley (2003). The companies using the disclosure of their use of intangible assets in this way appear to have made the transition to fully incorporate the management of intangibles into their value creation strategy.

As well as the external strategy role for intangible asset disclosure aimed at the capital markets that can be discerned in these reports, there is also likely to be an internal strategy aimed at employees as stakeholders. Such people-intensive companies as Air New Zealand (AIR), Mainfreight (MFT), Michael Hill (MHI), Sky City (SKC), Telecom (TEL) and The Warehouse (WHS) include a strong emphasis on the contribution of their human capital, which has an appearance in presentation of being internally motivational for staff as stakeholders, as well as being a disclosure aimed at shareholders and other external stakeholders.

Profitable companies that are no longer experiencing rapid growth may be less motivated to disclose their capabilities and strategies. While some may be comfortably secure in their present situation, others may feel threatened by competition should they reveal how they are able to perform so profitably. These companies are less likely to be placing big demands on their shareholders than the turnaround and expansionary companies.

Those companies that are heading into a declining stage also appear to be less motivated towards disclosure, perhaps because they have little that is useful to disclose about their strategies and initiatives, or perhaps because they believe they are exposed to takeover interest and wish to maintain a low profile.

Accordingly there appears to be a relationship between disclosure and strategy, and the hypothesis is not accepted:

H8: Intangible asset disclosure is not related to strategy.

5.4.2 Disclosure Prediction Model

The several relationships that have been found between knowledge resources disclosure and other company characteristics have not been strong. The explanatory power of these individually weak relationships working together in combination may be stronger, which suggests the hypothesis that a predictive model exists between these characteristics and the intellectual disclosure made by a company in its annual report.

A multiple linear least squares regression model was used to test this hypothesis. The intellectual capital disclosure rating was taken as the independent variable. The following dependent variables were progressively adding in order of the strength of their individual correlation coefficients with the independent variable:

- Profitability margin expressed as a ratio of net operating profit after tax (NOPAT), adjusted to remove abnormal profits to facilitate comparisons, over sales.
- Future value added (FVA) expressed as a ratio over market value (MV) to enable inter-company comparisons.
- Tangible asset intensity measured as the tangible assets/total assets ratio.
- Company size measured as assets expressed as a logarithm (base 10).

The data used is presented in Tables 4.4 and 4.5.

Because of outlier data problems with respect to the sales figures for Kiwi Income Property (KPT) and New Zealand Oil & Gas (NOG) already referred to, these companies were omitted from the analysis.

In addition, a qualitative variable was developed to measure whether a company was planning a rapid expansion or was going through a major business turnaround, and was likely to use intellectual capital as a strategy to secure shareholder support and funding for the changes that were taking place. This variable was expressed as a dummy variable, taking the value of "1" if the company met this criterion and "0" if it did not. Assigning this value is in part a subjective process. Companies do not always specifically declare that they have a strategy for their future that amounts to either a major turnaround or a rapid expansion. Even if they do there is a question of degree. The included companies are Abano Healthcare (ABA), Air New Zealand (AIR), Fletcher Building (FBU), Fisher & Paykel Healthcare (FPH), Mainfreight (MFT), Michael Hill (MHI), Nuplex (NPX) and The Warehouse (WHS). Their large scale expansionary and turnaround strategies are explicitly discussed in their annual reports. A

variety of large scale investment, process re-engineering, international expansion, merger and acquisition and innovative research and development activities are described. For a company such as Tenon (TEN), which reports that it has divested the bulk of its assets and is focusing on developing a new international distribution and marketing capability, the degree of expansionary change that is currently taking place was judged to be much lower, although restructuring activity was high in the previous year.

