THE CLARITY OF FULLNESS:

AN EXPLORATION OF THE DISCLOSURE OF UNCERTAINTY IN FINANCIAL STATEMENTS

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The candidate confirms that the work submitted is his own and that approporiate credit has been given where reference has been made to the work of others.

To Proinséas, Seosamh and Margaret

'Only fullness leads to clarity'

(from Schiller's 'Sayings of Confucius')

Abstract

This thesis examines the reporting of uncertainty in financial statements. This is an increasingly important issue for accounting policy-makers as they seek to create financial statements that reflect the substance and economic reality of events in an uncertain world. Several currently proposed disclosures of uncertainty are examined. They comprise the disclosure of the uncertain nature of financial statements and the disclosure of the uncertainty surrounding estimates of assets and liabilities. Drawing on theories of decision-making under uncertainty, the thesis adopts an experimental approach to the exploration of the effect of these disclosures on the perceptions and confidence of users of financial statements.

As a result of its origins in the current context of the reporting of uncertainty, the research findings are pertinent to the development of disclosures of uncertainty. The research finds that the disclosure of uncertainty matters. Moreover, the framing of such disclosure has an effect on perception and confidence. The characteristics of the reporting entity and perceptions of the reliability of financial statement items are also important influences on the impact of such disclosures. The thesis concludes by suggesting that the clear disclosure of uncertainty leads to a fuller view of the reporting entity.

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LIST OF ABBREVIATIONS

AAA	American Accounting Association
AASB	Australian Accounting Standards Board
AcSEC	Accounting Standards Executive Committee of the American Institute of Certified Public Accountants
AICPA	American Institute of Certified Public Accountants
ASB	Accounting Standards Board
ASC	Accounting Standards Committee
ASOBAT	A Statement of Basic Accounting Theory
CICA	Canadian Institute of Chartered Accountants
DCUBS	Dublin City University Business School
FASB	Financial Accounting Standards Board
FRED	Financial Reporting Exposure Draft
FRS	Financial Reporting Standard
IASC	International Accounting Standards Committee
ICAI	Institute of Chartered Accountants in Ireland
ICAS	Institute of Chartered Accountants in Scotland
OFR	Operating and Financial Review
SSAP	Statement of Standard Accounting Practice

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This chapter is the introduction to a thesis which is concerned with the disclosure of uncertainty in financial reporting. The next section, section 1.2, briefly indicates the origins of such concerns. Section 1.3 explores the structure and layout of the thesis. This exploration serves also to describe the development of the research question and hypotheses as well as its design and implementation. Section 1.4 summarises the main findings of the research. Such a summary further accentuates the importance and relevance of the research to the contemporary development of accounting choices in the context of uncertainty. The chapter concludes briefly in section 1.5.

1.2 FINANCIAL REPORTING AND THE IMPORTANCE OF UNCERTAINTY

The focus of this thesis is the reporting of uncertainty in financial statements. In this instance, as chapter 2 will discuss, uncertainty is defined as a lack of information: the difference 'between what is known and what needs to be known' (Mack, 1971, p.1). Financial reporting has been confronted with the problem of uncertainty for several decades. It remains, however, central to the problems currently facing standard-setters and preparers.

Dewhirst (1981) comments on the existence of different 'world views' in financial reporting. One of the differentiating characteristics of such world views is (p. 231) 'the conception of the purpose, role and hence nature and subject matter of public accounting.' Stamp (1980, pp. 124-125), for example, argues that

> accounting is concerned with representation of economic reality . . . 'Economic reality' seems clear enough . . . Yet, when we think carefully about the measurement of the value of this economic reality - the task that is entrusted to accountants - it becomes clear that this is not something that can be done in unambiguous fashion . . . Clearly, measures of economic reality cannot be unambiguous.

Stamp (1980) and Tweedie and Whittington (1990) comment that uncertainty is at the heart of the central problems of financial reporting: problems of recognition and measurement. The ability to recognise an item in financial statements rests on sufficient evidence of the existence of, for example, a benefit (in the case of an asset) and an obligation (in the case of a liability). Furthermore, it also depends on whether that benefit or obligation can be measured with sufficient reliability (ASB, 1995b). Therefore, uncertainty regarding the existence of an item or its measurement may lead to the non-recognition of that item in the financial statements. This research addresses the manner in which such items might be disclosed in the light of uncertainty.

The nature of uncertainty lies not only in measurement and recognition but also in the world itself. Another view of the world, and of accounting within it, is that 'in communicating reality, we construct reality' (Hines, 1988, p. 251). Decision science has also been grappling with such issues: 'disorder, jumble, and confusion from certainty itself' (Townsend, 1992, p.66) and its theories contribute to this research. Bertrand Russell wrote in the introduction to the *History of Western Philosophy* (1961) that modern philosophy's main task is to teach man to live without certainty and yet not be paralysed by hesitation. This thesis attempts to

address, within a behavioural context, some of the issues which arise from financial statements without certainty.

1.3 THE RESEARCH STRUCTURE

This section sets out the layout and structure of the thesis. In doing so, it also indicates the evolution and development of the thesis, its approach to the research problem and the manner in which the thesis deals with the research findings. The next section will explore the main research findings and their implications.

Chapter 2 explores the emerging recogntion of the immutability of uncertainty in financial reporting. This is especially so in the context of the search for economic reality and substance. The chapter then explores the evolution of policies addressing uncertainty in financial statements with a view to drawing from that evolution a framework (in chapter 5) within which the disclosure of uncertainty might be explored. Central to such an exploration is the view that uncertainty is central to financial reporting because uncertainty is characteristic of the human condition and of the world in which financial reporting belongs.

Chapter 3 therefore examines research regarding uncertainty and human behaviour and decision-making. The chapter identifies in particular current theories of decision-making under uncertainty which contribute both to the development of research hypotheses (in chapter 6) but also to the construction of the research instrument (in chapter 7).

Having established a behavioural context for the research, chapter 4 discusses previous accounting research in the context of uncertainty and, in some detail, previous behavioural research in the area. Specifically, the chapter focuses on existing disclosures and potential new disclosures of information regarding uncertainty. The chapter contributes to an appreciation of the research question, the approach to that question and, further, to the unique policy-driven, contemporary nature of the thesis.

Having established the relevance of the research (in chapter 2), its behavioural context (in chapter 3) and previous research in the area (in chapter 4), chapter 5 identifies the proposed research approach. The approach adopted is experimental. Drawing on policy proposals in chapter 2 and their potential behavioural effects introduced in chapter 3, chapter 5 sets out the framework within which the disclosure of uncertainty is tested. This concerns, first, the disclosure of the uncertain nature of financial statements as suggested, for example, by Boritz (1990) and the Cadbury Report (The Committee on the Financial Aspects of Corporate Governance, 1992). It also concerns the disclosure of uncertainty regarding specific significant estimates in financial statements as proposed, for example, by the Accounting Standards Board ('ASB') (ASB, 1995b; 1997b). Prompted by the ASB's suggestions, these disclosures are three-fold. Uncertainty of recognition in financial statements stems from the uncertain occurrence and the uncertain outcome of an event. The first disclosure reveals the existence of such an uncertainty (leading to a potential loss), the second establishes an estimated range of probability for the occurrence of the event while the third discloses the range of potential outcomes should the loss occur. Drawing on the asymmetric treatment in financial reporting of assets and liabilities, these disclosures are examined in the context of both assets (stock) and liabilities (provisions). They are also explored in the light of reporting entities with differing characteristics (revolving around the level of debt and the trend of turnover).

The outline of the research approach in chapter 5 allows chapter 6 to develop the specific hypotheses of the research given the broad research question identified and explored in chapters 2, 3 and 4. These hypotheses state that the disclosures outlined in chapter 5 will affect the assessments of performance and position of the reporting entities by the experimental subjects. Further, the expressions of confidence in those assessments by the experimental subjects are examined. The hypotheses also suggest that the effect of the disclosures will differ in the light of the characteristics of the reporting entities. Differences between the impact of the disclosure of uncertain assets and uncertain liabilities are also hypothesised. It is also hypothesised that expectations of the reliability of financial statements and of the reliability of elements of financial statements have a role in fashioning the potential

effect of, first, the disclosure of the uncertain nature of financial statements and, second, the differences between the disclosure of uncertain assets and uncertain liabilities.

Having established the research approach and the research hypotheses in chapter 5 and 6 respectively, chapter 7 discusses the construction of the research instrument which will test the hypotheses outlined given the research approach. It also indicates the pilot-testing of the research instrument and the initial findings and refinements of the instrument based on such pilot-testing.

Chapters 8 to 10 outline the main findings of the research in detail. Chapter 8 is concerned with the disclosure of the uncertain nature of financial statements, chapter 9 with the disclosure of the uncertain nature of assets and chapter 10 with the disclosure of the uncertain nature of liabilities. Chapter 11 deals with a by-product of the research question: the effect of the characteristics of the experimental subjects (particularly gender and experience) on their assessments of performance and position of the reporting entities and on their expressions of confidence in those assessments.

Each chapter (of chapters 8 to 11) outlines in some detail the research findings specific to that chapter. The next section, section 1.4, summarises in broad terms the main findings of the research and their implications for accounting policy-makers. The concluding chapter, chapter 12, examines the implications of these findings in more detail.

1.4 THE RESEARCH FINDINGS: A SUMMARY

This section constitutes a summary of the main research findings discussed in more depth and in broader terms in chapters 8 to 11. It also serves to accentuate at the outset the importance of this research to policy-makers in the current context of financial reporting. The main findings of the research may be summarised, in brief terms, as follows:

- Uncertainty matters.

It has emerged from this research that the disclosure of uncertainty, the revelation of what is not recognised in financial statements due to insufficient evidence of existence or value, matters. Specifically, the disclosure of additional information concerning a remote event whose outcome is inestimable has an effect on the perceptions and confidence of decision-makers. The concern of accounting policy-makers (such as the ASB, the Canadian Institute of Chartered Accountants ('CICA') and the Accounting Standards Executive Committee of the American Institute of Certified Public Accountants ('AcSEC') and others (such as Boritz) with uncertainty therefore appears warranted.

- The framing of the disclosure of uncertainty matters.

The manner in which uncertainty is revealed and discussed has differing effects on perceptions and confidence. In particular, the quantification of the estimated range probability of occurrence of an uncertain event had a marked effect on the assessments and confidence of the experimental subjects. This finding has implications not only for how uncertainty might be disclosed but also for when disclosure might occur. This finding is discussed in more detail in section 12.3.1.

- Expectations of reliability matter more than assets and liabilities *per se*.

The research finds that initial expectations of the reliability of financial statement items fashion subsequent reaction to the disclosure of uncertainty. This is particularly so in the context of the disclosure of the uncertain nature of financial statements in general (outlined in chapter 8) and in the differing reactions to the disclosure of uncertain assets and liabilities (explored in chapter 10). Hence, the role of the disclosure regarding the uncertain nature of financial statements in particular may be to educate users of financial statements of the character of those financial statements rather than to inform them of the reporting entity.

Furthermore, assets are generally perceived as being less reliable than liabilities. Reaction to the disclosure of uncertain assets and liabilities appear to derive from prior expectations of reliability rather than from perceptions of assets and liabilities as assets and liabilities. This finding is discussed in more detail in sections 10.4.2 and 12.3.3.

- The characteristics of the reporting entity matter.

A consistent finding in the context of each disclosure is that the characteristics (in particular the extent of debt) of the reporting entities appear to effect the relative importance attached to each disclosure. As a result, the research suggests that considerations of materiality and disclosure policy should consider (as the ASB, 1995b suggests) the context of the uncertainty as well as its significance in terms of size or incidence.

1.5 CONCLUDING REMARKS

This chapter has outlined the research question and its relevance to financial reporting as it enters the twenty-first century. That relevance is created by an increasing concern that financial statements should be useful and should report, in some form, the substance of the events which fashion the performance and position of the reporting entity. The research remains relevant by focusing on contemporary suggestions in the evolution towards the disclosure of uncertainty in financial statements. By doing so, the research reveals a number of issues which are important in the continuing development of such disclosure. The chapters that follow set out the historical, current and behavioural background to such issues and the manner in which these issues are unveiled.

CHAPTER 2

UNCERTAINTY AND FINANCIAL STATEMENTS

2.1 INTRODUCTION

This chapter, which is in three main sections, examines in detail the relevance of research on uncertainty in the context of financial statements. It does so in two ways: first, in Section 2.2, by discussing how uncertainty influences the decisions of the stakeholders of the reporting entity. Secondly, Section 2.3 explores the central concepts and boundaries of financial reporting in the light of uncertainty. The final section, Section 2.4, examines how financial statements and / or annual reports might more adequately reflect such uncertainty. Chapters 6 and 7 will draw on this section to form a specific framework of the reporting of uncertainty within which the thesis will proceed.

A number of recent accounting publications and pronouncements have concerned themselves with the disclosure of risk and uncertainty in financial statements and/or annual reports. The Cadbury Report (Committee on the Financial Aspects of Corporate Governance, 1992) and the Auditing Practices Board's *The Future Development of Auditing - A Paper to Promote Public Debate* in the

United Kingdom (APB, 1992), the Financial Reporting Commission in Ireland (1992), the MacDonald Commission in Canada (CICA, 1988) and, in the US, the *Proposed Statement of Principle: The Disclosure of Risks and Uncertainties and Financial Flexibility* of the AcSEC (AcSEC, 1993) all argue, to a differing extent and with differing success, for increased consideration of uncertainty and risk in the context of financial reporting.

Uncertainty is what Keynes (1933, p. 339) terms 'part of our human outfit' . . . 'an essential element of our human condition' (Tversky, 1989, p. 148). Freear (1977), tracing the history of accounting, notes that one of the factors leading to the expansion of accounting was the increased complexity and uncertainty of business. Hendriksen (1977, p. 128) describing uncertainty as a 'measurement constraint', contends that 'uncertainty in accounting arises from two main sources': the allocation of amounts between past and future periods and the measurement of wealth which requires the estimation of future uncertain amounts.

The primary motivation for examining how financial accounting might grapple with uncertainty is that it is interesting. It is interesting not only to this author but also to the discipline. That this is the case is well-illustrated by drawing on a number of arguments put forward in a 1990 journal article by Tweedie and Whittington (T&W). Echoing Hendriksen, T&W (1990, p. 91) classify the current problems of financial reporting under 'two conventional headings: recognition problems and measurement problems.' They go on to observe (p. 98) that uncertainty is an issue affecting both of these problems: 'uncertainty affects not only *whether* an item is recognised in the accounts, but also *how* it is recognised.' Ironically, therefore, while accounting grew out of complexity and uncertainty, complexity and the resulting uncertainty are central to the challenges facing accounting in an environment which has 'become more complex and competitive'. (Zeff and Keller, 1985, p. 460)

T&W (1990, p. 91) outline what they see as the broad consensus regarding the purpose of financial reports. One of these broadly agreed notions about financial reports is that they are intended to provide users with information for decision making. Users are defined broadly by the ASB (1995b). They include, for example, employees, those in the environment of the reporting entity,

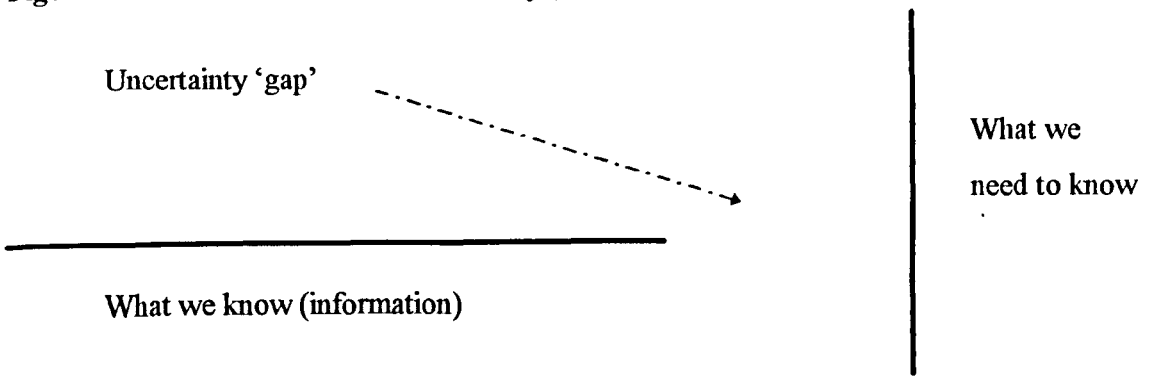
customers and the public.

If one defines accounting as a discipline that is concerned with information and with informing decision makers, (ASB, 1995b) the influence of uncertainty on the discipline is clear. Arguing that there is broad agreement that financial reports should provide information to users, T&W comment that users seek 'economic relevance.' While noting that the ICAS group (McMonnies, 1988) 'bravely pins its faith in identifying economic reality', T&W continue that 'economic reality' carries with it connotations that are 'inappropriate in a realistic setting of uncertainty.' This finds echoes, though not exact parallels, in Stamp's argument (1980) that as economic reality is complex and ambiguous, its presentation in financial statements cannot be unambiguous. It seems that to be useful in decision making, information must represent some form of what has variously been termed 'substance' or 'reality' but that in doing so accounting information must struggle with the uncertainty or ambiguity of that substance.

Uncertainty, then, is central to financial reporting. Users are concerned with uncertainty. They are also concerned with 'economic relevance', which in an uncertain world, is uncertain. The problems of financial accounting have uncertainty as a common theme. This is hardly surprising as accounting is a human activity and uncertainty is what Keynes terms (1933, p. 339) 'part of our human outfit.' What is ironic is that while accounting exists because of uncertainty, it is also constrained because of uncertainty. Research in this area is therefore interesting in a discipline that struggles with uncertainty. It leads one to wonder whether the role of accounting is not to eliminate but to illuminate uncertainty, whether there is a certainty surrounding single numbers and whether that is financial reporting's strength or its weakness.

A compelling and pithy definition of uncertainty is provided by Mack (1971, p. 1) who comments that 'uncertainty . . . is the gap between what is known and what needs to be known.' This 'gap' is illustrated in Figure 2.1 and will be developed in chapter 6 (specifically in Figure 6.2) to establish some of the hypotheses of this research.

Figure 2.1: Mack's definition of uncertainty (after Mack, 1971, p. 1)



Mack's definition of uncertainty finds an echo in financial reporting: Boritz (1990, p. 44) comments that 'uncertainties [in the use of financial statements] may arise from reliance on information which is incomplete': in grappling with uncertainty, financial reporting grapples with the gap between what the user knows and what the user needs to know. Such uncertainty is included in the category of information uncertainty by Boritz and is discussed in Section 5.2. At this stage, however, one is led to consider what the American Accounting Association (AAA, (1973, p. 63) termed 'the behavioural interactions of the accounting data and the decision maker', what May and Sundem (1976, p. 760) describe as the 'black box' which links 'accounting outputs to aggregate market consequences.'