The resulting regression model found was:

$$DR = 7.52\,PM + 1.41\,FV - 4.91\,TA + 1.34\,SA + 3.02\,E - 0.96$$

Standard error	*1.53*	*0.85*	*1.92*	*1.11*	*4.12*	*4.49*
t ratio	*4.92*	*1.65*	*-2.56*	*1.20*	*0.73*	*-0.21*
Significance (p)	*<.005*	*.10*	*.01*	*>.1*	*>.1*	*>.1*

F = 13.62 Significance p <.01

Standard error of estimate = 3.26

$R^2 = 0.62$

Where *DR is the disclosure rating*

PM is a profitability margin measure, NOPAT/Sales

FV is future value added/market value

TA is the ratio tangible assets/total assets

SA is company size measured as the log of assets

E is a dummy variable to capture expansionary activity

The coefficient of determination, R^2, shows this model explains 62% of the variance in the dependent variable, DR. Although the coefficients found for P and T are statistically significant to a very high level of confidence, those for F, S, E and the intercept are at or below the 90% confidence level, which reflects the variability of the data. The overall measure of predictive power, F, however, shows a reassuring statistical significance above the 99% level.

Correlations are shown between the independent variables in Table 5.6, to check for collinearity. The relationships found are mostly very low. The strongest relationship is a correlation of r = 0.433 between the future value and the dummy variable identifying expansion plans, which is logical in that the capital markets are likely to value expansionary firms more highly for their higher earnings growth potential. However, this is not a strong relationship, and overall Table 5.6 shows collinearity is at a low level.

Table 5.6: Test For Collinearity

(r)	PM	FV	TA	SA
FV	0.002			
TA	0.126	0.016		
SA	-0.048	0.285	0.185	
E	-0.015	0.433	-0.285	0.24

5.4.3 Motivation Discussion

Strategy differences appear to explain a significant proportion of the variation observed in the plotted residuals between value added and disclosure, and are a likely driver that motivates disclosure. A motivation for the Danish intellectual capital statement guidelines has been the Danish Government's aim to improve the access to capital for innovative knowledge intensive Danish companies, and thereby to encourage economic growth; and a similar motivation may underlie voluntary disclosure by New Zealand companies (DMSTI, 2003a; Mouritsen, Bukh & Marr, 2004).

The multiple regression model accounts for nearly two thirds of the variation in the disclosure rating found between companies. The signs on the coefficients reflect the relationships found in the separate correlations for the independent variables, being positive for all but the tangible asset ratio. Characteristics that suggest more disclosure are:

- Higher profitability margins
- Capital markets placing a higher future value on the company
- Expansionary plans
- Larger companies

Companies with a higher proportion of tangible assets are likely to have lower disclosure ratings.

The other third of the variation remains unexplained by this research. There is a wide dispersion between companies in the data plots, and the breakdown of the disclosure ratings into categories suggests a progression from broad to detailed disclosure. Part of the remaining difference may simply be due to a differing level of awareness or interest in the voluntary disclosure of a company's use of knowledge resources. This research suggests that the conservative reporting of a company such as Affco (AFF) may be losing it the opportunity to gain the future value in their market price that high disclosure companies such as Mainfreight (MFT) are experiencing. Progressive and profitable companies such as Hallenstein (HLG), Pumpkin Patch (PPL) and Briscoes (BRG) in competitive markets have low disclosure ratings, which, prima facie, may be related to the high competition in their market sectors.

Another explanation for the remaining third of the variability may lie in the experimental nature of the disclosure rating method, with its novel measuring instrument based on Danish disclosure guidelines. A further avenue for investigation, for example, may be to compare the categories of disclosure with company characteristics.

Different unidentified and unmeasured company characteristics may also be causal variables that are not taken into account in this research. Researchers such as Beaulieu, Williams & Wright (2001) and Abdolmohammadi (2005) have noted the company and industry differences that contribute to the variability in voluntary disclosure practices, and some of this variation will no doubt be simply due to arbitrary management decisions.

5.5 Outlook

5.5.1 Outlook Data And Analysis

Any outlook disclosures found in the 50 sample companys' annual reports were almost exclusively in the management analysis and discussion by the board's chairman or the

managing director. The few exceptions were where additional outlook disclosures were presented in business segment reports, such as in the Fletcher Building (FBU) report.

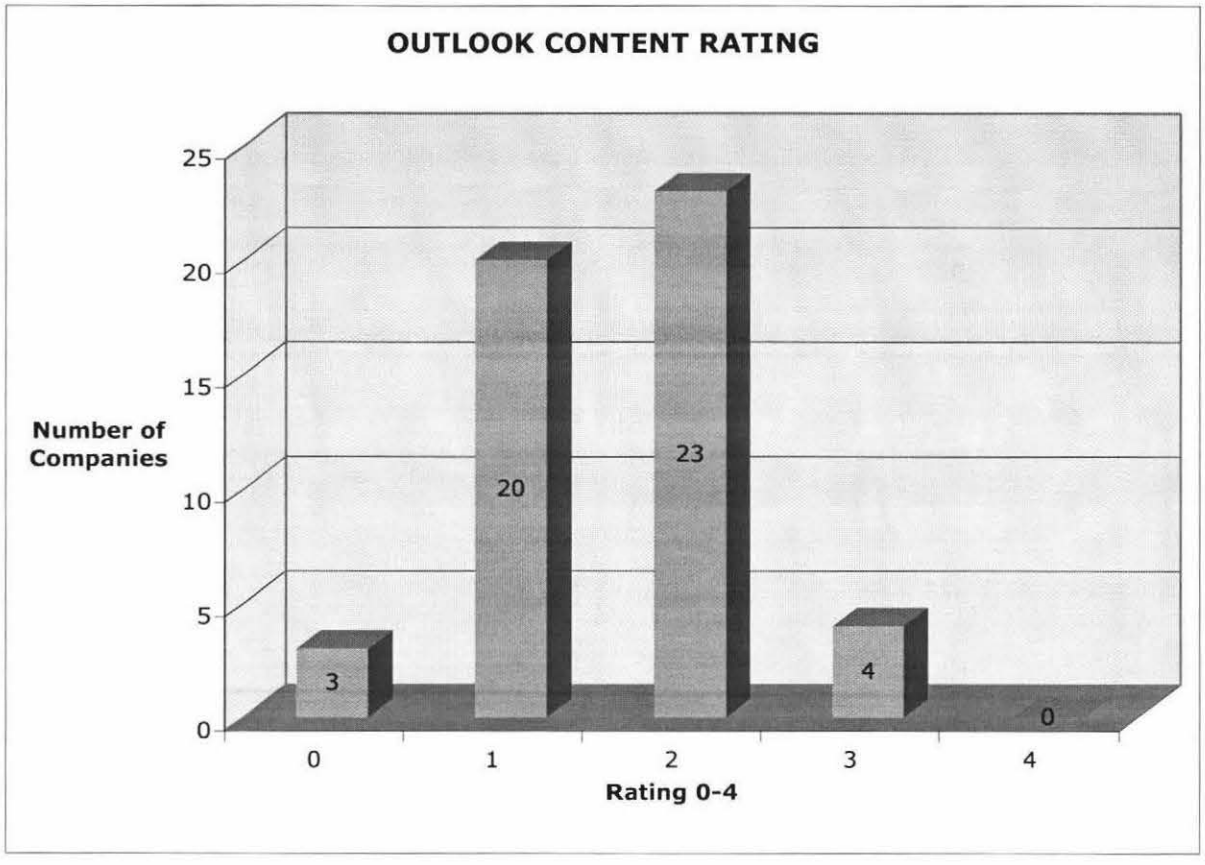
Table 5.7 shows the outlook disclosure ratings found by company:

Table 5.7: Outlook Disclosure Ratings

NZX CODE	RATING 0 - 4	NZX CODE	RATING 0 - 4
ABA	2	NPX	2
AFF	0	NTH	1
AIA	3	NZR	2
AIR	3	PFI	2
APT	2	PGG	2
BGR	2	POD	2
CAH	1	POT	2
CAV	2	PPL	1
CDL	1	RBD	2
CEN	1	RYM	2
CNZ	1	SAN	1
EBO	1	SCT	1
FBU	3	SKC	1
FPA	3	SPN	1
FPH	2	STU	2
HBY	2	TEL	2
HED	0	TEN	2
HLG	1	THL	1
KPT	2	TPW	1
KRK	0	TRH	1
LPC	1	TTP	1
MET	1	TUA	1
MFT	2	WAM	2
MHI	2	WFD	2
NOG	1	WHS	2
	Mean	1.53	
	Std Dev	0.73	