2.2 UNCERTAINTY AND THE DECISIONS OF STAKEHOLDERS

'No sentient entity', write Crowe and Horn (1967, p. 466), 'can exist in a totally 'riskless' reality. As long as an entity has wants, its capacity to satisfy these wants is in jeopardy. The aspects of reality which may lead to loss are countless.' Risk not only exists because of wants but also because of the converse: a lack of resources to achieve those wants (Doderlein, 1987, p. 6). Likewise, uncertainty is defined in the light of Figure 2.1 as a lack of information to make informed decisions.

Discussing risk on the basis that risk is 'the possibility that a sentient entity will incur loss', Crowe and Horn (1967, pp. 462 and 465), wonder: 'Can a corporation be considered as a sentient entity capable of wanting?' Quite apart from the legal recognition of the body corporate, Crowe and

Horn conclude (p. 465) that

> if a group entity is composed of individual sentient entities, then the composite of the wants of these constituent entities can be regarded for purposes of convenience as the 'wants' of the group entity.

Any consideration of uncertainty in a financial reporting context, cannot avoid considering therefore:

a) who are the constituent entities or stakeholders of the entity? and

b) what are their information needs?

2.2.1 The constituent entities or stakeholders of the reporting entity

The stakeholders of the modern organisation are the groups who are affected by or *can affect* the organisation (Freeman, 1984, p. 1). Freeman includes within the stakeholders of the modern organisation not only its owners but customers, employees, suppliers, governments, competitors, consumer advocates, environmentalists, other special interest groups and the media. The APB's *The Future Development of Auditing - A Paper to Promote Public Debate* (APB, 1992) urges the extension of the perspective of financial statements to include all these stakeholders of the reporting entity.

The users of accounting information defined by the ASB are similalrly wide-ranging. The ASB (1995b, p. 36) include present and potential investors, employees, lenders, suppliers and other trade creditors, customers, governments and their agencies and the public as among the users of financial statements. These users have also been recognised by ASOBAT (1966), The Trueblood Report (AICPA, 1973), and The Corporate Report (1975) among others. As a result, the users of financial statements are a diverse group. The ability of financial statements alone to meet the information needs of such users is limited giving rise to uncertainty itself and to the use of various other sources of information by users (Lee and Tweedie, 1977 and 1981; Baker and Haslem, 1973).

Indeed, the very objective of financial statements is limited by the ASB to the provision of

'information about the financial position, performance and financial adaptability of an enterprise that is useful to a wide range of users assessing the stewardship of management for making economic decisions [my emphasis].' (ASB, 1995b, p. 35) This objective of financial statements is narrower than, for example, the twelve objectives set out by the Trueblood Committee (AICPA, 1973). As a result, a distinction must be drawn between

1. risks and uncertainties which have an impact on the reported financial performance and position of the reporting entity (which the financial statements give information about) and
2. those risks and uncertainties which affect the relationship, perceived and real, between the entity and its stakeholders.

This research, drawing on the definition of uncertainty explored in Figure 2.1 and the defined objectives of financial statements, focusses on the first of these elements of uncertainty: the uncertainty attaching to the recognition and disclosure of the financial performance of the reporting entity. The ASB (1995b) characteris es shareholders as the primary user of financial statements and also argues that the needs of other stakeholders are served through the satisfaction of the needs of shareholders. Section 2.2.2 illustrates this view (in the instance of this research), outlining in particular the needs of shareholders in the context of uncertainty. Similarly, the research as it develops in this and later chapters concentrates primarily on shareholders' perceptions of the reporting entity. Section 2.3 explores in more detail the problems faced by financial statements in addressing uncertainty while section 2.4 outlines proposals to address these problems.

2.2.2 The wants of stakeholders in the context of uncertainty

The information needs of users has been widely researched using a number of different approaches (see for example Wolk, Francis and Tearney, 1984, p. 188). Figure 2.2 summarises the ASB's discussion of the needs of these users, with a particular emphasis on their need for information concerning risk and uncertainty. The following subsections (2.2.3 to 2.2.6) analyse each of these in turn particularly in the context of the reporting of the financial position and performance of the reporting entity before section 2.3 explores the challenge uncertainty poses for accounting policy-makers.

Figure 2.2: Users and their information needs

CATEGORY OF USER:	NEED INFORMATION CONCERNING:
Investor	• Risk inherent in, and return provided by, investment • Ability of enterprise to pay dividends • Performance of management
Employees and their representatives	• Stability and profitability of their employer • Health and safety in employment • Ability of the enterprise to provide adequate remuneration, retirement benefits and satisfying employment opportunities
Lenders	• Ability to pay loans and interest when due
Suppliers and other trade creditors	• Ability to pay amounts owing when due
Customers	• Going concern of the enterprise (especially when they have a long-term involvement with, or are dependent on, the enterprise)
Government and their agencies	• Activities of the enterprise • Regulation, taxation policies, collection of statistics
Public	• Trends and recent developments in the prosperity of the enterprise and (for example) the range of its activities, environmental impact of the entity's processes and products

2.2.3 Uncertainty and the information needs of shareholders

The owner or shareholder has traditionally been regarded as bearing the greatest risk in a business entity. 'The risk [the shareholders] bear justifies their exercising the decisive influence over the running of the company by appointing the management' (Stahl, 1976, p. 174 (quoted in Jonsson, 1978)). The owner, unlike others, is only entitled to the residue of net assets (the 'ownership interest'). When times are bad, the owner suffers first; conversely in the good times, the owner reaps the reward. The owner is, therefore, most exposed to and most interested in uncertainty and the impact of that uncertainty on the entity.

The concern with risk in the general context of investment decision-making finds its origins in the work of Markowitz (1952 and 1959) and is supported by the Efficient Market Hypothesis developed by Fama (1965, 1970) Markowitz prescribed that investors value a portfolio of shares based on two dimensions - return (amount) and risk (potentially measured in a variety of ways). He further demonstrated that investors could maintain the same return on their portfolio but reduce the risk attached to that portfolio by diversifying into shares whose expected returns are not closely correlated with returns on their existing portfolio. Markowitz's seminal arguments were followed by numerous extensions and refinements (e.g. Tobin, 1958; Sharpe, 1964, 1970; Fama, 1965, 1968; Lintner, 1965). Sharpe (1964, p. 427), in developing a theory of market equilibrium in conditions of risk, assumed 'that an individual views the outcome of any investment in probabilistic terms; that is, he thinks of the possible results in terms of some probability distribution. In assessing the desirability of a particular investment, however, he is willing to act on the basis of only two parameters of this distribution - its expected value and [for example] its standard deviation.'

Shortly after the promulgation of this theory, research papers concerned with market-determined and accounting-determined risk measures appeared in the academic literature (e.g. Beaver, Kettler and Scholes, 1970; Breen and Lerner, 1973; Gonedes, 1973; Lev, 1974; Lev and Kunitzky, 1974; Bildersee, 1975). Several accounting variables were found to be indicative of the market's perception of the risk of an entity, including earnings variability and volatility, the size of the entity,

its growth and its financial and operating leverage. These measures of uncertainty will be utilised in the characterisation of the reporting entities which comprise part of the research instrument developed in chapter 7.

A Committee of the AAA asserted (AAA, 1972, p. 410) that 'at the level of the individual investor who faces a given set of security prices, the role of information is to aid in the selection of the optimal portfolio of securities' and also 'that the role of accounting data becomes its predictive ability with respect to *beta.*' (p. 424) Beaver (1973, p.55) extended this argument saying that 'in an efficient market, the usefulness of financial statement data to individual investors is not to find mis-priced securities, since they are nonexistent. What then is the value, if any? The value lies in the ability of financial statement data to aid in risk prediction.' While arguing that the investor is concerned with assessing risk as well as return, Beaver's contention appears to suggest that risk is the fundamental variable of concern to investors:

> Many portfolio managers and their clients have moved away from a 'beat-the-market', high-turnover philosophy to one where the emphasis is placed upon risk management and the minimisation of operating costs (p.52).

Mumford (1989, p. 385) states the case in starker terms:

> In the light of modern capital market theory, maybe shareholders want or need nothing more by way of formal financial reports than the latest 'bottom-line' earnings figure and a statement of the company's *ex post* market 'beta' and *ex ante* target 'beta' independently monitored.

These propositions are not new. Knight (1921, Chapter 9) argued that profit is the reward of uncertain enterprise. More recently Bhide and Stephenson (1992, p. 194) write that 'business owners . . . underwrite investments where the historical record provides little basis for predicting outcomes and the payoff functions are truly uncertain.'

Outside the context of the capital market and the publicly-quoted company, Griffin (1982, p. 42) argues that 'for investors who are not well-diversified information about company specific risk is

paramount.' Kripke (1979), while suggesting that shareholders should seek to diversify (which 'limits the usefulness of individual security disclosures' (p. 92)), argues that financial reporting has a responsibility to the non-diversified as well as the diversified shareholder. Furthermore, Dyckman, Downes and Magee (1975, p. 90) write that

> a substantial number of individual investors are not well-diversified, and there is no *a priori* reason to assume such behaviour irrational, particularly if the world is not adequately reflected by the simplified economic models which support the EMH. Under such conditions good information concerning risk takes on increased importance if investors are to minimise transaction costs while retaining their desired portfolio strategy involving risk and return.

2.2.4 The employee as stakeholder

In assessing the hierarchy of risk-takers within and without the reporting entity, the shareholder has, as has been noted, been perceived as the primary risk-taker, at least in financial terms. However, employees of a company 'can in fact be assumed to have a very considerable interest indeed in the company being run in a way that reduces to a minimum the risks' taken by them (Jonsson, 1978, p. 377). Employees may of course be shareholders directly or indirectly (Briston and Dobbins, 1978; Drucker, 1980) and have an owner's interest in the risk of the entity. Jonsson (p. 374), however, has identified some of the risks borne (if not taken) by employees as employees:

1. The risk of damaging health whilst working,
2. The risk of becoming unemployed due to a company's closure and
3. The risk of being forced to move [in search of employment] from a locality where there is a permanent shortage of job vacancies.

While these risks are not entirely financial, they are no less profound than the risks of shareholders. It could be argued, in fact, that the risks faced by employees are more profound than those faced by shareholders. If (as Doderlein (1987) points out) risk remains because of a lack of resources, employees' resources may be more limited, or at least less mobile, than those of owners.

Circumstances may render employees dependent on the individual entity: employees cannot normally vest their employment in a number of entities and therefore cannot normally diversify. In the latter part of the 20th Century (if not through history), labour is in oversupply while capital remains in demand. In particular, the currency of labour, its skills, are less mobile and more specific than the monetary currency of capital - this stratification of the labour market is good for some and bad for others.

The risks faced by employees do however imply uncertainty for shareholders as well. These implications arise from some of the risks borne by employees:

1. the employee's risk of damaging his/her health while working may result in liabilities to the reporting entity in the form of litigation awards and/or increased insurance premiums and a requirement under legislation to render the workplace safer;
2. the employee's risk of becoming unemployed due to a company's closure may result in increased redundancy payments and, therefore, less net assets available for ultimate distribution to the owners, and
3. the skills stratification of the workforce implies that the reporting entity must pay a premium to attract employees whose skills are in short supply. Such a premium is not a risk premium but a function of the market, although obviously a consideration of the prospective employee whose skills are in short supply is the risk of the employment for which he/she may demand compensation.

2.2.5 Lenders, creditors and customers as stakeholders

In the context of the decision to grant credit,

> the use of financial analysis [of financial statements] basically comes down to a decision on whether or not the customer can pay in the future. Financial statements divulge trends in the business and help credit managers in their decision-making process. (Cole, 1984, p. 404)

The decisions made by lenders and creditors using the information contained in financial statements are divided by Staubus (1977) into two groups: the basic, lend or not lend decision and the

secondary decisions such as security, restrictive covenants, interest rates and maturity dates. Included among those secondary decisions of lenders is the creation and enforcement of the terms of a loan and, ultimately, the possible liquidation of the entity. The implications of such decisions are generally no less dramatic than the decisions of investors. They also create risks of their own by affecting the gearing and interest cover of the entity, its ability to finance growth and ultimately, perhaps, its survival.

The interests of customers are similar to those of suppliers: 'the continuance of an enterprise, especially when they have a long-term involvement with, or are dependent on, the enterprise.' (ASB, 1995b, p. 37) As the uncertainty faced by these customers is similar to that faced by lenders and creditors, the type of information usefully disclosed is the same for lenders as for customers. (Customers will also be interested in information useful in for example price negotiations, as well as uncertainty surrounding product quality and customer care. This kind of information does not relate to financial statements *per se* and is therefore not considered here.)

2.2.6 Uncertainty and other stakeholders

Other stakeholders of financial statements comprise the public, governments and their representatives as well as competitors of the entity. 'Enterprises may make a substantial contribution to the local economy.' (ASB, 1995b, p. 37) They may also have a significant impact on the local, national or international environment and the safety of consumers. A feature of the involvement of others as stakeholders is the involuntary nature of such an involvement and, often, the absence of a reward attached to the risk of involvement. The local community as a community (rather than as, say, employees) is often affected involuntarily by an entity purely by being its neighbour. They have little influence over the entity yet can be influenced by the activities of the entity more than any other user. Douglas (1985) and Rowe (1977) argue that such involuntary, often powerless, users have legitimate rights, in justice, to information concerning a neighbouring entity. Rescher (1983, p. 167) develops the argument further: 'the course of recent development has seen the gradual evolution of a 'right to know' when one is being put at risk.'

This 'right to know' could be extended to accounting. Bedford (1974, pp. 13-14), for example, remarks on 'the rampant surge of the 'public right to know' doctrine' in accounting. It has parallels in the doctrine of 'informed consent' in the consideration of medical negligence set out in Walsh v. Family Planning Services Limited:

> Where there is a risk, however exceptional or remote, of great consequence involving severe pain stretching for an appreciable time into the future and involving future operative procedures, such possible consequences should be explained in the clearest language to the prospective patient. (*Per* O'Flaherty and Egan JJ; Hederman concurring in Walsh v. Family Planning Services Limited, *The Irish Law Reports*, 1992, p. 497)

Interestingly, considering the lack of influence of some other users over the reporting entity, the duty to inform in a medical context is less when the procedure is not elective, when the user has less influence, less choice. This makes practical sense in a medical setting. However, the accountants' conceptual framework, write Gray, Owen and Maunders (1987, p. 73) is 'ill-equipped . . . to cope with the broader social dimension.' The next section discusses how accounting currently copes with the broad dimensions of uncertainty.

2.3 UNCERTAINTY AND FINANCIAL STATEMENTS

Having identified the uncertain nature of financial statements and the uncertain nature of the reality of stakeholders, this section explores in more depth the uncertainty surrounding accounting numbers and, further, how such uncertainty is currently dealt with in financial statements. One of the central themes of the introductory section of this chapter which is elaborated on in this section is that both uncertain occurrences and outcomes are the stuff of uncertainty in the context of judgment, recognition and disclosure in accounting. These uncertain outcomes and occurrences are created and circumscribed by the risks of the business in which the reporting entity operates. This section (Section 2.3) explores these issues in more depth in an effort to establish in the next section (Section 2.4) a framework within which uncertainty might be disclosed in financial statements.

Morgenstern (1960, p. 74) classifies the figures produced by financial statements as

a) figures recording possession or handling of monies (cash or cash equivalents) and
b) figures involving valuation 'which are necessarily the outcome of theories, opinions, conventions, traditions, examples set by others etc.'

Figures in Class a), he argues, will generally be available to a high degree of accuracy, while figures in Class b) require 'a sale and transaction before they assume the monetary form given them in the accounts'. The balance sheet, he continues, is in the form of 'layers' of uncertainty with differing levels of uncertainty attaching to each layer. This particular characterisation of the balance sheet leads to a suggestion regarding the presentation of the balance sheet which will be discussed in section 2.4. It also serves, however, to focus on the nature of uncertainties regarding each component of the conventional balance sheet as set out in Figure 2.3 (adapted from Pratt (1982, pp. 200-260)). As equity is the residual of assets and liabilities (ASB, 1995b, p. 61) and 'all other elements of financial statements (such as revenues, expenses, gains and losses, etc.) are defined in terms of changes in assets and liabilities' (Johnson, 1994, p. 2), the uncertainty affecting assets and liabilities have implications for all those other elements of financial statements.

One common aspect of the assets and liabilities depicted in Figure 2.3 is that their very definition (and existence) as future benefits and future obligations respectively depend on the occurrence and outcome of future events. Defining assets as rights or other access to future economic benefits controlled by an entity as a result of past transactions or events and defining liabilities as obligations to transfer economic benefits as a result of past transactions or events (ASB 1994a, p. 9) renders their very existence dependent on an uncertain future event and creates doubt in financial statements.

Figure 2.3: The Components of the Balance Sheet and Their Related Uncertainties

BALANCE SHEET CAPTION	SOURCES OF UNCERTAINTY
Fixed Assets	Existence[1]; nature and classification; beneficial ownership; cost, particularly in the case of self-produced assets, intangible assets etc.; value to the business; ultimate and current realisable value and / or market value; useful life (and resulting period of depreciation / amortisation); obsolescence; appropriateness of capitalisation (e.g. in the case of intangibles, leases etc.) which may depend on, among other factors, the ultimate recovery of cost (e.g. research and development) or economic substance (e.g. leases).
Stock	Existence[1]; beneficial ownership; appropriate recognition; stage of completion (for presentation but also recognition in the case of e.g. long-term contracts); cost; net realisable value; obsolescence.
Debtors and Prepayments	Existence[1]; appropriate recognition; timing and amount of ultimate recoverability in cash (including foreign currency amounts).
Cash	Existence[1]; in the case of foreign currency amounts, amount of ultimate realisation in the currency of the entity.
Creditors, accruals and provisions[2]	Existence; appropriate and complete recognition; timing and amount of ultimate obligation (including amounts in foreign currencies); appropriate classification.

[1] 'Evidence that an entity has rights or access to benefits (and hence has an asset) is given if the entity is exposed to the risks inherent in the benefits, taking into account the likelihood of those risks having a commercial effect in practice' (ASB, 1994, para. 17)

[2] The accounting basis for the creation of provisions for future events is discussed in Johnson (1994).

According to Mock and Vertinsky (1985, p. 6) doubts about data in accounting may be admitted or ignored based on shared rules of the language of accounting. Such shared rules include notions such as consistency and professional consensus and are formed by accounting standards and GAAP. Indeed, the existence of accounting standards should help in guiding the treatment of complex events, contribute to uniformity and comparability and, in that sense, reduce uncertainty.

One of the first standards of the ASC, SSAP 2 *Disclosure of Accounting Policies*, set out four 'fundamental accounting concepts' which, it stated, 'are the broad basic assumptions which underlie the periodic financial accounts of business enterprises' (ASC, 1971, para. 14). One of these concepts was 'prudence' which the ASC (1971, para. 14) defined in the following terms:

> revenue and profits are not anticipated, but are recognised by inclusion in the profit and loss account only when realised in the form either of cash or of other assets the ultimate cash realisation of which can be assessed with reasonable certainty; provision is made for all known liabilities (expenses and losses) whether the amount of these is known with certainty or is a best estimate in the light of the information available.

These fundamental concepts, the ASC (1971, para. 14) argues, 'are regarded as having general acceptability'. They had evolved as ideas underpinning the practice of financial reporting before the issue of SSAP 2 and have undergone further development since.