The following chart shows that most companies (94%) disclosed at least some outlook comment in their annual report, but that only four (8%) gave extensive detail and none gave a comprehensive integrated outlook statement. With a mean rating of only 1.5 and a standard deviation of 0.7, the typical outlook disclosure in the sample companies is half way between being "sketchy" and "systematic".

Figure 5.13: Outlook Disclosure Ratings



5.5.2 Outlook Discussion

This research gives clear evidence of the reluctance of boards and managers to disclose specific quantitative performance forecasts. There is sufficient evidence of outlook disclosure to not support the hypothesis:

H10: New Zealand public companies do not disclose their forward-looking performance outlook.

However, the level of disclosure found is very low, and is primarily qualitative rather than quantitative. The danger directors and managers see in being specific with their quantified outlook disclosure is exemplified by Cavalier (CAV), whose managing director forecast earnings of $22.5M for 2005 in its 2004 annual report. This was one of the few quantified outlook forecasts found in all the annual reports of both 2004 and 2005 that were reviewed in the course of this research. The actual Cavalier (CAV) operating earnings were 13% lower at $19.5M for 2005. This result was then reduced by a further $5.8M when the company's board of directors decided to make an abnormal write-off of research and development expenditure

that had been capitalised in prior years, because of doubts about a project's future earnings potential. With a final 2005 outcome 40% lower than he forecast in the 2004 report, the managing director of Cavalier (CAV), perhaps understandably, did not specifically forecast the 2006 earnings in the company's 2005 report.

In an Australian study (Kent & Ung, 2003), a similar lack of quantitative forward-looking disclosure was found. In that case 55% of the 117 companies in the sample gave qualitative outlook comment, which the researchers noted tended to have a positive bias. On a 7 point rating scale, only one company gave a "good to excellent" outlook disclosure, and 32% gave a "fair to acceptable" disclosure. However, 45% gave no outlook disclosure and 21% were rated "poor." Only 6% of New Zealand companies provided no outlook comment in this sample. The sample used for the Australian study was from the early 1990s and may not be representative of current Australian practices. Nevertheless, the patterns found in the two studies indicate very few companies in Australia and New Zealand provided detailed outlook comment.

5.6 Summary

The four companies that provided extensive disclosure, Auckland International Airport (AIA), Air New Zealand (AIR), Fletcher Building (FBU) and Fisher & Paykel Appliances (FPA), did not publish specific earnings forecasts, although Auckland International Airport (AIA) did indicate it expected the next year's earnings to "exceed $100M", which can at best be described as a broad quantitative indication. These companies did, however, provide a useful specific discussion about their marketing and strategic activities and trends, and a discussion about the possible impact of relevant earnings risks, which was likely to be helpful to investors and analysts making their own judgements about each company's earnings outlook. Fletcher Building (FBU) also gave fairly detailed comment about activities relevant to the outlook in each segment of its operations.

In contrast, most other annual reports made at best a generalised comment, exemplified by this summary of the Sanford (SAN) board's outlook:

> *Overall, our Company is very well placed to continue to progress through 2005 and beyond. But improved profitability will require a drop in the value of the New Zealand dollar to more realistic levels and the market for most seafood species remaining positive.* (Sanford Ltd. Annual Report 2004, p. 10).

This analysis of current practice indicates it would be a significant change from the present low level of voluntary outlook disclosure should New Zealand companies be required to include a specific and detailed outlook statement, with quantified earnings forecasts, in their annual reports.

Brown & Higgins (2005) reviewed the way managers guide the expectations of the capital markets when releasing outlook information. This practice is consistent with the game theory of disclosure (Dye, 2001; Stocken, 2000). Under the continuous disclosure provisions of NZSX listing rules (NZSX, 2005a) listed companies are required to disclose changes that could have a material impact on their performance as they arise. These rules may reduce the scope for games to be played, but may also have the effect of reducing the willingness of companies to provide specific outlook projections in their one-off annual reports rather than on a continuous basis.

6 Conclusions

6.1 Issues On Method

This research has established that, of the sample of 50 companies, 84% of New Zealand listed public companies are voluntarily disclosing their use of knowledge resources to create value in their annual reports, and 16% are doing so extensively. Only 16% make no disclosures. The measurement instrument used, based on the Danish intellectual capital statement guidelines, has proved to be effective in measuring disclosure in a manner that facilitates inter-company comparisons and the investigation of explanatory relationships with other company characteristics. This approach has also has potential to facilitate disclosure level comparisons between countries.

A rating scale for four stages in the use of intangible assets produced a meaningful measurement of intangible asset disclosure expressed as a holistic and dynamic concept. Evidence was found that this scale reveals the stages of evolution in intangible asset disclosure from a generalised *narrative* level through identifying *challenges* and taking *initiatives* to the more advanced level of applying and comparing *indicators* of performance.

The results give a more precise, useful and relevant measurement of the intangible assets construct than the results obtained in the comparative control study, which showed a very low level of disclosure in the sample of 100 New Zealand companies. It also, somewhat surprisingly, showed a low level of disclosure in benchmark companies that specifically publish dedicated intellectual capital sections in their annual reports. The control study was carried out using a content analysis of the intellectual capital terminology in a methodology based on Bontis (2003), which, as noted in the literature survey, has been used in several other intellectual capital disclosure studies internationally. This different result is in part due to the different report content analysis methodology adopted, but it is also due to the measurement construct used. The Danish guidelines are based on intangible assets used as a dynamic knowledge resource for value creation, which is the emerging paradigm observed in

the literature review. The dynamic construct is more relevant to the reality of how intangible assets are being used by companies than the earlier static balance sheet perception of them. While they are not using the specialised intellectual capital terminology developed for the Bontis (2003) method, the emerging dynamic perception of intangible assets is apparent in the nature of the discussion on the role of intangible assets in the leading innovative company annual reports in New Zealand. These reports disclose how intangible assets play a key role in a holistic approach to value creation within these companies. The structure is not as formal as the Danish guidelines, and the approaches vary by the nature of each business, but the quality and relevance of their contents meets similar expectations. In an informal comparison, using the intellectual capital statements prepared by Danish firms COWI and Carl Bro as content rather than format benchmarks, the annual reports of the highest rated New Zealand companies compared very favourably in terms of both the quality and quantity of their disclosure.

This positive finding supports the argument that principles-based regulation can encourage higher quality reporting. A rules approach promotes uniformity and a prompt response by companies. The small number of exemplars identified by the methods used in this research are voluntarily setting a relatively high standard for the disclosure of their value creation strategies beyond the level a rules approach is likely to set. With 84% of the sample voluntarily disclosing their use of knowledge resources to create value to at least some degree, there is evidence that Guideline 4.2 of the NZSC's Principles of Corporate Governance (NZSC, 2004) is working successfully to encourage the disclosure of "sufficient meaningful information."

6.2 Contribution To Knowledge

The finding of a positive relationship between future value added and intangible asset disclosure lends support for the dynamic role of intangible assets used as a strategy to create future value, and for the usefulness of disclosure to communicate this activity to the capital

markets. For companies that were found to be making a high level of intellectual capital disclosure, such as Air New Zealand (AIR), Fletcher Building (FBU), Fisher & Paykel Healthcare (FPH), Mainfreight (MFT), Michael Hill (MHI), Nuplex (NPX), Telecom (TEL) and The Warehouse (WHS), the capital markets recognised their future value creation efforts in their market price.

The logical inverse relationship found between tangible asset intensity and disclosure reflects the greater significance of knowledge resource use to create value in information-intensive industries.