The adoption of a conservative or prudent approach to recognition was essentially a way of dealing with uncertainty (Moonitz (1961), Rappaport (1973)). The AICPA (1970, p. 9089) classified 'conservatism' as a constraining principle in its APB Statement 4, arguing that such 'modifying conventions . . . have evolved to deal with some of the most difficult and controversial problem areas in accounting.'

Sterling (1967) called conservatism the dominant principle of accounting. Several writers have considered the source of conservatism. Littleton (1941), for example, argues that 'lower-of-cost-or-market' has its origins in the desire to minimise stocks for tax purposes. Wolk, Francis and Tearney (1984, p. 121) suggest that conservatism or prudence arises from the conflict between

accountants and optimistic clients. They go on to comment (p. 121), however, that 'as the conceptual foundations of accounting change in accordance with new theoretical approaches, it is quite likely that conservatism, as a dominating principle, will decline in importance'.

Within the ASB's draft *Statement of Principles*, the ASB (1995b) recognises that prudence is a reaction to uncertainty: 'uncertainties are recognised by the disclosure of their nature and extent and by the exercise of prudence in the preparation of financial statements' (p. 46) and that (p. 81) 'the application of prudence may mean that a potential loss (and any related liability) subject to uncertainty of measurement should be recognised at an amount higher than [a] minimum amount' that is reasonably assured.

The ASB's draft Statement conversely marks an evolution of the description of prudence to the extent that it cautions (p. 46) that 'the exercise of prudence does not allow . . . the creation of hidden reserves or excessive provisions, the deliberate understatement of assets or income, or the deliberate overstatement of liabilities or expenses'. While this was hardly ever the intention of the broad concept of prudence, in its application it had resulted in '(1) slower revenue recognition, (2) faster expense recognition, (3) lower asset valuation, (4) higher liability valuation' (Wolk, Francis and Tearney, 1984, p. 121).

The concept is refined and defined by the ASB (1995b, p. 46) as:

> the inclusion of a degree of caution in the exercise of the judgements needed in making the estimates required under conditions of uncertainty, such that income or assets are not overstated and expenses or liabilities are not understated.

Such an asymmetric approach to the recognition and measurement of gains and losses is reflected in SSAP 18. One of the accounting standards specifically dealing with uncertainty is SSAP 18 *Accounting for Contingencies.* The Standard applies only 'to conditions existing at the balance sheet date, where the outcome will be confirmed only on the occurrence or non-occurrence of one or more uncertain future events' (ASC, 1980, para. 1). SSAP 18 defines and discloses uncertainty

on a narrow basis by requiring the accrual or disclosure of a single reasonably accurate measure or (where the amount is not estimable) alternatively the disclosure of the contingency and its related uncertainty with no estimate of outcome. The Standard applies layers of disclosure, prudently prescribing a different treatment for gains and losses, as set out in Figure 2.4.

FRED 14: *Provisions and Contingencies* (which would revise SSAP 18 if implemented) comments (ASB, 1997b, p. 15) that 'the concept of prudence requires stronger evidence for recognising a gain than a loss and often results in a loss (and any associated liability) being recognised where a gain (and any associated asset) would not be recognised'.

Figure 2.4: SSAP 18 and uncertainty.

Outcome	**Likelihood of occurrence**	**Accounting treatment**
Loss	Virtually certain	Recognise
	Probable	Recognise
	Not probable but not remote	Disclose
Gain	Virtually certain	Recognise
	Probable	Disclose
Loss / gain	Remote	Do not recognise or disclose

This approach to recognition would appear to imply that decision-makers would react differently to contingent gains and losses or contingent assets and liabilities: that decision-makers would like to see contingent losses recognised sooner than contingent gains or contingent assets to be firmer than contingent liabilities. This research will avoid the distinction between gains and losses for the reasons identified in a behavioural context in chapter 3. It will, however, attempt to assess whether decision-makers react differently to information concerning uncertain assets and uncertain liabilities. Perceptions of the reliability of particular asset and liability items will be discussed. The role of such perceptions in forming assessments of performance and position given the disclosures outlined will also be examined. Chapter 6 will develop research hypotheses in this context. Chapter 10 will draw on these hypotheses to examine differences in decisions arising from the

disclosure of uncertain assets and liabilities.

More recently, the dual nature of uncertainty is recognised by the ASB (1995b, p. 68) in its draft *Statement of Principles* which states that 'recognition is triggered where a past event [realisation / occurrence] indicates that there has been a measurable change [outcome] in the assets or liabilities of the entity.' The ASB (1995b, p. 67) outlines the criteria necessary to allow recognition of an asset or liability in financial statements:

> if:
>
> (a) there is sufficient evidence of the existence of the item (including, where appropriate, evidence that a future inflow or outflow will occur); and
>
> (b) the item can be measured at a monetary amount with sufficient reliability.

In other words, only when there is adequate (but not necessarily conclusive) evidence of a transaction or event can the impact of that transaction or event be recognised in the financial statements. However, unlike the ASC in SSAP 18, the ASB (1995b, p. 78) concedes that where assets and liabilities cannot be estimated with sufficient reliability the disclosure of 'the significant assumptions used, the range of possible outcomes, the basis of measurement and the principal factors that affect what the outcome will be' is necessary.

Tweedie and Whittington (1990, p. 91) note that 'a theme which pervades [the recognition problems faced by financial reporting] is that of uncertainty about future events and how to deal with it.' Recognition, therefore, is dependent on evidence concerning both *past* and *future* events:

> Certainly the accountant cannot entirely escape the need to recognise current and future conditions; every decision to carry forward an amount as an asset instead of an expired cost necessarily turns on future conditions. (Vatter, 1966, p. 84)

2.3.1 Uncertainty of events and the recognition of events

As a result, events, are the key to recognition. The critical aspect of the event is not only its occurrence but the ability to extract from it sufficient evidence regarding the impact of the event on

the financial position of the entity to allow it to be recognised on a reliable basis. 'Recognition is triggered where a past event indicates that there has been a measurable change in the assets or liabilities of the entity.' (ASB, 1992b, para. 9) Uncertainty affects recognition in two ways: uncertainty as to the occurrence of an event and uncertainty as to the impact of such an occurrence on assets and liabilities.

Arising from these tests of recognition, what constitutes sufficient evidence to allow recognition of an asset or liability is itself uncertain. The consideration of the issue is 'nothing more than the intelligent application of a definition' (Sterling, 1985, p.43). This would particularly apply to the judgment-based assets ('Class b')) of Morgenstern's layered balance sheet. The probability of the occurrence and/or outcome of an event is central to such a consideration:

> A well formed definition connects a symbol (word or numeral) with phenomena. It provides criteria that allow one to decide whether a particular phenomenon is or is not within the ambit of the definition. It partitions phenomena into two classes: those that satisfy the criteria and those that do not. (Sterling, 1985, p. 43)

That the occurrence of the event is 'probable' comprises part of the recognition criteria of the AASB (1992), ASB (1992a, 1995a, 1995b), CICA Handbook, IASC (1994) and part of the definition of assets of the FASB (1984 and 1985). FRS 5 (ASB, 1994a) uses the phrase 'most likely' in setting out how substance should be determined. Such definitions and criteria, in the words of Sterling, connect a word (e.g. 'probable') with the occurrence of an event and then disclose the outcome or impact of that event.

However 'the available literature indicates that there is large variability in the mapping of phrases to numbers' (Budescu and Wallsten, 1985, p. 391). Chesley and Wier (1985) found that this variability persisted between the accounting and legal professions. (Lawyers are specifically mentioned as advisers as to the probability of an event in SSAP 18.) Intelligent application and professional judgment therefore of what constitutes the threshold for disclosure 'is an area that should be a cause for concern.' (Chesley, 1986, p. 180)

Similarly, this use of probability gives rise to the issue of the basis on which the probability is measured. The Task Force on Future Events (Johnson, 1994, pp. 10-12) distinguished between 3 bases on which to judge probability:

- a modal probability approach which focuses on the event which has the highest probability of occurrence. Under this approach, high-risk assets and remote liabilities are ignored.
- a cumulative probability approach which also focuses on the probability of occurrence only, but on the cumulative probability of occurrence.
- a weighted probability approach which also takes into account the magnitude of each possible outcome i.e. focuses on occurrence and outcome.

The approach currently suggested by the ASB is:

a) 'Evidence is required both that the change in assets and liabilities . . . has occurred . . . and it can be measured as a monetary amount with sufficient reliability' (ASB, 1995b, p. 67) and (through SSAP 18),

b) 'A material contingent loss should be accrued in financial statements where it is probable that a future event will confirm a loss which can be estimated with reasonable accuracy.' (ASC, 1980, para. 15)

Recognition, therefore, is not based on these criteria considered together (i.e. as a composite or 'weighted probability') but there must be sufficient evidence of occurrence alone ('modal probability') and of the monetary value of the amount to be measured. This issue raises 'challenges about how to interpret not only the past event . . . but also the probability of future events and sacrifices as called for in the recognition criteria' (Johnson, 1994, p. 13).

Two more recent accounting standards also deal with uncertainty, though indirectly and in markedly different ways. FRS 4 *Capital Instruments* states, for example, that 'conversion of debt should not be anticipated' even if conversion is likely (ASB, 1993b, para 25). On the other hand, FRS 5 *Reporting the Substance of Transactions* requires that 'in determining the substance of a transaction, all its aspects and implications should be identified and greater weight given to those *more likely* [my emphasis] to have a commercial effect in practice [and also] it is necessary to

identify whether the transaction has given rise to new assets or liabilities for the reporting entity and whether it has changed the entity's existing assets and liabilities.' (ASB, 1994a, paras. 14 and 16)

If an objective of financial statements (and the cash flow statement in particular) is to assist users in their assessment of the financial position, performance and future cash flows of the reporting entity, (ASB, 1995b) the crucial consideration in judging the impact of uncertainties is their effect on financial position and performance and future cash flows, rather than their accounting (or legal) effect *per se*. The thrust of FRS 5 (ASB, 1994a) has been to reflect the substance of risks and rewards in financial statements. Tests of evidence of existence of assets under the Standard include consideration of exposure to risks.[3] The impact of risk in all its aspects and implications will, therefore, be increasingly reflected in the financial statements of reporting entities.

In that way, the substance of business demands that the pervasiveness of uncertainty must also be recognised. One implication of the pervasiveness of uncertainty is that the analysis of uncertainty 'requires an attempt to assess the combined effect of many events and/or variables' (AAA, 1974, p. 205). Ho and Pike (1991, p. 230) argue, in a capital budgeting setting, that 'even if individual risks are known, their combined effect should also be considered':

> The uncertainty in business activity can be perceived as having many, frequently interdependent, dimensions. The means of analyzing uncertainty inherent in business activity requires an attempt to assess the combined effect of many events and/or variables. (AAA, 1973, p. 205)

In the earlier draft of its *Statement of Principles*, the ASB (1992b, para. 21) recognised that

> The environment in which entities operate is inherently uncertain and for many past events there is either a lack of certainty that there has been a change in the entity's assets or liabilities, or a lack of certainty as to the monetary amount of the change. It is this lack of certainty that gives rise to recognition problems.

[3] See footnote 1.

Skinner (1987, p. 132) calls this uncertainty 'event uncertainty'. Events happen within the context of the business in which the reporting entity operates. 'Facts arise only in context' (Vatter, 1965, p. 81). This is recognised by Boritz (1990, p. 60):

> Some uncertainties are systematic, in the sense that certain types of business activities are often understood by those in the know to be subject to major classes of uncertainty. For example, wholesale and retail businesses may be subject to changes in product appeal, seasonal factors, and economic conditions in geographic locations of their major markets; ... manufacturing companies may be subject to technological changes threatening product obsolescence, changes in customer demand, and changes in sources of supply; financial enterprises may be subject to fluctuations in interest rates, credit losses, securities prices, and foreign currency exchange rates.

Rappaport (1973, p. 177) argues that 'the cost-matching decision . . . reflects the accountant's broad perception of the relative risks associated with cost outlays.' Such a perception 'should embrace non-financial uncertainties . . . uncertainties surrounding corporate goals, employee morale, environmental responsibility and company/industry image' (Ho and Pike, 1992, p. 230) as well as the fundamental consideration of going concern.

The problems of recognition cannot be divorced from the nature of the events and transactions which a reporting entity undertakes or from the uncertainty within which the reporting entity operates. Companies exporting to Iraq, for example, may have less evidence for the recognition of trade receivables than companies selling locally; companies experiencing rapid technological change may experience more problems in measuring changes in the net realisable value of stocks than companies not experiencing such rapid change.

Recognition is triggered by the occurrence of an event which can be measured with sufficient reliability or objectivity (e.g. a sales event). The nature of the events of an enterprise dictates, therefore, whether those events trigger recognition. Uncertainties affecting recognition are a function of events, which are in turn a function of the uncertainties of the business within which an entity operates. We can here, therefore, draw together the distinction made earlier between the

risks affecting the financial position and performance of the reporting entity and the risks faced by its stakeholders. The uncertain nature of financial reporting as created by problems of recognition and measurement is underpinned by the uncertain nature of the events of the reporting entity's business and the uncertainty it creates for its stakeholders. If financial statements have a primary responsibility to shareholders, (Stahl, 1976) as a result they have a responsibility to reveal the responses of stakeholders to the risks created by the reporting entity. Those responses are the events that create assets and liabilities. The risks of stakeholders are also the risks of the reporting entity itself. They are the risks of business.

2.3.2 The risks of business

> Risk is an eliminable part of human existence . . . From the moment we gain a foothold on life, we have something to lose . . . Risks are [therefore] not only pervasive but protean. In one sense of this term there are as many 'kinds of risks' as there are kinds of negativities in human affairs. (Rescher, 1983, p. 9)

Although an attempt to classify risk may be futile, a brief attempt will be made here to enumerate some of the risks facing reporting entities in general. The ASB's *Operating and Financial Review* (OFR) offers some examples of items that may be relevant in the consideration of the 'principal risks and uncertainties in the main lines of business . . . depending on the nature of the business' and suggests that they should be discussed where applicable in the OFR. Such items include 'scarcity of raw materials; skill shortages and expertise of uncertain supply; patents, licences or franchises; dependence on major suppliers or customers; product liability; health and safety; environmental protection costs and potential environmental liabilities; self-insurance; exchange rate fluctuations and rates of inflation differing between costs and revenues, or between different markets.' (ASB, 1993a, para. 12) The OFR refers to such factors under the heading 'dynamics of the business'.

Weetman, Collins and Davie (1994, p. 70) found that the analysts they interviewed 'confirmed that any item on the list could be relevant in a specific situation but it was unlikely that all items would be relevant all the time.' One broker's analyst commented that the OFR's examples (and they are

only examples) could also include wage negotiations, competitive position and pricing policy. Boyadjian and Warren (1987) share this concern with the risks of business adding that 'the very core of corporate viability is strategic business risk . . . By strategic business risk we mean the viability of a firm within its industry and indeed the viability of that industry within the economy.' (pp. 276 and 282) This approach is illustrated by Foster (1986, p. 265) analysing an entity's prospects with respect to the prospects of the economy at large and the prospects of its industry within that economy.

Weetman *et al.* (1994, p. 35) also found that fund managers needed an 'expression from management of what factors will drive the business'. It appears this need is partly to gain an insight into management's assessment of uncertainties and risk, partly to assess management's awareness and competence in assessing risks. This need, perhaps, arises from the knowledge that

> the ultimate source of the failing firm is . . . exhibited by an internalising process that largely ignores the external realities which the firm was born to cope with. We have suggested a cluster of telltale signs in this area which should alert both lender and investor that a wary attitude is indicated. (Boyadjian and Warren, 1987, p. 291)

This 'cluster' is termed the fatigue risk model and includes business risk, financial risk (i.e. financial leverage), asset value risk, cost base risk (i.e. operating leverage) and centrally 'metal fatigue risk in management'. This model may be developed further in the sense that when business declines, entities with high financial and/or operating leverage are vulnerable. For lenders the only ultimate recourse is in asset value (which gives rise to asset risk). An awareness by management of business risk, and an ability to react to such risk, is therefore a crucial consideration in the interdependent interaction of risk.

'Metal fatigue risk in management' is characterised by Boyadjian and Warren as frequent executive shuffles and reorganisation, use of consultants, dominance of organisational issues over business priorities and frequent redefinition of objectives. The view that 'the prime cause of [company] failure is bad management' is supported by Argenti (1976, p. 125). He also argues that bad management results in a deficient accounting system and, 'vastly more important', an inability to

respond to change. He classifies such changes as competitive, political, social, economic and technological saying that 'it is often said that changes in technology are the most influential today. While this must be true in some industries I personally believe it to be a very weak generalization' (pp. 128-129). Some of the components of these changes are outlined in Figure 2.5. Stakeholders, those that can affect the business, are the source of many of those changes . . . from those changes come some of the risks of the reporting entity.

Figure 2.5: Argenti's classification of change.

Competitive Change	**Political Change**	**Social Change**	**Economic Change**
• Emergence of foreign low-cost producers • Merger of competitor firms • New ranges of competing products • New company in the industry	• Affect on production resources • New quotas, duties, taxes, levies and legislation • Changes in political attitudes towards business in general and some industries in particular	• Attitude to work • Lifestyle, demographics etc. • Attitudes to pollution and consumer protection	• Currency movement • Economic cycle • Inflation • Interest rates • Patterns of disposable income

The inability of financial accounting to deal with such change may be illustrated in the example of one element of economic change: currency movements. Pope and Marshall (1991, pp. 57-58), in a

review of the disclosure of the management of exchange rate and interest rate risk, note that

> Exchange rates and interest rates are the main sources of financial price risk faced by most companies, although price risk in other global markets such as oil and other commodities can also be very important. Changes in interest rates and exchange rates can have major impacts upon reported earnings and cash flows unless management has taken steps to hedge the risk exposure.

In the case of exchange rate risk, they go on (p. 59) to distinguish between

a) transaction exposure: 'temporary transaction exposure will occur whenever a sale, purchase or other transaction, e.g. a known foreign exchange payment, is denominated in a foreign currency and due to be completed at some future point in time.'
b) translation exposure: 'translation exposure arises on the conversion into sterling equivalents (for UK companies) of amounts fixed in foreign currencies for accounting purposes', and
c) economic exposure: 'this exposure is the most difficult to determine as it results from the structure of the business, its competitive position and how costs, output, prices and therefore profits are influenced by exchange rate movements.'

Wihlborg (1980, p. 24) defines the accounting exposure to exchange rate changes as foreign currency assets minus foreign currency liabilities translated at the current (year end) exchange rate(s). The larger the exposure the larger the potential exchange rate gains or losses in the profit and loss account. The exchange rate at which the asset or liability will mature is uncertain. The year-end exchange rate is advocated by SSAP 20 as the appropriate exchange rate to use in the translation of year-end positions as it is, generally, 'the best estimate' (ASC, 1983, para. 9) of the amount at which the asset or liability will mature.

Belk and Glaum (1990, p. 4) write that 'accounting exposure does not give a true picture of the effects of exchange rate changes on the economic value of the firm, and the gains and losses measured are purely of a paper nature.' Pope and Marshall (1990, pp 59-60), while agreeing that 'translations do not represent real movements of cash between different currencies', argue that the financial statements which result from such foreign currency translation 'can affect a company's

borrowing capacity and therefore have an indirect cash impact.' The importance attached to translation exposure is underlined by Collier, Davis, Coates and Longden (1990) who found that currency managers are more risk averse to such exposure than to transaction exposure. These arguments support the case for wider recognition in financial statements of the effect of exchange rate risk than simply the translation of balances.

Peters (1989, p. 27) agrees that accountancy is unable to recognise or measure the changes experienced by business, observing that 'to-day's management wisdom is predicated on stability. None of its tools - basic accounting practices, patterns of organisation, formulation of strategy or workforce care - can cope with the new rates of change.' Boyadjian and Warren's central thesis is that (p. 275):

> the financial statements of companies are *not* valuation statements and, perhaps more important, . . . the conventions of accountancy are simply too primitive to capture or render with much validity or accuracy the intangible realities and subtle vagaries that drive the dynamics of the modern corporation.

The ASB's Discussion Paper on the OFR conceded that

> Although the financial statements are complete in themselves, their complexity and that of the underlying business is often such that their usefulness is limited unless accompanied by interpretation and discussion by management of the enterprise's business, the risks to which that business is exposed and the structure of its financing. (ASB, 1992d, para. 2)

Although the need for accounting is 'to help [users] make decisions' (AAA, 1973, p. 212), Ronen (1977) concludes that 'the entire burden of assessing uncertain prospects falls on the user' because 'presiding over [accountancy] is the myth of certainty.' What can be done within the limits of accountancy to dispel, if not disclose the nature of, the 'myth of certainty'?

The next section will attempt to synthesise a range of suggestions which have been made in this regard.

2.4 REFLECTING UNCERTAINTY IN FINANCIAL REPORTING

As well as admitting or ignoring doubt, as suggested by Mock and Vertinsky (1985), doubt may also be quantified based on a consistent and agreed framework. Suggestions concerning how such doubts may be admitted and/or quantified are based on varying degrees of fineness. They include

i) the disclosure of the uncertain nature of financial statements, including a disclosure of significant estimates which are subject to uncertainty,

ii) the discussion of the major risks and uncertainties arising from the nature of the business,

iii) the preparation of probabilistic financial statements

iv) the use of the concepts of estimation theory,

v) the disclosure of probabilities or ranges of uncertainty concerning the occurrence and outcome of events,

vi) the disclosure of a 'layered' balance sheet distinguishing between items measured with a high degree of certainty and items measured or estimated on the basis of judgment, and

vii)the separation of recognition and realisation.

The central concerns of recognition and measurement are dealt with differently and to differing degrees by these suggestions. The first five categories appear to recognise that the consideration of recognition and measurement are not mutually exclusive and address, generally (in the case of the first two) or specifically (in the case of the next three), how the uncertainty of recognition and measurement could be addressed and disclosed. The sixth clarifies the problems of measurement in financial statements while the last broadens the consideration of recognition.

These suggestions will now be considered in turn. That consideration will concentrate in particular on those suggestions which may be viewed as evolutionary rather than revolutionary in keeping with the undertaking by the ASB 'to take account of the desire of the financial community for evolutionary rather than revolutionary change in the reporting process.' (ASB, 1991c, para. 7) Furthermore, the consideration is constrained by an awareness that 'accounting is needed to help [users] make decisions, not to make decisions for [users].' (AAA, 1973, p. 212)

i) The disclosure of the uncertain nature of financial statements

The first suggestion sets out to do no more than admit doubt and reveal in some way the extent of doubt. This form of disclosure is, to an extent, embodied in the Directors' Responsibility Statement and the general understanding of what constitutes a 'true and fair view'. It is not the objective of the former to disclose the nature of financial statements *per se* but to clarify the responsibilities of the directors with regard to published financial statements. By doing so, however, it does set out that the financial statements are prepared on the basis of 'suitable accounting policies, consistently applied and supported by reasonable and prudent judgements and estimates' (Committee on the Financial Aspects of Corporate Governance, 1992, Note 12).

Skinner (1987, p. 134) remarks that 'uncertainty is pervasive, and the user of financial statements ought to be presumed to have sufficient acquaintance with the world to know that.' Sophisticated users of financial statements are aware that 'a true and fair view' does not imply certainty. Indeed, the exact meaning of the phrase itself is uncertain. (Morse and Marshall, 1983). However

> to the man in the street ... the words 'true and fair' are likely to signify that the accounts give a true statement of facts. He will be likely to associate 'facts' with 'actual profit' and 'actual values'. (Edey, 1971, p. 440)

As well as arguing that the preparers of financial have a responsibility to non-diversified as well as diversified shareholders (as Kripke (1979) does) one may wonder whether financial reporting has a duty to the 'person in the street' as well as to the reasonably well-informed user. This broader question is outside the scope of this paper. However, how well-informed users are or what percentage of users are well-informed is unclear. The seminal surveys by Lee and Tweedie (1977 and 1981) found a poor level of understanding of the general nature of reported financial statements in the case of half of both institutional investors and private shareholders.

In the light of the search for 'actual profit and actual values', Gonedes and Dopuch (1979, p. 48) assert that 'accounting numbers may be viewed as random variables' and that 'no income model can be derived for a world of uncertainty'. Several alternatives have been advanced to clarify the

random nature of financial statements in a world of uncertainty. Among these is the proposal of the AICPA *Task Force on Risks and Uncertainties* to disclose an explanation that the preparation of financial statements requires the use of estimates by management (AICPA, 1987). An example of this disclosure is given in Figure 2.6. Boritz (1990, p. 55) recommends the inclusion of a 'management report' with all general purpose financial statements. This report would contain the disclosures currently included in the Directors' Responsibility Statement as well as an indication that 'historical financial information requires the use of approximations and estimates based on professional judgments.'

Figure 2.6: Illustration of the disclosure of the Basis of Financial Statement Preparation (AICPA Task Force on Risks and Uncertainties, 1987, p. 13)

> The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the reporting date and revenues and expenses during the reporting period. Actual results could differ from those estimates .

As well as suggesting the disclosure that financial statements are a product of estimates by management, both Boritz and the AICPA Task Force suggest that financial statements should provide sufficient disclosure and discussion of significant estimates to allow users to assess those estimates. Such disclosures would include, for example, the assumptions on which the estimate is based, the estimation methods used and would distinguish between fixed and variable components of the estimate (Boritz, 1990, p. 72). An illustration of such a disclosure is given in Figure 2.7.

Figure 2.7: Illustration of the disclosure of significant estimates in the financial statements (AICPA Task Force, 1987, p. 15 and Boritz, 1990, p. 75).

> At December 31, 1987, because new competition has caused unanticipated reductions in demand for one of its products, XYZ has inventories in excess of its current requirements that are reported at $6 million in the accompanying balance sheet. Management has developed a programme to reduce the quantities to desired levels and believes no loss is probable on their disposition. XYZ's ability to recover the cost of the inventories depends, however, on the success of its program, which may be affected by competitive and other factors beyond its control.

This particular disclosure is not unprecedented. It is in the nature of disclosures concerning the uncertainty of, say, bank support and its implications for going concern, or even in the nature of the disclosure of contingencies. Indeed, the illustration of it does not reveal the nature of the estimate or the method of estimation. Furthermore, if uncertainty is pervasive and financial statements are surrounded by uncertainty and estimation, which estimates should be disclosed and which should not?

> A significant estimate requiring disclosure is one used to determine the carrying amount of an asset or a liability that, based on facts and circumstances existing at the balance sheet date, is *particularly susceptible* to changes that could result in a *material* adjustment to results of operations in the *near term* . . . The criteria for significance do not depend on the amount that has been reported in the financial statements, but rather are based on the significance of the estimate and the degree of its variability. (AICPA, 1987, p. 13)

Unlike the criteria for the disclosure of contingencies, therefore, which is 'determined by its expected outcome' (ASC, 1980, para. 3), the disclosure of significant estimates would be determined by their perceived significance and variability. The impact of the variability of the estimate should, at the reporting date, be near term as disclosures whose impact is only long-term are less relevant, reliable and significant.

ii) The discussion of the major risks and uncertainties arising from the nature of the business

The first suggested approach to uncertainty in financial reporting concentrates on the nature of financial statements themselves. The second focusses on the nature of the business in which the reporting entity operates. The AICPA Task Force suggested the disclosure of the nature of the operations of the reporting entity as well as 'current vulnerability due to concentrations of assets, customers or suppliers.' (AICPA, 1987, p. 5) Such disclosures, it could be argued, are implicitly required by SSAP 25 and by the requirements of both the Stock Exchange and company law. The purpose of providing segmental information is to

> to provide information to assist the users of financial statements:
>
> (a) to appreciate more thoroughly the results and financial position of the entity by permitting a better understanding of the entity's past performance and thus a better assessment of its future prospects; and
>
> (b) to be aware of the impact that changes in significant components of a business may have on the business as a whole. (ASC, 1990, para. 1)

While the Standard does not have the assessment of risk as an explicit objective, the disclosure of segmental information has been identified by several commentators as an important indicator of risk (e.g. Pope and Marshall, 1991, p. 60; Boritz, 1990, p. 60) and the usefulness of such information has also been extensively researched (e.g. Baldwin, 1984; Balakrishnan, Harris and Sen, 1990). It is interesting to note that the determination of reportable business segments may be based on different classes of business or different geographical areas that 'are subject to different degrees of risk' (ASC, 1990, para. 8) although this is one of four aspects which may be considered when defining a segment.

Segmental information is, however, by its nature, an indicator of the risk attached to being involved during the reporting period in a certain geographical area or in a certain class of business. While these segments are the source of some risks, they are not the source of all risks. They are indicators furthermore of historical industry-specific risk, area-specific risk and some related risks such as exchange risk. and give an indication of company-specific risk only to the extent of the involvement of the company in the industry or geographical area. Hussain and Skerratt (1992)

model the value of segmental information based on the ability to assess from it the performance (in the sense of profits and activity) of the reporting entity relative to the rest of the industry in which it operates. Such an indicator of relative performance is also suggested by Thornton (1983, p. 14):

> One possibility [of disclosing unhedged contingencies] would be for every firm to disclose the estimated correlation coefficient between its contingencies and some market-wide index such as gross national product or returns on a stock market index.

The intention of the AICPA Task Force disclosure, however, is to inform the user about risk 'other than one that is generally known to be associated with the industry or trade in which the entity operates' (AICPA, 1987, p. 19) Such a disclosure may take the form of those presented in Figure 2.8.

Figure 2.8: Illustration of a disclosure of information related to concentrations (AICPA, 1987, p. 20).

At December 31, 1987, approximately 12 percent of the bank's loan portfolio comprises loans to independent oil and gas ventures. Including oil and gas venture loans, approximately 85% of the bank's loan portfolio is with customers located in the state of Texas.
Felt Pharmaceutical Company is a national pharmaceutical manufacturer with sales throughout the United States. The patent on one of its major products expires next year. This product accounts for 35 percent of the company's revenues and a higher percentage of its gross profit.

Again, it could be argued that such disclosure is already provided and would be required in a broad sense in order to present a 'true and fair view' of the entity's financial position or to reflect the substance of transactions. AIB, for example, provides the disclosure set out in Figure 2.9 in Note 13 of its 1991 Annual Report.

Figure 2.9: AIB Disclosure of risk an uncertainty arising from the business (Source: AIB Annual Report 1991, p. 38).

	1991	1990
Latin American debt	**US $m**	US $m
The Group's outstandings are to the following countries:		
Mexico	**92.4**	96.8
Venezuela	**23.9**	33.3
Chile	**15.9**	16.3
Brazil	**5.4**	7.6
Other Latin American countries*	**17.1**	19.9
	155.3	173.9
	IR£99.8	IR£110.2

* *'Other Latin American countries' are Argentina, Colombia, Ecuador and Peru.*

The Group's provisions against Latin American debt represents 65% of the Group's outstandings to these countries. The secondary market value of this portfolio at 31st. March 1991 exceeds its written down value by US $50m.

'The goal of generally accepted accounting principles is to provide financial statement data which faithfully portray the realities of enterprise operations and financial conditions' write Mautz and Sharaf (1961, p. 203) who continue that such presentation can be achieved by realistic recognition of enterprise transactions, and their effects, as they occur. This principle is embodied in the APB's SAS 600 *Auditors' Reports on Financial Statements*. This Statement considers the implications of uncertainty for the auditors' consideration of the true and fair view. The Statement requires that auditors consider whether the view given by the financial statements could be affected by inherent uncertainties which, in their opinion, are fundamental (APB, 1993, para. 54). In the context of the audit report, inherent uncertainties are those which affect a wide range of components of the financial statements (and not just one). Inherent uncertainties should be dealt with by appropriate accounting policies and adequately disclosed. They become fundamental when they threaten the going concern assumption or when their effect on the financial statements is 'unusually great' (para. 64).

A central question to be addressed in this context is 'what level and type of uncertainty triggers disclosure and / or recognition?' The answer to this question decides the extent of the disclosure

of uncertainty in financial statements. The AICPA (1987) and Boritz (1990) propose the disclosure of 'significant estimates'. The ASB in its draft *Statement of Principles* (ASB, 1995b) requires sufficient evidence for recognition and in the absence of such evidence disclosure of the nature of the estimate. The APB (1993) requires the consideration of inherent or fundamental uncertainty. Each threshold is defined differently and applied by the exercise of professional judgment.

Also central to such considerations is the timing of the event (past or future), its impact on the financial statements, uncertainty regarding its occurrence and its outcome but also whether uncertainty is created by a particular event or by circumstances in general. Skinner (1987, pp. 133-134) makes that distinction between general risks and specific risks and continues: 'it is uncontentious that general risks attributable to the business carried on are not required to be described in financial statements . . . That being said, it is a different situation when a general business risk threatens to become an immediate claim or risk.'

Thornton (1983, p. 15) draws a distinction between uncertainties arising from endogenous and exogenous circumstances. Uncertainties which he describes as endogenous are those 'risks that a well-informed entrepreneur would expect to face in his chosen line or lines of business' while risks or uncertainties that would not be expected in the particular line of business are described as exogenous. Thornton takes the view that the reporting of specific endogenous uncertainties is 'redundant if normal business risks are already implicit in the history of the firm's operating results and in the history of its security prices.' This conclusion is supported by portfolio theory which would distinguish between risks which are general to the market ('market risk') and risks which are specific to the entity ('unique risk'). Well-diversified shareholders, through their portfolio, minimise the risk of holding shares in a specific entity. They would be concerned therefore only with the market risk arising from exogenous uncertainties. The disclosure of exogenous rather than endogenous risks would, he argues, be useful in that context.

The assumption is, of course, that shareholders are the only users that need information concerning uncertainty or that shareholders are well-diversified. Section 2.2 discussed that contention and

concluded that users are a widely heterogeneous group with different needs, knowledge and different levels of influence with regard to the reporting entity. Even among shareholders themselves

> there is extensive diversity. Shareholders include diversified versus undiversified, those using professional financial advisers and those who do not, those knowledgeable about financial statements versus those informed, and actual versus potential owners of securities. (Wolk *et al.*, 1984, p. 180)

The world or market of users (whatever about of securities) is not perfect. The uncertainties that an entrepreneur would expect to face are not necessarily known to users at large.

This may lead to differences in reaction among users to endogenous (known) and exogenous (unknown) uncertainties. Disclosures regarding known risks, for example, may lead to greater confidence and agreement concerning the uncertainty facing the entity. On the other hand, disclosures of hitherto unknown risks may lead to less confidence and less agreement and to a search for information and reassurance from other sources besides the financial statements. The construction of the research hypotheses in chapter 6 elaborates on some of these issues.

The ASB attempts, through the OFR, to establish 'a framework for the directors to discuss and analyse the business's performance and the factors underlying its results and financial position, in order to assist users to assess for themselves the future potential of the business' (ASB, 1993a, para. 1). As part of this framework, the OFR should include discussion of:

- trends and factors underlying the business that have affected the results but are not expected to continue in the future; and
- known events, trends and uncertainties that are expected to have an impact on the business in the future.(ASB, 1993a, para. 3)

The OFR thus distinguishes between what might be termed discontinued and continuing trends and uncertainties. This distinction (rather than the distinction between the general and the specific, the exogenous and the endogenous) is crucial to the user in assessing the future potential of the business and which reflects the concern within FRS 3 'to assist [users] forming a basis for their assessment of future results and cash flows.' (ASB, 1992c, para. 1)

The OFR, like the Management and Discussion Analysis in the US, is outside the general-purpose financial statements, something which was discouraged by Boritz (1990). The OFR therefore is general and discursive. If uncertainty creates difficulty for measurement and quantification, perhaps that uncertainty can only be addressed by broad, qualitative disclosures. This approach, however, has implications for the mutual understanding of the disclosure. Users' understanding of and preference for qualitative (as opposed to quantitative information) and descriptive (as opposed to technical) information differs between groups (Wetherick, 1967; Chesley, 1986; Du Pree, 1985; Lewis, Parker, Pound and Sutcliffe, 1986). These differences have implications for the relevance (in the sense of reaction to) and understandability of disclosure and will form part of the research objectives in chapters 6, 9 and 10.

iii) Probabilistic financial statements

The Committee on Concepts and Standards - External Financial Reporting of the AAA (1973, pp. 219-222) suggested the presentation of 'full-scale probabilistic statements'. Such statements 'are based on reducing a discrete probability distribution for each year to a single value, the mean, and then the present worth of the means are discounted to find a present value of the future cash flows.' The problem of recognising events at a particular time and realising the resultant gain or loss is one of allocation (e.g. of gains or losses to a particular time-period).

Thomas (1974, p. 50) argues that 'most amortisation and contribution allocations are either totally or indeterminately ambiguous.' In response to the critical problem of the arbitrariness of allocation, which arises from uncertainty and indeterminacy, Milburn (1988) explores the use of the calculation of assets and liabilities on a present value basis. Relaxing 'the assumption of perfect certainty', Milburn (p. 39) argues that the discount rate used in present value calculations comprises the risk-free rate plus allowances for expectations and risk concerning the recoverability of the investment, the inflation rate and a liquidity/preference premium. The ASB in a Working Paper on *Discounting in Financial Reporting* comments (ASB, 1997a, p, 5) that 'in order to determine what discount rate should be used in any particular situation, it is necessary to consider

the implications of risk'. The discount rate therefore allows the preparers and users of financial statements to adjust for the effect of perceived uncertainty. The objective of the ASB's Working Paper is not to reflect uncertainty *per se* but to reflect the time value of money in the valuation of an asset or liability (ASB, 1997a, p. 2). As such, probabilistic financial statements are not central to the current evolution of accounting thought as reflected for example in *Measurement in Financial Statements* of the ASB's draft *Statement of Principles.* This as yet revolutionary suggestion is explored in more detail by Milburn (1988). As this research is policy-driven and evolutionary in nature and is not specifically concerned with discounting as a valuation tool, it is not proposed to delve further into the potential of probabilistic financial statements when developing the research hypotheses in chapter 6.

iv) Estimation Theory

The notion of present value and/or probabilistic financial statements is not far removed from estimation theory as described by Thomas (1974) and proposed by, for example, Brief and Owen (1968, 1969). Thomas (p. 98) provides the following example which best illustrates this theory:

> Let us suppose that current inflows total $10,000,000, and that the accountant exogenously estimates the firms long-run rate of return on current inflows to be 7 per cent. Net income would, then. be reported as being $10,000,000 * 7%=$700,000, and total expenses would be reported as being $10,000,000 - $700,000 = $9,300,000 . . .
>
> Let us suppose that the accountant exogenously estimates the firm's long-run rate of return on invested capital to be 10 per cent. Total assets would be reported at an amount that is consistent with this rate of return: $700,000/10%=$7,000,000 . . .
>
> Let us suppose that monetary assets totalled $2,900,000; then, nonmonetary assets would be reported at the amount, $7,000,000 - $2,900,000 = $4,100,000. This amount corresponds to what ordinarily would be reported as the total net book value of all inventories, prepayments, plant and equipment.