The inverse relationship found between disclosure and profitability may be explained by the short-term negative effect on profitability when a company invests in intangible assets such as advertising, training and research that are expensed under present accounting standards. This possible explanation has not been explored in this study.

The positive relationship found with company size reflects other research. The weak inverse relationship found with the cost of capital reflects the mixed results found in other research.

Differences in company strategies are also shown to be possible explanations for part of the variance observed, with companies more actively engaged in significant expansionary plans having higher levels of disclosure. The strategy differences observed may be explained in part by the stage of a company's life cycle, with greater disclosure in growing companies. Companies in very competitive industries, for example, Briscoes (BRG), Hallensteins (HLG) and Pumpkin Patch (PPL), gained low disclosure ratings, which may reflect competitive concerns.

The predictive model developed from the explanatory relationships researched explained 62% of the variance in disclosure found. The balance may be explained in part by the experimental nature of the instrument used to measure disclosure, but while disclosure is voluntary there are likely to be significant arbitrary variations between the reporting policies adopted by companies.

Reporting on value creation relates to future performance prospects. It reduces the "black box" nature of the value creation processes within a company as seen from outside. Opening that "black box" fully by providing an outlook projection and an explanatory justification is normal practice when a prospectus is prepared to attract investment in a new company Bukh, 2003). Annual reports rarely go that far to disclose an existing company's future prospects.

The research found that very few New Zealand companies are willing to disclose their earnings projections quantitatively. Nearly all (94%) made some outlook comment, but most went no further than generalised qualitative comment on prospects and risk exposures. Only 8% provided extensive outlook comment, but even these companies gave hardly any quantitative detail. This is similar to the low level of outlook comment in Australian annual reports found by Kent & Ung (2003), which was also almost all qualitative; but the 6% of New Zealand companies making no disclosure was much lower than the 45% proportion in Australia[4].

Finally, returning to the four main research questions raised in Chapter Four:

Question 1: Can a more accurate measurement for the disclosure of intangible assets be found, focussing on the use of intangible assets to create value, as a holistic, dynamic construct? Could such a measure be developed from the innovative Danish intellectual capital reporting guidelines?

This research has demonstrated that such a measurement tool can be developed, and that it provides the means to undertake useful quantitative analysis and comparisons.

Question 2: Do New Zealand publicly listed companies voluntarily report on their capability and use of intangible assets as a value creation strategy?

With 84% of the 50 sample companies found to be providing such voluntary disclosures, this question is answered in the affirmative.

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[4] The reports sample used for the Australian study was from the early 1990s and may not be representative of current Australian practices, which may undermine the significance of this difference.

Question 3: What motivates a company to disclose its use of intangible assets to create value, and is there any relationship between the disclosure of intangible assets and value creation performance?

While a weak positive relationship between disclosure and value creation performance is shown in the research, the motivation to make disclosures appears also to be quite strongly linked to a company's expansion plans, its need for stakeholder support and how the markets assess its future value creation prospects.

Question 4: Taking the disclosure of value creation strategies the next step, what forward-looking performance outlook disclosures do New Zealand public companies provide in their annual reports?

The research has shown a low level of forward-looking outlook disclosure in the sample company's annual reports, and the literature review and empirical findings suggest that this practice reflects how interested external parties prefer to make their own informed outlook projections. The disclosure by a company of its value creation strategies and capabilities appear to be valued much higher by these parties than its subjective interpretations of its own prospects.

6.3 Future Research Questions

This research has highlighted shortcomings in the present understanding of intangible assets that suggest the following possible future research questions:

- Could the intangible asset disclosure ratings approach based on the Danish intellectual capital statements, that has been developed for this research, be developed in more detail to be more effective for measuring the use of intangible asset creation from a holistic and dynamic strategy perspective? Could an experimental design be developed to reduce the researcher subjectivity of the ratings to facilitate comparative studies?