Estimation theory does not eliminate uncertainty. (No approach to accounting can eliminate uncertainty according to Thomas) It does, however, aim to go some way toward constructing financial reports 'in a manner consistent with the reader's specific estimation needs' and eliminate 'the distortions caused by the use of arbitrary allocations' (Thomas, 1974, p. 98). The intention of the theory is not primarily to address uncertainty but to address the problem of allocation. In doing so it addresses uncertainty in a narrow, albeit radical, way. The heterogeneous nature of users' needs (including estimation needs) in the context of pervasive uncertainty demands a broader, though less radical approach, which would represent an evolution rather than a revolution in accounting practice.

v) Disclosure of ranges of uncertainty

A Statement of Basic Accounting Theory (1966, p. 65), in a section on the scope of future accounting, commented that

> Another aspect of multiple valuations involves the use of non-deterministic or quantum ranges with or without probabilistic measures. In view of uncertainties surrounding business activities and the measurement of their impact, the use of non-deterministic measures is likely to become a part of an expanded accounting discipline of the future.

In the general context of the consideration of risk in decision making Hull (1980, p. 21) remarks that

> 'pessimistic' and 'optimistic' estimates provide an indication of the uncertainty surrounding the best estimate for a particular variable but, for a complete description of that uncertainty, a probability distribution is required.

Such probabilities, continues Hull (pp. 45-48) could be estimated and expressed in the form of a fixed interval (and estimating the probability of the occurrence and/or outcome of an event being realised within that interval) or a variable interval (estimating an interval surrounding an occurrence/outcome with a specified probability). These methods are the most widely used, writes Hull, in management decision making under uncertainty. An example of fixed interval and variable

interval disclosures of debtors is given in Figure 2.10.

Figure 2.10: Disclosures of ranges of values - a) fixed interval and b) variable interval

a) Debtors, net of provision for bad debts, are stated in the balance sheet as £150,000. It is estimated by the directors with a probability of 93% that debtors will realise between £135,000 and £165,000.
b) Debtors, net of provision for bad debts, are stated in the balance sheet as £150,000. The probability of realising that amount is estimated by the directors as between 91% and 97%.

This example illustrates the link between events and the disclosure of uncertainty. Greater uncertainty surrounding events (e.g. sales to Iraq, economic recession) will lead to the disclosure of a wider range or a lower confidence level concerning particular items. Thomas (1974, p. 51) calls financial statements not just statements but assertions. The disclosure of probability ranges or confidence intervals reveals the basis on which the assertions in the financial statements are made.

The accommodation of uncertainty in financial statements in this manner was also mentioned by the AICPA Objectives Report (1973) and by other writers such as Bedford (1965), Devine (1966), Vatter (1966) and Thornton (1983). Thornton (p. 37) writes:

> In the context of financial reporting, the decision tree approach to uncertainty may also be a useful rule of thumb that can be used to frame the public disclosure of some important kinds of contingencies. Under this approach, the contingent impacts of events on the firm's financial statements are the outcomes at the ends of the branches. The probabilities on the branches are subjectively assigned by management . . . For many contingencies, it may not be possible for management to assign numerical probabilities with precision. Even so, it can still be useful to disclose the tree, perhaps in a highly simplified form, then to indicate whether the contingencies are likely or unlikely.

This approach has two advantages according to Thornton: first, it distinguishes clearly between occurrence and outcome (helping perhaps to solve the problem of zero-infinity events) and second,

it clearly divides the function of preparer and auditor, the preparer assigning the probabilities and the auditor assessing the reasonableness of that assignment and the impact of the events on the financial statements.

Recognising that 'the accountant's attempts to disclose precision are crude indeed', Devine (1966, p. 22) argues that

> a little-explored alternative estimates probability numbers for both the amount to be paid and the possibility of having to pay at all and derives an expected value for the unfavourable prospect.

It was indeed 'little-explored' at that time. Subsequent research (explored in detail in chapter 4) represents variations on the theme of the disclosure of probability measures. Oliver (1972), Birnberg and Slevin (1976), Keys (1978), Chen and Summers (1981) and Coats and Chesser (1982) arrived at various conclusions depending on the structure of the information provided and nature of the participants. Birnberg and Slevin, for example, concluded (p. 153) that 'the presence of a formal confidence interval statement did not yield significant differences in the subject's decision' as 'apparently the skilled user of financial statements already possesses a notion of the relative size of the confidence interval around the point estimate from past experience.' (p. 156) Chen and Summers (1981, p. 13) found, however, that 'removing the appearance of certainty from accounting affects decision making behaviour.' They also comment that 'a mere indication of the uncertain nature of the reported figure does not necessarily provide subjects with more information that the conventional single-valued accounting figure.'

Less radical echoes of these proposals resound more recently in the ASB's draft *Statement of Principles.* The ASB comments that uncertainty creates variability in outcome (if not doubts regarding occurrence). This variability can be reduced by evidence such as a transaction price, a market-based measure or by measuring the value of a group of homogenous but not identical outcomes of which the outcome in question would be a part.

The draft (ASB, 1995b, p. 78) continues, however,that:

> Where assets and liabilities are subject to uncertainty, simply reporting a single amount may create an impression of certainty of outcome that does not in fact

> exist. Hence, where the effect of uncertainty is potentially significant, clear disclosure of the degree of uncertainty surrounding the estimate is necessary. Such disclosure might include the significant assumptions used, the range of possible outcomes, the basis of measurement and the principal factors that affect what the outcome will be.

FRED 14: *Contingencies and Provisions* (ASB, 1997b, p. 27) proposes a similar disclosure of contingencies.

These suggestions are somewhat similar to those advanced by Vatter (1965) and also by Bedford (1966, pp. 61-62), who advocated that 'the range of possible error should be disclosed'. He extended the disclosure, however, to include the disclosure in the form of a standard deviation 'the tendency of variations to deviate from any one count.' This would provide some information regarding the 'reliability (confidence levels) and precision (error ranges within which the true figures are expected) of accounting numbers.' (Bloom, 1980, p. 12)

vi) The balance sheet as layers of certainty

As well as suggesting the disclosure of 'a fairly extensive description of how [a range of expectations of a value] was established' Vatter (1965, p. 87) suggests that financial statements should distinguish

> between those things which accountants do measure objectively, and those other items that cause trouble because of the estimates and judgments that are inevitable.

The process of accounting is a process of aggregation and measurement. 'Economic resources' writes Ijiri (1966, p. 154), 'can be classified into a number of classes in such a way that items in each class have identical properties and can be measured by a suitable physical measure.' As a result, 'an individual balance sheet is therefore a configuration made up of parts.' (Morgenstern, 1963, p. 82) Each of these parts, argues Morgenstern, can be measured with differing probability. Cash, for example, can be measured with a probability of one, while there may be more certainty

concerning the measurement of, say, government securities than the measurement of debtors.

Morgenstern (p. 82) calls 'the amounts with probability of one the 'kernel' or 'core' of the balance sheet. All others are farther and farther away from the core'. The modern balance sheet, by convention and legislation, distinguishes between fixed assets and current assets. Fixed assets are classified as tangible, intangible and financial. Current assets comprise stock, debtors and prepayments and bank and cash. The order in which they are presented reflect their position in the trade cycle: fixed assets are purchased to produce stock which is sold (if on credit) to debtors who (eventually) pay cash. Such a presentation reflects the nature of the assets and their distance from realisation as cash (and the further that distance the more uncertain the ultimate realisation of the asset may be). It does not, however, specifically reflect the uncertainty or risk attached to those assets as outlined at the beginning of this paper. Different types of asset (fixed, current etc.) may have different uncertainties attached to their existence and valuation. Some fixed assets may be more certain than some current assets and so on. As a result, the pervasiveness of uncertainty may result in a proliferation of balance sheet captions and disclosures. There is a need for some threshold of significance for uncertainty to be recognised and / or disclosed. This particular suggestion discloses layers of uncertainty in the balance sheet. Another, which does establish a threshold (or thresholds) for recognition and separates recognition and disclosure, proposes layers of uncertainty in the profit and loss account.

vii) The separation of recognition and realisation

The *Committee on Concepts and Standards - External Financial Reporting* of the AAA (1973) asked a question which is central to the discussion of uncertainty and measurement in financial statements: 'in a world of uncertainty at what point can income be measured with sufficient reliability to warrant entering it into the accounts and reporting it in the income statement?' (AAA, 1973, p. 213) Commenting that any realisation in financial statements requires the uncertainty concerning an event to pass below some professionally determined threshold, one of the solutions put forward by the Committee is to separate recognition and realisation, to 'broaden the realisation distinctions made within the accounts themselves' (p. 216). In that context, more uncertainty may

be tolerated regarding the evidence required to recognise an item than to account for its realisation. As a result, events may be recognised but not realised. The threshold level for realisation would then be more stringent: 'realisation serves but one purpose - to inform the reader that the probability of receiving recognised value changes is now almost certain.' (p. 218) An example of an income statement conforming to these revised criteria is offered in Figure 2.11.

Figure 2.11: Suggested income statement resulting from a separation of realisation and recognition.

Revenue recognised during the period
Less: Expenses recognised during the period
Operating income recognised during the period
Less: Income recognised but not realised
Plus: Income recognised in prior periods but realised during the period
Operating income realised during the period

The reflection of uncertainty in this manner could equally be advanced as a reflection of changing prices (which would lead to differences in the amounts if not the events recognised and realised). The factors determining realisation and recognition remain unaddressed and undisclosed. This approach merely serves to 'broaden the treatment of uncertainty in accounting records' (AAA, 1973, p. 216) not necessarily to clarify or share it. Given the layered format of the profit and loss account introduced by FRS 3, the addition of more layers is unlikely to clarify further an entity's performance.

2.5 CONCLUSION

This chapter has set out in some detail the increasing importance of uncertainty to the stakeholders of the modern reporting entity, the inherently uncertain nature of financial statements and hence the relevance of research concerning uncertainty to the accounting discipline. Financial reporting has evolved to include within its objectives decision-usefulness and, further, the view that in order to

meet the needs of users financial statments should reflect the substance rather than the form of financial transactions. Therefore, where the substance of the world is increasingly uncertain, uncertainty is increasingly important to the evolution of financial reporting.

A number of suggestions concerning how financial statements might reflect uncertainty were then outlined. Some of these were, such as the disclosure of the uncertain nature of financial statements, the discussion of the major risks and uncertainties arising from the nature of the business and the disclosure of probabilities or ranges of uncertainty, evolutionary and pragmatic. Others were more revolutionary and abstract. Chapter 5 will outline in more detail the specific contribution of these suggestions to the development of the research in accordance with its policy-driven objectives.

If, as Keynes argued (quoted in section 2.1), uncertainty is part of the human condition, further consideration of uncertainty requires perhaps an exploration of the reaction of individuals to uncertainty. The following chapter reviews the broad literature concerning decision-making within the context of uncertainty before chapter 4 outlines previous work in the area specific to the accounting discipline.

CHAPTER 3

DECISION-MAKING AND UNCERTAINTY

3.1 INTRODUCTION

Chapter 2 outlined in general terms the development and evolution of accounting thought with regard to uncertainty. In doing so, it established (in section 2.2) the relevance and (in section 2.3) the context of research regarding uncertainty in financial reporting. The proposals in chapter 2 addressed risk and uncertainty in different ways. In particular, policy proposals concerning uncertainty adopted different nuances. Accounting standards concentrate on the risk of particular events. SSAP 18 specifically excludes the uncertainties concerning aspects of the financial statements. The OFR (in the UK and Ireland) and (in the US) *Management Discussion & Analysis* (MD&A) indicate a general, discursive consideration of key risks. They do not therefore attempt to implement the suggestion of ASOBAT. The contention of Kloman (who has more of an affinity with risk science than with accounting) that 'tomorrow we may live in the 'world according to GARP' (generally accepted risk principles)' (Kloman, 1990, p. 10) is more aspiration than reality.

The decision-making literature is itself littered with uncertainty and peppered with paradox. Even an agreed definition of uncertainty and risk is illusive. A distinction is drawn between risk and uncertainty. However, 'there does not seem to any general agreement about which concept should be associated with which word.' (Edwards, 1954, p.27) Edwards characterises risk in terms of knowledge of the probability of an event occurring and uncertainty as a lack of the knowledge of such a probability. March and Shapira, drawing from Pratt (1964) and Arrow (1965), write that 'risk is most commonly conceived as reflecting variation in the distribution of possible outcomes, their likelihoods, and their subjective values' (1987 p. 1404) and later (1992, p. 172) that 'riskiness is associated with lack of certainty'. Byrne, Charnes, Cooper and Kortanek (1968, p. 18) 'conceptualise 'risk' as emerging from the fact that some of the information which is pertinent to a decision can best be known only in the form of specified probability distributions. The resulting possibility of deviations from any estimate of the events governed by such probability distributions is then the basic phenomenon which we shall suppose gives rise to risk.'

It has been said that the changes in the SEC MD&A requirements were 'intended to give an investor an opportunity to look at the company through the eyes of management' (Dieter and Sandefur, 1989, p. 70). Accounting thought appears, in these terms, to have evolved from a suggested disclosure of risk in theory (AAA, 1966, p. 65; Dau, 1978, p. 53; Keane, 1987, pp. 34 and 35) to a disclosure, in practice, of uncertainty (ASB, 1993a, 1995; APB, 1992; AsSEC, 1993) In the OFR, (ASB, 1993a) risk is an expression of uncertainty.

An important characteristic of such expressions is that 'probabilities do not exist as characteristics of the physical world; they are a person's statement about his degrees of belief' (Phillips, 1970, p. 255). This argument, which is supported by de Finetti (1964), forms a central part of our attempt to characterise the process of disclosure in the context of uncertainty: whether such disclosures can be isolated from their preparer, whether probabilities are a 'statement of degrees of belief', or whether 'probability is not subjective. It is not, that is to say, subject to human caprice. A proposition is not probable because we think it so.' (Keynes, 1921, p. 4) This draws the distinction, perhaps, between emotion and reason which 'have been recognised to be adversaries from the very beginnings of Western thought.' (Kogan and Wallach, 1964, p. 1)

Such distinctions emphasise the problem arising from the approach adopted by the standard-setting bodies which has been identified by Beaver, Kennelly and Voss (1968) as a need to:

a) 'define the decision models (or processes) of potential users of accounting data' (p. 679)

and also by Anton (1964, p. 6):

b) 'who will be the decision-maker and [what will be] the uncertainty of his context.'

Singer and Singer (1985, p. 114) suggest that 'for those engaged in preparing financial reports or financial information for decision support, a greater awareness of the habits of thought of the various users of the information, as well as the social and political context in which it will be used, could be to everyone's advantage.'

This chapter considers the habits of thought of users (in the Section 3.2) and, ultimately, (in Section 3.3) their context. In particular, the first section examines the evolution of descriptions and theories of decision-making over a number of centuries. More recent theories of decision-making have emphasised the context of decisions. Section 3.3 introduces some of these theories in a broad organisational context of accounting. Further, more specific studies of that context are discussed in the following chapter. The chapter concludes in Section 3.4 by drawing together briefly some of the ideas explored in this and the previous chapter to introduce the framework within which the research then proceeds.

3.2 DECISION MODELS, THE DECISION-MAKER AND UNCERTAINTY

The discussion in chapter 2 drew on two different propositions in accounting and finance: the decision-usefulness approach (of which predictive ability is a component) and the Efficient Markets Hypothesis (which leads to capital asset pricing theory). Two further comments in these fields concentrate on the contribution that decision theory may make in the setting of these propositions.

The AAA *Committee on Accounting Theory Construction and Verification* argued that 'the predictive ability approach has been an essentially impersonal approach to the information needs for decisions; it has ignored the behavioural interactions of the accounting data and the decision-

maker.' (AAA, 1971, p, 63) Gooding (1975, p. 1301) has written that 'in capital asset pricing theory, investors are assumed to base their asset decisions on expected risks and returns. Although this theory has been widely accepted in the academic community, the behavioural assumption underlying the theory has not been directly tested by surveying actual investors regarding their decision processes.'

The importance of risk in financial reporting was discussed in chapter 2 in the context of aggregate, market efficiency. It may seem incongruous, therefore, to disaggregate that market into the individuals that, together, comprise that market. Gonedes and Dopuch (1974, p. 106) argue that 'the attainment of equilibrium in a market is induced by the workings of the system as a whole or aggregate behaviour and not by the actions of particular individuals.' The external validity of such an approach has been questioned by, among others, Underdown and Taylor (1985, p. 118) and Wolk *et. al.* (1984, p. 205) on the basis that it is hard to generate a general theory of the market from samples of individuals from within that market. Individual decision-making is dependent, as we shall see, on its context. (Schoemaker, (1990); Lipshitz (1993)) The reservation is not so much that the whole may exceed the sum of the parts, but that the parts may be so diverse and intangible that their aggregation may be invalid.

Beaver, however, while recognising the weaknesses of behavioural research (Beaver *et al*, 1968) supports the notion that 'evidence is needed on how individual investors, as opposed to the aggregate prices, react to information . . . The application of behavioural science . . . offers promise here . . . Further research is needed to examine to what extent financial statement data are helpful to individual investors assessing the risk of a security' (Beaver, 1973, pp. 54-55.) May and Sundem (1976, p. 760) describe the process by which accounting information impacts on the capital markets as summarised in Figure 3.1:

Figure 3.1: Accounting information and the capital markets (after May and Sundem, 1976)

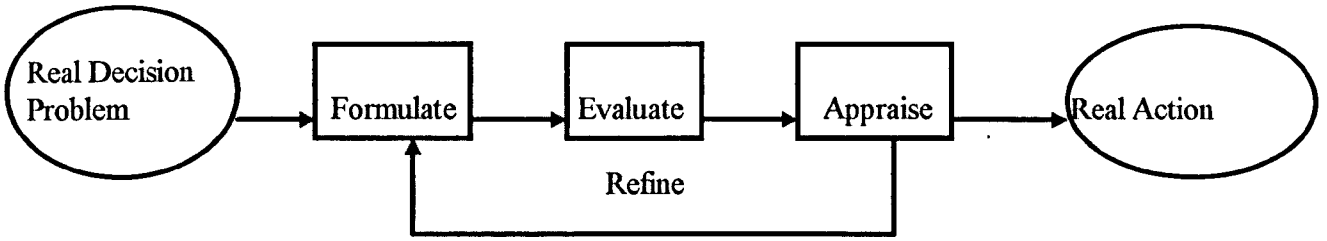
Process 1	Unanticipated Accounting Signals (New Information)
Process 2	Individual Expectations Revised
Process 3	Individual Actions
Process 4	Aggregate Supply/Demand for Securities
Process 5	Share Price Changes

They characterise processes 2 to 4 as a 'black box' and complain that security price-based research concentrates on processes 1 and 5, ' 'leapfrogging' from accounting outputs to aggregate market consequences', to the exclusion of individual decision-making and the aggregate actions that result from such decision-making. Behavioural research is further supported by ASOBAT referring to the question of 'how different accounting measurements will influence the thinking of decision-makers' (p. 70). This concern is supported by Tweedie and Whittington's observation (1990, p. 98) that 'the informational approach may help' to provide an insight into the recognition and measurement issues arising from uncertainty. No claim is made as to the conclusiveness of this approach: a survey of the rich, diverse decision-making literature 'may help': it 'offers promise'. This chapter will concentrate on May and Sundem's second and third processes by discussing individuals' risk expectations / perception and, also, the action that follows from such perception.

3.2.1 Risk expectations

Howard (1988, p. 681) characterises the decision analysis process as shown in Figure 3.2.

Figure 3.2: The Decision Analysis Process (Howard, 1988, p. 680)



The analysis / logical evaluation component, he writes, has been represented in mathematical form by Bayes' theorem. As pointed out by Einhorn (1976, p. 196), however, the field of behavioural science is an 'intersection of psychology, economics, statistics, and management sciences.' It is therefore characterised by differing perspectives as well as differing, though not mutually exclusive, aims, assumptions and conclusions. Take, for example, perspectives of probability:

> A statistician's aim, as statisticians work at present, is to obtain plausible conclusions from data subject to random fluctuations. He necessarily has to study probability, since conclusions from such data can never be certain. Now when (psychologists) speak of probability (they) usually mean an attitude of mind . . . To a psychologist, it is of interest to study how such attitudes come about, and how strong they are, and why different people think differently. But to a statistician, such variability from person to person is a nuisance.' (Smith, 1974, p.175)

Kogan and Wallach conclude (1964, p. 206) that 'motivational influences may intrude upon thinking in various ways and to varying degrees. It is at this point that our results bear upon the long-standing problem of the relative dominance of external and internal determinants in thinking processes.' Freud is one of the advocates of the doctrine which argues that 'thinking activities emerge from a motivational source. Man comes to take account of the environment's features only grudgingly as an indirect route toward achieving motivational gratifications.' (Kogan and Wallach, 1964, p. 206) Gestalt theory on the other hand argues that humans think within their environment

and that successful adaptation to the environment is a feature of mature cognitive processes (see for example, Piaget (1951) and Wertheimer (1961)).

Although this distinction rests in the field of psychology, its legacy remains in the manner in which the vastly various views of decision-making under uncertainty are discussed: views of the environment, whether it is single-stage, dynamic or chaotic, deterministic or probabilistic, ambiguous or uncertain; and also, views of the decision-maker and decision-making within that environment or what Newell and Simon (1972) term the 'problem-space'.

3.2.2 The 'problem-space'

'Since the cognitive revolution', writes Lopes (1994, p. 198), 'psychologists have seen people as systems for encoding and processing information.' This view is re-enforced by Newell and Simon's *Human Problem Solving* which concludes 'Humans, when engaged in problem-solving in the kinds of tasks we have considered, are representable as information processing systems [IPS].' (Newell and Simon, 1972, p.788). Newell and Simon continue (pp. 788-789):

> The shape of the theory we propose can be captured by four propositions:
>
> 1. A few, and only a few, gross characteristics of the human IPS are invariant over task and problem-solver.
> 2. These characteristics are sufficient to determine that a task environment is represented (in the IPS) as a problem space, and that problem solving takes place in the problem space.
> 3. The structure of the task environment determines the possible structures of the problem space.
> 4. The structure of the problem space determines the possible programs that can be used for problem solving.

The role of financial accounting in the problem space is, essentially, to provide financial information useful to decision-makers (ASC, 1975; AICPA, 1973; ASB, 1995b). Newell and Simon liken the search for information within the problem space to hill-climbing:

> In climbing a (not-too-precipitous) hill a good heuristic rule is always to go upward. If a particular spot is higher, reaching it probably represents progress toward the top. The time it takes to reach the top will depend on the height of the hill and its steepness, but not on its circumference or area - not on the size of the total problem space. (Simon and Newell, 1970, p. 152)

The issue of whether the objective is actually to make progress towards the top or some other goal is a motivational one, and will be addressed in Section 3.3. Of relevance in the consideration of the task environment, however, is the nature of that environment: whether static or dynamic (Edwards, 1961; Simon and Newell, 1970). The distinction between static and dynamic decision environments could also be termed a distinction between decision-making in the short-run and in the long-run (Lopes, 1981). Short-run models of decision-making imagine a world of single choices, while long-run theories are concerned with a sequence of choices where the outcome of one choice may affect future choices. Rapoport and Wallsten (1979, pp. 172-173) distinguish between 'single-stage and multi-stage tasks depending on the number of decisions the decision maker (DM) is required to make . . . The DM together with his environment constitute a 'system' which may be in one of several states.'

Edwards (1954 and 1961) and Lopes (1994) provide a comprehensive review of early, single-state decision theories. The theories range from expected value and expected utility to subjective expected value and subjective expected utility. A persistent theme in such theories is the notion of mathematical expectation. Choices have consequences which can be characterised in terms of probabilities. The decision-maker is faced with a choice of two outcomes, x_1 having a probability of p_1 and x_2 having a probability of p_2. A dilemma of decision theorists has been to hypothesise as to what worth (value or utility, subjective or not?) can be attached to such a choice and, later, the decision-maker's preference for such a choice *vis-a-vis* other choices. As with accounting theory and practice, the approaches to this dilemma have evolved, though over centuries rather than decades.

Early (17th Century) assessments of what this choice was worth concluded that it was worth its expected value (EV), where EV = $p_1x_1 + ... + p_sx_j$ where p_s is the probability of event x_j. Such an assessment was challenged by Bernoulli's St.Petersburg paradox:

> Appealing to intuition, Bernoulli says that the cash value of a person's wealth is not its true, or moral worth to him . . . the dollar that might be precious to a pauper would be nearly worthless to a millionaire. (Savage, 1954, p. 92)

From this paradox came the proposition called expected utility (EU). The subjective worth of money, it was argued, is not necessarily its objective worth. This principle remained almost dormant (Lopes, 1994, p.201; Edwards, 1954, p.29) until its re-appearance in another form in von Neumann and Morgenstern's (1944 and 1947). A consequence of axioms developed by von Neumann and Morgenstern was the proposition that a person's preferences can be represented by the utility of money and that the maximisation of EU can be a model of the person's preferences. A further extension referred to the decision-maker's attitude towards risk as risk averse. A person who is risk averse will always prefer a certain amount equal to the expected monetary value of an uncertain prospect, rather than the expected monetary value of that prospect (for example, a certain £50 rather than a 50/50 chance of £100 or 0). Utility is then a concave function of money (Pratt, 1964; Arrow, 1971).

Having met with favour in the domain of economics, the concepts of EU were broadened, most notably by Savage (1954) who replaced objective probabilities with subjective probabilities. In doing so, he was not unique. In psychology, Tversky (1967) also distinguished between 'objective' and 'subjective' probability. Tversky expressed a decision-maker's subjective expected utility as EU = $p_1u(x_1) + ... + p_su(x_j)$ where p_s was the subjectively assessed probability of the occurrence of x_j and $u(x_j)$ was its utility. Not only, therefore, was the worth of an outcome subjective, so also was the probability of the outcome. Expected utility became subjective expected utility (SEU).

The implications of the SEU theory were that just as some outcomes may be preferred over others some probabilities may be preferred over others. A series of experiments by Edwards in the 1950s, reported in both the economic and psychological literature (Edwards, 1953 and 1954), suggested 'that subjects, when they bet, prefer some probabilities to others, and that these preferences cannot be accounted for by utility considerations.' (Edwards, 1954, p.34) Decision-making under uncertainty was not as straight-forward as theretofore hypothesised.

Subjective utility implied subjective objectives. This became a coherent strand in decision theory. Allais (1953), illustrating yet another paradox of utility theory, showed that people do not conform to the constraints of EU. Using the choice of a wonderful outcome happening for certain and an even more wonderful outcome possibly happening, Allais demonstrated that people may sacrifice the even more wonderful outcome for certainty even if the certain outcome is less wonderful. The implication of such a sacrifice, is, perhaps, that people satisfice. Newell and Simon argued, in an entirely different strand of decision theory, that the large problem spaces 'associated with the problem called 'life' ' (Newell and Simon, 1970, p. 151) constrained decision-makers from processing information in a way that would allow them to optimise or 'maximise utility' and that decision-makers were destined to satisfice: to find *a* solution rather than the *best* solution.

The strands of early decision theory are regarded by Coombs and Pruitt (1960) as not reflecting theories of preference or value previously proposed by Fisher (1906) and Edwards (1953). Drawing on the notion of subjective expected utility (SEU), two concepts known as probability preference and variance preference were developed. 'It was suggested that individuals base their decisions not only on expectation but also on the dispersion of the possible outcomes, i.e for a given expectation an individual may prefer certain amounts of variance over others.' (Coombs and Pruitt, 1960, p. 265) Coombs and Pruitt studied this hypothesis and concluded (p.276) that 'while [the subject] will always prefer more expectation (other things being equal), he may have a utility for risk which will exhibit itself as a preference for certain amounts of variance or skewness.'

Interestingly in the context of capital markets and portfolio theory, Coombs and Pruitt's subjects were 'told to treat each bet separately, as if it were the only one offered. This was done in the hope

of avoiding multiple-bet strategies such as choosing a few of each kind of bet to keep a 'balanced portfolio' ' (p. 268). The study, therefore, was divorced from the context of the maintenance of a portfolio and also, perhaps, remained in the domain of single-state decision theory. The example of Coombs and Pruitt's assumptions serves to underline the primary problem of developing a research structure within the context of single-stage decision theory such as EV or EU: that it is essentially single-stage. Such theory cannot incorporate what chapter 2 argued is fundamentally an uncertain, complex world. As a result, the development of such theories are traced with a view to illuminating the origins of dynamic theories in Section 3.2.3 which attempt in some way to incorporate the infinite complexities of the environment as well as with a view to constructing detailed hypotheses or frameworks of the research.

Echoing Phillips, (1970, quoted earlier p. 55), Hampton, Moore and Thomas (1973, p. 33) conclude that 'the early interest expressed by psychologists for the relationship between 'objective' and 'subjective' probability is of limited interest today if one accepts that decision analysis requires the assessment of a probability that reflects *the beliefs of the decision maker based on the information available to him at the time of the decision* [my emphasis].' In the context of this particular discussion, we are essentially considering the constraints and characteristics of the information available to the decision-maker. In that regard, we are considering the 'problem called 'life' ': a problem which is not well represented by a single-state decision-making model:

> In real life decisions occur in sequences, and information available for later decision is likely to be contingent on the nature and consequences of earlier ones. The study of decision processes in such changing situations might be called the study of dynamic decision making. (Edwards, 1961, p.84)

In developing their decision-field theory, Busemeyer and Townsend (1993, p. 436) underline the importance of the single-state theories in the evolution of other theories of decision-making under uncertainty. Armed with the foundations of theories based on single-state decision environments, it is to the more realistic, dynamic world that we are now called.

3.2.3 The dynamic, diverse dimension

Where theories which assume single states of the world are limited in their view of the world, so also are they limited in number. Dynamic theories of decision-making are as diverse as the world which they try to describe. They draw also from a wide range of disciplines and perspectives. The perspective of this thesis is that described earlier when quoting Beaver and Anton: the uncertain context of the potential user of accounting data. In the light of that perspective, we will confine ourselves to the consideration of those theories of decision-making which shed light on uncertainty and the accounting context.

The notion of the value of accounting information was discussed in Section 2.1. Becker and McClintock (1967, p. 107) argue that

> human behaviour is governed in large by values, i.e. by the attractiveness of alternatives . . . It seems reasonable to assume that, whenever a person prefers one object or activity to another, he places a higher 'value' on that chosen as compared to the one rejected. Even when the choice is not conscious, we might assume that his preference is governed by a 'pleasure-seeking' or 'pain avoidance' principle. Yet people often make responses that are not in their best interests. They later regret that they chose a particular action. Still, it seems unreasonable to believe that they deliberately chose a response that they knew had lower value to them. It is more likely that such 'mistakes' are due to misperceptions, or to changes in the person's value system.

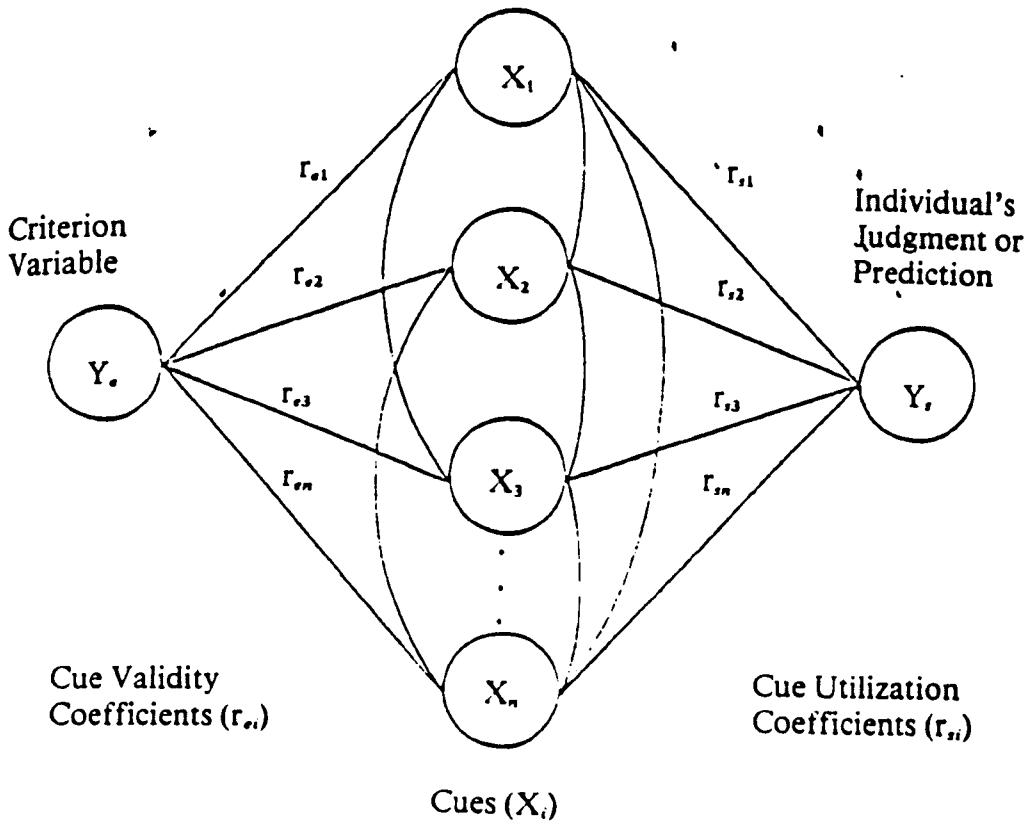
This contention brings together some of the strands of decision-theory which have been described earlier: that objectives are subjective (Tversky) and that human decision-making is limited (Newell&Simon). Furthermore, just as risk and return are two sides of the same coin, (AAA, 1972) the framework of accounting information also has (at least) two sides: firstly, the user's 'value system' (or preferences) and secondly, the user's perception (or misperception) of the

accounting (and other) information available. This is what the AAA (1973) called 'the behavioral interactions of the accounting data and the decision-maker' . . . what May and Sundem (1973) characterised in Figure 3.1 as the 'black box' of the process of transformation from an item of information to a resultant change in share price.

These 'behavioural interactions' have been represented differently by Brunswik (1952) and Litterer (1965). Brunswik's 'Lens Model' is reproduced in Figure 3.3. As chapter 4 notes, Ashton (1982) uses the Lens Model to classify behavioural studies in accounting. This model, rather than mapping the interaction between the individual and the information presented, divides the world in two 'systems': the environmental or 'predictive ability' system (the left-hand side), and the behavioural or decision-maker system (the right-hand side). Central to the model, again, is the information set (comprising various cues) available to the decision-maker (e.g. economic growth, competition, labour relations). The left-hand side is also termed the 'mechanical model' and represents the statistician's best prediction of the event to be predicted using the cues available. The right-hand side, on the other hand, is also known as the 'judgment model' or 'policy-capturing model' and is representative of the statistician's best estimate of the decision-maker's judgment. A useful example of the system is given by Hogarth (1980, p.7):

> For example, consider judgements in the form of your prediction of next year's revenue of your organisation. The first system [the left-hand side] is the economic system within which your organisation operates (including the actions taken by your organisation, competitors, etc.). This system can be said to generate (i.e. produce) the outcomes you are trying to predict, that is revenue. The second system [the right-hand side] represents your mind. It indicates the relationships you perceive or imagine between cues in the environment, e.g. anticipated trends and competitive reactions, and your prediction of revenue . . . Accuracy of prediction clearly depends on the extent to which the 'model of the environment' is matched by the 'model of the person' i.e. in terms of cues, relationships between cues, and between cues and the target event, as well as the relative importance of the cues.

Figure 3.3: Brunswik's Lens Model



On the left-hand side, the correlation or validity coefficient, r_{ie}, represents the relationship between each cue and the event to be predicted. The left-hand side may be summarised by the multiple regression equation:

$$Y'_e = b_{e1}X_1 + b_{e2}X_2 + \ldots + b_{ei}X_i$$

where Y'_e is the predicted event, X_i are the cues used and b_i is the weight assigned to each cue by the model. r_e, the relationship between Y'_e (the predicted event) and Y_e (the event itself), is a measure of environmental predictability.

The right-hand side of the model may be represented by the multiple regression equation:

$$Y'_s = b_{s1}X_1 + b_{s2}X_2 + \ldots + b_{si}X_i$$

where Y'_s is the predicted judgment, X_i are the cues used and b_i is the weight assigned to each cue by the model. r_{ei} represents the relationship between each cue and the decision-maker's judgment. r_s measures the extent to which Y'_s (the predicted judgment) differs from Y_e (the judgment itself) and is considered a measure of the decision-maker's consistency.