- What motivates a company to disclose its use of intangible assets in its strategy and performance measures? What further variables could explain company disclosure policy differences?
- How does the management process for a company's stock of intangible assets differ from the management process for the flow of its intangible assets in use?
- What are the linkages between intangible assets and business strategy formulation? Is it meaningful to focus just on intangible assets, or is value creation strategy development only effective when all of the resources available to a company, including tangible physical and financial assets, are considered holistically?
- What are the linkages between the use of intangible assets reported to the board and those details disclosed externally? (Gray, Roos & Rastas, 2004, p. 244)
- What intangible asset disclosures do analysts and investors look for, and how do they use this information? (Bukh, 2003; Wong & Gardner, 2005)
- Could the disclosure index methodology used for New Zealand electricity companies by Hook, Coy & Davey (2002) be used to develop a stakeholder-driven intangible asset disclosure index?
- What is the case for more explicit forward-looking expectations to be disclosed by managers who are intimately involved in developing a company's value creation model – in the style of a prospectus? How should risk identification and management be addressed? How do competitive advantage and negotiating strength risks restrict disclosure? What "safe harbour" protection is needed to encourage managers to provide more forward-looking information without high exposure to litigation?

- What effects do intangible asset disclosures have on the volatility and level of market prices?
- What is the relationship between the amount of intangible asset information it discloses and the cost of capital faced by a company? (Core, 2001)
- What innovative forms might future intangible asset disclosures take? How do non-financial performance measures fit in with the standardised XBRL approach? Should intangible asset disclosure be confined to annual reports, or are there advantages to more frequent and flexible disclosure mediums, with options for stakeholders to customise information to meet their needs? (Vasarhelyi & Alles, 2004).

6.4 *The Elephant In The Room*

Confronting the intangible assets *elephant in the room* has revealed the *elephant* is not so big after all. This research has found that, of the sample of 50 listed New Zealand public companies, 84% recognise and disclose their use of intangible assets, 16% extensively. This contrasts with the earlier international and New Zealand findings that there was a low level of intangible assets, or intellectual capital, disclosure. This research has shown that there are serious conceptual problems underlying much of the earlier work in the intangible assets area, leading to the size of the *elephant* being overstated. Refocusing attention on intangible assets, from an historical accounting perspective to a future value creation and corporate governance and strategic management perspective, changes how intangible assets are understood. The issues become easier to recognise and more familiar, and we have shown empirically that they are part of the mainstream discourse in business: that they are not just the avoided *elephant in the room.*

The paradigm of intangible assets that dominated the discourse through the 1990s is giving way to a new paradigm in the literature. No longer are intangible assets seen as another asset that should be measured by accountants and added to a company's balance sheet under

appropriately revised accounting standards. They are instead seen as a knowledge resource to be used dynamically to create value for a company. Their power lies in their ability to add value, and this power is greater when they are used in innovative and synergistic combinations. The human, structural and relationships capital taxonomy of the old paradigm is being extended to include capabilities and competencies; and intangible asset concepts are becoming integrated into business strategy.

This research has shown that this new paradigm holds out opportunities to gain fresh insights into how business engages with intangible assets in practice.

Company reporting practices have come under close scrutiny internationally in recent years. The growing gap between market value and book value, and the end-of-century internet stock market bubble, raised doubts about the adequacy of company reporting under traditional accounting practices. An explanation has been sought in a better accounting for the potentially very large value creating impact of intangible assets, which are ignored in traditional accounting and company reporting practices. Macroeconomic management variables (e.g., tax and interest rates) have instead been shown to be the drivers of much of the relative growth in the market value gap through the 1980s and 1990s. However, within any particular macroeconomic environment, identifying the role of intangible assets in the creation of each company's future value is important to the capital markets when determining its market valuation. Intangible assets are increasingly important drivers of market values in knowledge-intensive companies benefiting from new information and communication advances.

This research builds on Danish intellectual capital reporting guidelines to develop and test a novel instrument for measuring intellectual capital reporting in New Zealand public companies from this emerging dynamic perspective.

The reporting differences between the 50 sampled companies are explored, and nearly two thirds of the variation is found to be explainable by a combination of differences in profitability, the capital market's perceptions of their future added value, industry differences of tangible asset intensity, company size and company expansion strategies. This potentially

useful outcome is compared with the inconclusive results found in a control survey of intellectual capital disclosure based on the earlier static perspective using a commonly accepted methodology.

The instrument used in this research shows promise to gain insights into intangible asset and value creation disclosure, in a way that facilitates company and international comparisons, and explanatory research.

An inverse relationship is found between tangible asset intensity and the disclosure rating, indicating that knowledge intensive companies are likely to disclose more about their use of intangible assets.

Disclosure policies are shrouded with complexities, such as the conflicting desires for secrecy to maintain competitive advantages and negotiating strengths and for optimistic outlook disclosures to promote increased share values. This research shows a positive relationship between higher levels of value creation strategy disclosure and the future value placed on companies by the capital markets, which suggests there can be rewards in the form of easier access to lower cost capital for credible companies that adopt a strategy of greater disclosure.

Profitability is shown to have an inverse relationship with disclosure, which suggests an unexplored hypothesis that companies disclosing more about their use of intangible assets are also investing more in intangible assets such as advertising, training and research that are expensed under current accounting standards.

Evidence of greater disclosure by larger companies is found; and motivations such as access to capital to support expansionary plans, avoidance of disclosure in competitive industries and factors such as company life cycle are explored.

Although a predictive model is developed that accounts for nearly two thirds of the variation in disclosure between companies, there remains an unexplained variance. This may be attributable to the experimental nature of the measuring instrument, but the arbitrary nature of a voluntary disclosure decision will remain a factor in the variance observed. In the context of

the principles-based reporting guidelines in New Zealand's corporate governance regulatory framework, the findings of this research indicate that a small group of exemplar companies are leading the way towards a more comprehensive voluntary disclosure of their use of intangible assets in their future value creation strategies. There is evidence of a progression of 84% of companies through the four stages of disclosure – narrative, challenges, initiatives and indicators – in the Danish guidelines. This is evidence that the principles-based regulatory approach in New Zealand is working.

6.5 Recommendations

The next logical step from reporting the use of intangible assets to create value is for companies to report their forward-looking expected performance outcomes. Such an annual report could have content similar to that of a prospectus, disclosing management's performance projections justified by an explanation of the business model of value creation strategies. This research shows there is in practice a very low level of outlook reporting by New Zealand companies at present. Most such disclosures are made in generalised qualitative terms. This finding shows that this next disclosure step has yet to be taken. Meanwhile the capital market in New Zealand are being largely left to make their own assessments of the future performance of companies, assisted by those companies that report on their use of knowledge resources to create value. The literature review shows this is how capital markets prefer it, in the face of evidence that the objectivity of company performance forecasts can be undermined by conflicts of interest, and that companies are discouraged by the potential sanctions of litigation and a loss of credibility.

A regulatory requirement to increase outlook disclosure, perhaps in the management commentary accounting standards that are currently under review, would be a vehicle to enforce more disclosure about the use of intangible assets, value creation strategies and performance outlook. It would reduce the perception from outside that the value creation processes overseen by managers within a company are a "black box", and reduce investment

uncertainty. However, this research has shown that companies in New Zealand are already motivated to open that "black box" voluntarily. It suggests that this disclosure is seen by companies as a strategy to attract capital at lower costs, to improve profitability and to grow. The research also shows that most New Zealand companies do recognise there are stakeholder relationship benefits in a disclosure strategy, appropriately balanced by the company's management against the competitive positioning and negotiating strength risks of disclosure. Moreover, the literature indicates stakeholders are sceptical about the value of managers' outlook statements from a game theory point of view, and prefer to make their own informed forward-looking performance judgements. This research provides early evidence that market forces are appear to be working effectively to encourage this development without recourse to additional regulatory enforcement beyond the principles approach that is already being used in the NZSC's *Principles of Corporate Governance*. Time will tell whether the disclosure pattern shown is a trend that continues to develop as more companies follow the lead of the exemplars identified in this empirical research.

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