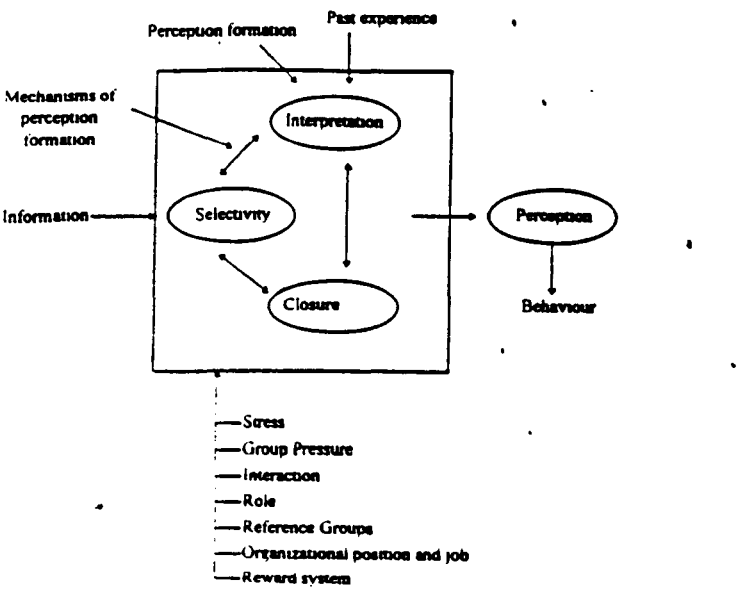
The model, first developed in 1940, has undergone several interpretations and refinements in the intervening period. Hogarth (1980, p. 9) concludes that 'through the conceptual device of Brunswik's lens model - that accuracy of judgment depends upon the extent to which the mind mirrors the environment it attempts to predict.' Belkaoui (1989, p. 5) develops the model further: 'assuming nonlinearity is negligible, the lens model equation explains achievement as follows:

$$r_a = GR_eR_s$$

In other words, achievement [r_a] depends on accuracy of cue weighing [G], predictability of the environment or predictive ability of the information [R_e], and predictability of the individual [R_s] (consistency).'

Litterer's model, shown in Figure 3.4, attempts to map the manner in which perceptions are formed. Information (e.g. accounting data) and past experience (of the decision-maker) are the inputs to the model. These inputs are distilled by three 'mechanisms' of perception - selectivity, interpretation and closure.

Figure 3.4: Litterer's Model of Perception Formation (Litterer, 1965, p. 64)



Kast and Rosenzweig (1970, pp. 217-218) discuss these mechanisms in the following terms:

> The concept of selective perception is important because voluminous information is received and processed. Individuals must select information which is supportive and satisfying.
>
> The same stimulus can be interpreted differently by several individuals. Interpretation depends on past experience and the value system of each particular person. An attitudinal set or propensity to think or act in a certain way provides a framework for interpreting various stimuli. Not only does the individual perceive selectively, he interprets the situation in ways which will be supportive.
>
> The process of closure in perception formation related to the tendency of individuals to have a complete of any given situation. Thus a person may perceive more than the information seems to indicate. He adds to the information input whatever seems appropriate in order to close the system and make it meaningful . . . Closure and interpretation have a feedback to selectivity and hence affect the functioning of this mechanism in subsequent information processing.

In describing these mechanisms, Kast and Rosenzweig (1970) underline the importance of the information input and the decision-maker's past experience in moulding the processes (or mechanisms) that ultimately create the decision-maker's perception of the information input. Selection is made by the decision-maker of information which is 'supportive and satisfying'. (Brock, Albert and Becker (1970) argue that this selection is of information that is 'novel' and 'useful'.) The interpretation of the information input is made on the basis of 'the past experience and values of each particular person' (Kast and Rosenzweig, 1970, p. 218).

Both of these mechanisms reflect what Becker and McClintock (1967) described as the factors governing human behaviour: the attractiveness of alternatives which is a function of the values of

the decision-maker. The concept of closure is an important one in that it suggests that the information set, as presented, is in some way incomplete and requires the use of inferences or other sources of information in order to 'close' or complete the set. Such 'inferences may be based on direct observation of events or on reports from indirect sources about the occurrence of events' (Snapper and Fryback, 1971, p. 401). The existence of an incomplete information set and the proposition that this in itself leads to some form of ambiguity or uncertainty is an important one which is central to the development of the hypotheses of this thesis in chapter 6. These ideas regarding the role of the decision-maker, the importance of prior expectations and the context of the decision contribute in particular to the disclosure of uncertainty adopted in chapter 5, the hypotheses in chapter 6 and the testing of such disclosures in chapters 9 and 10 in particular. The next section (Section 3.2.3.1) introduces some further elements of decision theory, extending those discussed thus far, which will also contribute to the development and testing of the research hypotheses.

3.2.3.1 Impreciseness, Incomplete Information and Ambiguity

Of note in the context of this thesis is the importance placed by Brunswik and others on the environment and the characteristics of the environment in decision-making, a distinction not made by Litterer whose model considers information and the past experience of the decision-maker as inputs to the process of perception. Both models distinguish clearly between the environmental cues / information and the decision-maker, what Lenzen (1952, pp. 29-30) calls the 'partition between object and observer'. Brunswik in a section called '*The 'World of Things' and its Residue of Ambiguity* (1952, p. 7) argues that

> one of the most cogent reasons for the conceptual separation of stimulus and response in the psychology of perception is the fact [represented by both the Lens model and Litterer's model] that the cognitive mechanism is far from perfect or fool-proof.

We have therefore observed that not only are expected utilities subjective but that, because of the 'partition between object and observer' (Lenzen, 1952, pp. 29-30), information may indeed contain

a 'residue of ambiguity'. Dermer (1973, p. 512) defines ambiguity as 'uncertainty of meaning, and ambiguous situations are those which cannot be adequately structured or categorised by an individual.' Nurmi (1983, p. 106) distinguishes between 'impreciseness due to randomness' and 'impreciseness due to the employment of inexact notions . . . i.e. impreciseness due to fuzziness.' He also distinguishes between three 'sub-types' of impreciseness - ambiguity, randomness and vagueness. Vagueness 'may concern concepts or sentences' while with ambiguity 'the concept in question lacks univocal meaning.' The consequence of such theories of ambiguity has been the development of theories concerning 'decision-weights' which attempt to take account of ambiguity.

The notion of decision-weights arises from yet another paradox - the Ellsberg paradox. Ellsberg (1961) argued that probabilities in themselves do not completely represent the various uncertainties encountered by decision-makers. Ellsberg creates the scenario of two urns, each containing 100 red and black balls. The proportion of red balls to black balls in Urn 1 is unknown while there are 50 red balls and 50 black balls in Urn 2. A gamble is offered giving £100 if one bets on red and red is drawn from an urn; likewise for black. One gets nothing if one bets on the wrong colour. Most decision-makers would be indifferent between bets in the same urn i.e. between red and black in Urn 1 or between red and black in Urn 2. However, when offered a choice between urns (i.e. between red in Urn 1 and red in Urn 2 or black in Urn 1 and black in urn 2), Ellsberg suggests that most decision-makers prefer Urn 2 (with a 50/50 chance) to Urn 1 (with an unknown chance). Uncertainty about uncertainty (called 'probability of probabilities' by Marschak (1975)) is an influential characteristic of the decision context. It adds to what Ellsberg (1961) and Fellner (1961) call the 'ambiguity' of that context. This in turn may effect 'expressed confidence in estimates'. The hypotheses set out in chapter 6 and explored in chapters 8 to 11 draw on such suggestions concerning confidence:

> Ambiguity is a subjective variable, but it should be possible to identify 'objectively' some situations likely to present high ambiguity, by noting situations where available information is scanty or obviously unreliable or highly conflicting; or where expressed expectations of different individuals differ widely; or

> where expressed confidence in estimates tends to be low. Thus, as compared with the effects of familiar production decisions or well-known random processes (like coin-flipping or roulette), the results of Research and Development, or the performance of a new president, or the tactics of an unfamiliar opponent are all likely to appear ambiguous. (Ellsberg, 1961, pp. 660-661)

To such ambiguous situations could be added the financial reporting process. Not only can the environment be risky and uncertain but the perception of it and the communication of such risk can have an uncertainty of its own particularly in the manner currently suggested for such disclosures. Chesley (1976, p. 27) points out that in the absence of a relative frequency of probabilities with which to objectively determine probability, the determination and communication of probabilities (as well as reaction to it) is subjective. Furthermore, Chandra (1974, p. 741), in a questionnaire-based study, found that 'accountants generally do not value information for equity investment decisions the same as security analysts do', a finding supported in an accountant / auditor versus banker / analyst study by Firth (1978). Thus, when the AAA (1971) writes about the 'behavioural interaction between the information data and the decision-maker' it can only be just that: a form of interaction. Viewing the company through the eyes of management is a more complex process than Dieter and Sandefur (1989, p. 70) quoted earlier seem to suggest.

Decision-makers act as what Hogarth (1975, p. 271) calls 'intuitive statisticians'. Hogarth goes on to say that 'from the assessor's viewpoint no assessment can be 'wrong' provided it is coherent and effected with due care and consideration of all known, relevant facts . . . However, from the viewpoint of the assessor - and sometimes to the assessor himself - probability assessment might seem to be more or less accurate in the light of subsequent events.' In a comprehensive review of research concerning itself with the cognitive processes of man as the intuitive statistician, Hogarth refers to the consequences of Newell and Simon's characterisation of man as having limited information processing capacity. These consequences resemble those modelled by Litterer:

> In summary, man is a selective, stepwise information-processing system with limited capacity, and, as I shall argue, he is ill-equipped

> for assessing subjective probabilities distributions. Furthermore, man frequently just ignores uncertainty . . . Given limited information processing ability, man clearly needs to structure his environment. The organizing 'Gestalt' forces of symmetry, closure, proximity, good continuation and common fate are powerful and, it seems, not restricted to the perceptual domain. Furthermore, they abhor randomness. (Hogarth, 1975, p. 273)

This abhorrence of randomness has been observed in chess and music. The fact that (in chess) the human 'does not have the speed, memory or precision of organization to examine 800,000 moves' (Newell and Simon, 1972, p. 707) means that 'people appear to have a strong propensity, whether innate or learned, to discover patterns in temporal sequences presented by the environment, and to use these evidences of pattern for prediction . . . The urge to find pattern extends to phenomena where one may well doubt whether a pattern exists (e.g. in the movements of the stock market).' (Simon and Sumner, 1968, p.220)

A study of such urges was carried out by Eggleton (1976 and 1982). Eggleton's hypothesis can be inferred from the title of his paper *Patterns, Prototypes and Predictions*: that in making predictions people seek patterns of which central tendency and variability are prototypical. Eggleton concludes that subjects' decision-making behaviour is characterised by a search for patterns based on an assessment of the central tendency of (in this instance) a time-series. Subjects distinguished between a pattern which they perceived as random and one which they perceived followed a trend. Where the time series was random, a prediction was based on the observed central tendency. When there was a trend in the series, subjects' predictions were based on an upward adjustment of the central tendency or on more recent observations.

Such problem-solving behaviour has been termed 'heuristic search' (Newell and Simon, 1972, p. 101). Returning to the theories in Newell and Simon's *Human Problem Solving* and in particular the importance of 'problem-space' in the context of problem-solving:

> Problems with immense spaces inform us that the amount of search required to find solutions, making use of available structure [or

> pattern] bears little or no relation to the size of the entire space. To a major extent, the power of heuristics resides in their capability for examining small, promising regions of the entire space and simply ignoring the rest. We need not be concerned with how large the haystack is, if we can identify a small part of it in which we are quite sure to find a needle' (Simon & Newell, 1970, p. 151)

Heiner (1983, p. 585) calls such heuristics 'smaller behavioural repertoires' which are used because the decision-maker 'cannot decipher all the complexities of the decision-problems they face [the 'immense problem spaces' described by Newell and Simon], which literally prevents them from selecting most preferred alternatives.' Early attempts at the development of heuristics as explanations of behaviour in the face of uncertainty have proved robust. They have provided a foundation for broader theories of behaviour in the context of uncertainty. The following section charts the development and extension of such theories of decision-making from theories of heuristics and biases.

3.2.3.2 Judgment under Uncertainty: Heuristics and Biases

Recognising that the 'assessment of uncertainty is often based on the intuitive judgments of human beings', Tversky (1974, pp. 148 & 156) draws on research by Kahneman and himself to describe

> three heuristics, or mental operations, that are employed in judgment under uncertainty. (i) An assessment of *representativeness* or similarity, which is usually employed when people are asked to judge the probability that an object or event *A* belongs to a class or process *B*. (ii) An assessment of the *availability* of instances or scenarios which is often performed when people are asked to assess the frequency of a class or the plausibility of a particular development. (iii) An *adjustment* from a starting point [or 'anchor'], which is usually employed in numerical estimation when a relevant value is available [my emphasis].

These heuristics are discussed in more detail in Kahneman, Slovic and Tversky's *Judgment under uncertainty: Heuristics and Biases* (1982). They are considered here only to the extent that they contribute directly or indirectly to the development of this thesis. Specifically, the *representativeness* heuristic contributes to hypotheses in chapter 6 concerning the effect on perception of characteristics (such as high gearing and high growth) of the reporting entities. The *adjustment* heuristic leads to theories of decision-making in the context of gains and losses. This contributes to the design of the research instrument in chapter 7. Moreover, these ideas advance the general consideration of broader theories of decision-making under uncertainty such as Kahneman and Tversky's Prospect Theory.

Piaget (1951, p. 3) hypothesises 'there is representation when an absent model is imitated'. Representativeness is illustrated by Tversky and Kahneman (1982, p. 4) with the following example:

> Consider an individual who has been described by a former neighbour as follows: 'Steve is very shy and withdrawn, invariably helpful, but with little interest in people, or in the world of reality. A meek and tidy soul, he has a need for order and structure, and a passion for detail.' How do people assess the probability that Steve is engaged in a particular occupation from a list of possibilities (for example, farmer, salesman, airline pilot, librarian, or physician)? How do people order these occupations from most to least likely? In the representativeness heuristic, the probability that Steve is a librarian, for example, is assessed by the degree to which he is representativeness of, or similar to, the stereotype of a librarian.

In another instance, pertinent in the context of business, Kahneman and Tversky (1972, p. 451) write that 'in thinking about the chances that a company will go out of business . . . we have in mind a model of the company . . . and we evaluate as most likely those outcomes which represent the essential features of the corresponding model.' Rather than utilising 'the appropriate formal rule' (Snapper and Fryback, 1971, p. 401) of Bayes' Theorem and prior probabilities, man 'is not Bayesian at all' (Kahneman and Tversky, 1972, p. 450).

Johnson, however, (1983, p. 92) in an experimental setting 'raises several questions about the descriptive accuracy of the representative heuristic' alone in the very context of predicting corporate bankruptcy. On the other hand, Slovic and Lichtenstein (1971) summarise several studies confirming representativeness while Swieringa, Gibbins, Larsson and Sweeney (1976, pp. 181-182) postulate that 'people's use of the representativeness heuristic may represent a simplification of, rather than a departure from, the normative Bayesian approach.' Tversky makes a defence of the embattled decision-maker which is very pertinent in the context of the disclosure of information regarding probabilities and risk when he writes (1974, p. 157) that 'the failure to develop valid statistical intuition is probably due to the fact that events are normally not coded in a manner that is conducive to the learning of statistical rules ... When events are coded into natural categories, the probabilities or relative frequencies of these categories are learned without difficulty.' (Tversky, 1974, p. 157)

It would appear that the process of aggregation and communication of 'fallible information' has implications for the manner in which information is used in decision-making, implications that will be discussed later in this section. Further, this process contributes to the specific hypotheses of the research developed in chapter 6. In particular, they are important in the context of the effect (if any) of the disclosure of the uncertain nature of financial statements on perceptions of performance and position of the reporting entity explored in chapter 8. In addition, particular reported entities may be perceived as representing other 'absent' categories of reported entities which in turn may fashion perceptions. This influence on perception will form the foundation for hypotheses (discussed in section 6.2.3 and examined in section 8.3.3) concerning the importance of the characteristics of the reporting entity in the assessment of performance and position.

Another heuristic postulated by Kahneman and Tversky is the adjustment heuristic, also called anchoring and adjustment. 'In many situations, people make estimates by starting from an initial value that is adjusted to yield the final answer.' (Tversky and Kahneman, 1982, p.14) The heuristics described thus far represent rules relied on by decision-makers to infer probability, or close the information set, in the absence of complete information. They do not form a

comprehensive theory of decision-making under uncertainty. The anchoring and adjustment heuristic does, however, link these descriptions with attempts to describe in a more comprehensive way decision-behaviour under uncertainty. These theories include those of Keynes, Kahneman and Tversky's and Einhorn and Hogarth. 'Anchoring and adjustment' and its contribution to such theories, as well as these theories themselves, are explored further in the following sections.

3.2.3.3 Keynes and Probability

One of the early proponents of such theories was Keynes (1921). Considering both randomness and ambiguity, he argues (p. 344) that

> the doctrine that the 'mathematical expectations' of alternative courses of action are the proper measures of our degrees of preference is open to a certain amount of doubt on two grounds - first because it ignores what I have termed . . . the 'weights' of the arguments, namely, the amount of evidence upon which each probability is founded; and, second, because it ignores the element of 'risk' and assumes that an even chance of heaven or hell is precisely as much to be desired as the attainment of a state of mediocrity.

With regard to the lack of consideration of the 'weights' of the argument, Keynes asks (p. 345) 'if two probabilities are equal in degree, ought we, in choosing our course of action, to prefer that one which is based on a greater degree of knowledge? . . . the degree of completeness of the information upon which a probability is based does seem to be relevant, as well as the actual magnitude of the probability, in making decisions.' Keynes (p. 348) then develops a decision rule which he calls a 'conventional coefficient of risk and weight' denoted as c. The rule replaces the conventional rule that

$$EV = p_1x_1 + \ldots + p_sx_j$$

with

$$EV = c_1x_1 + \ldots + c_sx_j \text{ where } c = \frac{2pw}{(1+q)(1+w)} \qquad 0 \leq c, w, p, q, \leq 1$$

and where p = the probability of success, q = the probability of failure ($p + q = 1$) and w = the 'weight of evidence'. w could also be termed a measure of ambiguity or incompleteness of the information (Brady and Lee, 1991, p. 244). The more vague the information, the lower the value of w and consequently the less certain the outcome. Keynes (1921, p. 347) concludes that 'there seems, at any rate, a good deal to be said for the conclusion that, other things being equal, that course of action is preferable, which involves least risk and about the results of which we have the most complete knowledge'. Commenting on Keynes' decision rule, Brady and Lee (1991, p. 250) offer the opinion that it is 'at *least* equal in explanatory power, simplicity of use, and generality to any other 'modern' decision rule or approach, be it Kahneman and Tversky's or Einhorn and Hogarth's.'

3.2.3.4 Kahneman and Tversky's Prospect Theory

Kahneman and Tversky's seminal discussion of Prospect Theory (1979) begins (pp. 263-264) with a critique of EU theory, describing EU theory as based on three tenets:

> (i) Expectation: $U = p_1\, u(x_1) + \ldots + p_s\, u(x_j)$.
>
> (ii) Asset integration: $(x_1, p_1; \ldots ; x_j, p_s)$ is acceptable at asset position w if and only if $U(w + x_1, p_1; \ldots w + x_j, p_s)$.
>
> That is, a prospect is acceptable is acceptable if the utility from integrating the prospect with one's assets exceeds the utility of those assets alone. Thus, the domain of the utility function is final states (which include one's asset position) rather than gains or losses . . .
>
> (iii) Risk aversion: u is concave ($u'' < 0$).

Kahneman and Tversky argue that these tenets are violated by several phenomena or effects:

a) the certainty effect where certain outcomes are overweighed relative to outcomes which are merely probable (also known as Allais' paradox (after Allais (1953) and discussed earlier).

b) the reflection effect whose implications are that risk aversion when outcomes are expressed as gains (the positive domain) is accompanied by risk seeking when outcomes are expressed as losses (the negative domain) and that preferences are therefore inconsistent with EU theory.

c) the isolation effect (another form of heuristic previously described by Tversky (1972)) where decision-makers disregard aspects of choices that are common among alternatives to simplify choice.

A central and crucial component of Kahneman and Tversky's critique of EU theory draws on earlier work by von Neumann and Morgenstern (1947) and Markowitz (1952). 'People normally perceive outcomes as gains and losses, rather than as final states of wealth and welfare. Gains and losses, of course, are defined relative to some neutral reference point [or 'anchor'?]. The reference point usually corresponds to the current asset position, in which case gains and losses coincide with the actual amounts that are received or paid.' (Kahneman and Tversky, 1979, p. 274) This contention conforms to studies carried out by Slovic (1967) and Slovic and Lichtenstein (1968) who found that decision-makers 'were choosing according to rules such as 'minimize possible loss' or 'maximize possible gain' rather than basing their preferences on variance per se' (Slovic, 1972, p.794). Thus, riskiness is not perceived as a function of variance (as was suggested, for example, by Coombs and Pruitt (1960) and Eggleton (1976)) but as the amount of the loss and the probability of loss.

These findings have also been supported by MacCrimmon and Wehrung (1986) and March and Shapira (1987). The former conclude (p. 268) that 'the most common two-stage decision-thinking used the attributes 'chance of major gain' as the constraint and the 'expected return' as the goal.' The latter, in two studies of risk perceptions by managers, found (p. 1407) that 'risk is seen as associated with negative outcomes' rather than with what Kahneman and Tversky phrase 'final states of wealth and welfare.'

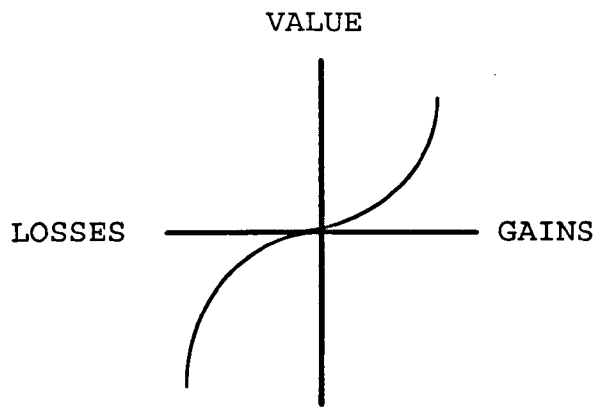
The manner in which choices are made is divided into two phases by Kahneman and Tversky: the editing phase and the evaluation phase. The editing phase consists of several operations which are themselves a form of heuristics. These operations 'organize and reformulate the options so as to simplify subsequent evaluation and choice.' (Kahneman and Tversky, 1979, p. 274) The editing phase is followed by the evaluation phase. Having reduced and redefined the choices available, the decision-maker is faced with the task of attaching a value to each choice. This evaluation phase is

where Kahneman and Tversky's Prospect Theory is particularly useful in the context of the reporting of information. It contends that the value, v, attached to each choice by the decision-maker is a function of the value scale and, a crucial addition first mooted by Edwards (1962) (and in another way, Keynes (1921)) a 'decision-weight'.

The value scale, v, comprises two arguments: 'the asset position that serves as a reference point, and the magnitude of the change (positive or negative) from that reference point.' (Kahneman and Tversky, 1979, p. 277) . This has parallels with the anchoring and adjustment heuristic: starting at an initial value that is adjusted to yield the final answer. The value scale, v, assigns a number $v(x)$ to each outcome which represents the subjective value of that outcome to the decision-maker. This value function challenges EU theory's tenet that the decision-maker is risk-averse (that u is concave ($u'' < 0$)) by arguing that decision-makers are generally risk averse in the domain of gains and risk-seekers in the domain of losses. As a result of this finding, the research framework developed in chapters 5 and 7 will focus on the disclosure of losses only rather than gains and losses.

Kahneman and Tversky (p. 279) summarise their proposal in this regard as follows: 'the value function is (i) defined on deviations from the reference point; (ii) generally concave for gains and convex for losses; (iii) steeper for losses than for gains.' A value function representing these three properties is given in Figure 3.5.

Figure 3.5: Kahneman and Tversky's Value Function (Kahneman and Tversky, 1979)



The latter characteristic is supported by Galanter and Pliner (1974, p. 75) who contend that the pain of losing a sum of money seems greater than the pleasure of winning the same amount. Becker and McClintock (1967) alluded to preferences governed by 'pleasure-seeking' and pain-avoidance' and subsequent regret. Such tendencies are further explained by Bell (1982) and Loomes and Sugden (1982) through what they call 'Regret Theory'. Loomes and Sugden (p. 822) suggest that a significant influence in situations of uncertainty 'is an individual's capacity to anticipate feelings of regret and rejoicing.' They argue that their theory explains a rational form of behaviour although the behaviour contravenes the axioms of EU theory.

The development by Kahneman and Tversky of the concept of decision-weights is a response to influences on the decision-context other than ambiguity. However, 'the theory can also be extended to the typical situation of choice where the probabilities of outcomes are not explicitly given.' (Kahneman and Tversky, 1979, p. 288) Decision weights (termed *np*), they write (p. 280), 'measure the impact of events on the desirability of prospects, and not merely the perceived likelihood of these events.' The properties of the weighting function are characterised by Kahneman and Tversky as:

- n is an increasing function of p, with $n(0) = 0$ and $n(1) = 1$.
- very low probabilities are generally over-weighted, that is $n(p)>p$ for small p.
- n is not well-behaved near the end-points (i.e. where $0\sim p\sim 1$).

- for all $0<p<1$, $n(p)+n(1-p)<1$ (called 'subcertainty'). In other words, the sum of the weightings of the prospects being considered may be less than 1, implying an uneasiness regarding the outcome, any outcome, being considered.

This latter property is significant in considering ambiguous situations as the weights attached to particular events in such situations 'exhibit the essential properties that were ascribed to the weighting function. For example, if A and B are complementary events and neither is certain, $n(A)+n(B)$ should be less than unity - a natural analogue to subcertainty . . . Indeed, the work of Ellsberg and Fellner implies that vagueness reduces decision weights. Consequently, subcertainty should be more pronounced for vague [or inferred probabilities as in the financial reporting context] rather than for clear probabilities' (Kahneman and Tversky, 1978, pp. 288-289). These ideas of 'subcertainty' touch again on the effect of ambiguity and uncertainty on confidence which is hypothesised in chapter 6.

3.2.3.5 Einhorn and Hogarth's Venture Theory

Einhorn and Hogarth's 'version of the ambiguity model . . . bears a striking resemblance to the decision-weight function of Prospect Theory.' (Einhorn and Hogarth, 1986, p. 235). Their model also attempts to explain Ellsberg's paradox but primarily recalls the historical development of decision theory by attempting 'to explore the nature of probability * utility interactions' (Hogarth and Einhorn, 1990, p. 781) In doing so, it offers us a context in which to explore the behavioural interactions of 'accounting data and the decision-maker' (AAA, 1971) in the context of risk and uncertainty. It was noted earlier that models of decision-making under uncertainty draw to a certain extent on Kahneman and Tversky's anchoring and adjustment heuristic. This is particularly so in the case of Einhorn and Hogarth's Venture Theory. Where Kahneman and Tversky refer to their representativeness and adjustment heuristics as using 'mental effort - in one form or another' (1972, p. 452), Einhorn and Hogarth (Hogarth and Einhorn, 1990, p. 783) refer to a fundamental part of their Venture Theory as 'mental simulation.' Furthermore, their 'model postulates an *anchoring-and-adjustment* strategy for assessing probabilities. This involves an initial assessment

denoted p_A and an adjustment to reflect the ambiguity in the situation.' (Einhorn and Hogarth, 1985, p. 436)

This process is denoted by the equation

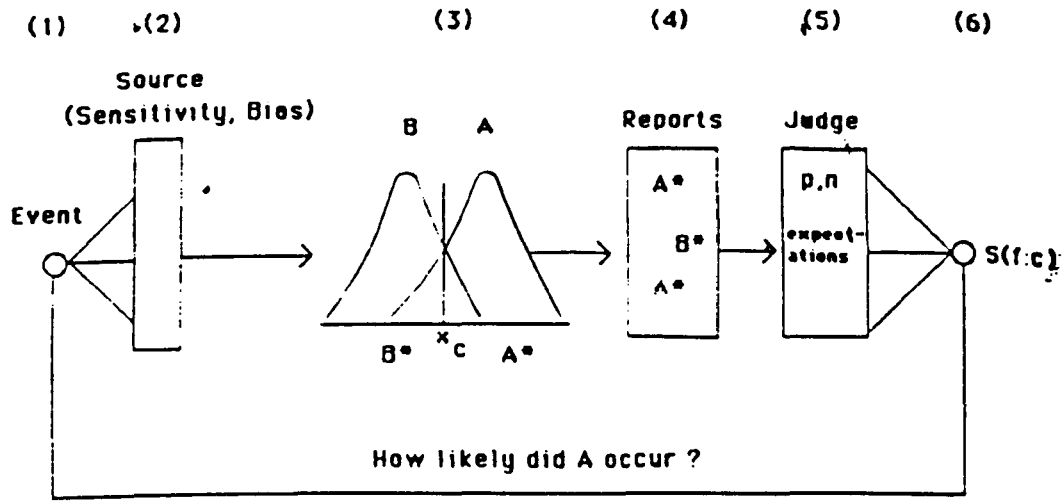
$$S(p_A) = p_A + k,$$

where $S(p_A)$ represents the judgment resulting from the strategy adopted and k is the net effect of the adjustment process from the anchor p_A. Einhorn and Hogarth (1985, p. 436-437) argue that the adjustment, k, is affected by three factors:

1. The level of p_A; that is because $S(p_A)$ varies between 0 and 1, [the equation] implies that $-p_A \leq k \leq (1-p_A)$. This means that the direction of the adjustment must be due, in part, to the value of p_A. Indeed, when $p_A = 0$, $k > 0$, and the adjustment (if there is one) must be upward; when $p_A = 1$, $k < 0$, so that the adjustment must be downward; when $p_A \neq 0, 1$, adjustments can be up or down.
2. The amount of ambiguity perceived in the situation. This affects the absolute size of the adjustment that is captured by a parameter θ ($0 < \theta < 1$); that is the greater the perceived ambiguity, the larger the adjustment.
3. The person's attitude toward ambiguity in the circumstances. This is reflected in the tendency to give differential attention or weight to values of p that are greater or smaller than the initial estimate, p_A. Attitude toward ambiguity is denoted by b, and this parameter, together with p_A, determines the sign of the net effect of the adjustment (i.e. when k is positive or negative).

The authors then go on (p. 440) to develop a schema of the inference or closure of the information set involving 'a judge assessing the likelihood of the occurrence of an event based on reports received from a source of limited reliability', what Cohen (1964, Chapter 2) calls 'weighing the evidence'. This schema (Figure 3.6) is particularly appropriate in the context of a discussion 'identifying the principal risks and uncertainties in the main lines of business, together with a commentary on the approach to managing these risks and, in qualitative terms, the nature of the potential impact on results' (ASB, 1993a, para. 12) in a voluntarily prepared and unaudited OFR.

Figure 3.6: Einhorn and Hogarth's decision-making schema (Einhorn and Hogarth, 1990)



The task identified has the following elements (from Einhorn and Hogarth, p. 440):

(1)An event occurs.

(2)The event is sensed by the observers (e.g. witnesses to an accident, [or e.g. the directors of a reporting entity]) who, in principle, can be characterised by levels of sensitivity and bias which are unknown to the judge . . .

(3) The observers report what they saw [e.g. in the financial statements]. A* denotes the report of Event A, and B* denotes the report of Event B, where the decision rule is to report A* if the observation is above some critical value X_c, [materiality, SSAP 18's 'likely' etc.] and B otherwise. The reports can therefore be conceptualised as coming from a signal-detection task.

(4) Because there are *n* observers, *n* reports are collected. These reports can be thought of as outcomes of *n* observers reporting on a single trial in a single-detection task. Furthermore, because we do not differentiate between the *n*

observers, we refer to them as coming from a single source [e.g. the financial statements].

(5) The judge receives the information in the form of f reports for a hypothesis (i.e., f reports of A*) and c reports of an alternative (i.e. c reports of B*), where $f + c = n$, and $p = f/n$. The content of the scenario, however, is assumed to give the judge some information as to what values of p to expect in a sample size of n. Specifically we argue that expectations concerning p are influenced by (a) the dissimilarity between Events A and B and (b) the credibility of the source.

(6) The assessment of the likelihood of A results from the combining of p and n with one's expectations concerning the range of possible values of p.

The fifth and sixth elements of the schema give the process the attributes of risk (rather than uncertainty) disclosure given Edwards' definition of risk and uncertainty.

The model recognises three distinct sources of ambiguity:

1. the dissimilarity between Events A and B,
2. the credibility of the source, and
3. the number of reports, or sample size, n.

The importance of the credibility of the source in the decision-making process informs the development of the context of the research in chapter 5. In particular, the potential for elements of the annual report (such as, for example, the Chairman's Statement / OFR and the balance sheet and profit and loss account) to differ in credibility means that the research will be framed around the financial statements themselves rather than those other elements of the annual report.

Extending their theory further (and bringing it closer to a usable model of reporting), Hogarth and Einhorn (1990, p. 783) write that the initial value of the probability (the anchor, p_A) 'may be a figure based on historical data [time series of reported numbers], provided by experts [directors or their advisers], or a judgment founded on other sources of information including memory.' The amount of mental simulation involved in the adjustment is a function of outcome uncertainty, the size of payoffs, and ambiguity, and the direction of the adjustment is a function of the location of p_A and the relative weight given to imaginary (or Kahneman and Tversky's available) values above or

below p_A. The latter is quite similar to Kahneman and Tversky's decision weights in that the 'weighting of values above or below the anchor' (Hogarth and Einhorn, 1990, p. 793) is affected by individual differences and the context of the decision.

Einhorn and Hogarth's proposition is similar to both Keynes' decision-rule and Kahneman and Tversky's Prospect Theory. At the heart of all three theories is the contention that 'ambiguity' or 'vagueness' affects the perception of choices faced by decision-makers. This ambiguity writes Ellsberg (1961, p. 658) is 'a quality depending on the amount, type, reliability and 'unanimity' of information, and giving rise to one's degree of 'confidence' in an estimate of relative likelihoods.' Ambiguity informs the decision-makers' assessment. It also contributes to their degree of confidence in their assessment or perception. Continuing the exploration, this confidence is a function of ambiguity which in itself is a function of the amount, type, reliability and unanimity of information. In this context lies a focus for the consideration of the usefulness and value of disclosures of information concerning probabilities and uncertainty in annual reports.

This issue is discussed by Kahneman and Tversky and Einhorn and Hogarth in the domain of their own theories. Such discussion takes the form of an attempt to formulate attitudes toward uncertainty and ambiguity. Kahneman and Tversky challenge the postulates of classical decision theory, arguing as outlined earlier, that the utility curve is not concave but is concave for gains and convex for losses. Hogarth and Einhorn (1990, p. 788) 'specify further' Kahneman and Tversky's contention and conclude that

> for gains, there are two forces that induce tendencies toward risk aversion. These are the concavity of [Kahneman and Tversky's] prospect theory function, and the general underweighting of probabilities of probabilities implied by the venture function ... For losses, there are two forces that conflict in their impact on risk attitudes. On the one hand, the convex nature of the prospect theory value function over losses implies risk seeking. On the other ... probabilities are generally overweighed thereby implying a force toward risk aversion.

These elements of the decision theories outlined will fashion a research approach in chapters 5, 6 and 7 which will, for example, (because of the asymmetry of attitude to gains and losses) be restricted to the consideration only of losses while at the same time will question (in chapter 10) the rationale of the prudence concept of asymmetrical treatment of assets and liabilities. The research instrument in chapter 7 will also encompass measures of attitude toward the information source that is the financial statements. Building on the theories concerning, for example, cue weighting, the research will explore the effect on decision-making of differences in attitude toward financial statements. Further, reliability of source will be controlled by ensuring that the information disclosed arises from the audited elements of financial statements.

It is clear that attitude to risk is a complex conundrum. Schoemaker (1990, p. 1451)

> writes that numerous theories and experiments have attempted to describe people's risk-taking behaviour in both simple and complex tasks . . . The limitations of existing models suggest that risk-taking entails a broad range of factors . . . belief differences, aspiration levels, value differences, context and process factors, as well as portfolio considerations.

Supporting Schoemaker's view, Lipshitz (1993, p. 103) argues that the answer to the question 'how do people actually decide in realistic settings?' is to a great extent context-dependent. It is to work carried out in the organisational and accounting context that we now turn. This context is considered, first, in the broad framework of decision-making in the next section, and second, in specific studies of decision-making in the light of accounting information concerning uncertainty in the chapter 4.

3.3 THE COGNITIVE CONTEXT

Russell and Montague-Jones (1990, p. 5) estimate that 65% of UK listed companies are owned by institutional investors. Sheridan and Kendall (1992, pp. 92-93) quote a survey in *The Independent* newspaper which 'reckoned that private individuals owned only 16.1 per cent of equities on the London stock exchange in 1991 . . . Every major company's report and accounts confirms this.'

When discussing the context of the use of financial reports, the institutional context is, therefore, important. This section will review the research carried out in a general institutional context. Chapter 4 will then discuss work carried out in the particular context of accounting and investment decision-making leading to the establishment of the hypotheses of the research in chapter 6. These hypotheses will draw on the theories discussed in this chapter.

3.3.1 The organisational / institutional context

Studies of risk-taking and perception in organisational contexts have been carried out by March and Shapira (1987 and 1992) and MacCrimmon and Wehrung (1986). March and Shapira (1987, p. 1409) found that 'managerial risk taking propensities vary across individuals and across contexts.' However, motivational factors discovered by them indicate 'a greater variation in risk taking attributable to contextual factors.' This was supported by MacCrimmon and Wehrung (1987, p. 125) who found 'a greater willingness to take risks in business gambles than in personal gambles based on our assessment of their comparability. However, the observed differences in risk propensity may be due to differences in the perceived differences of these investments rather than differences regarding personal and business responses.'

March and Shapira (1987, p. 1410) summarise early studies of risk taking by managers which found that

- managers avoid risk rather than accept it (Cyert and March, 1963)
- they delay decisions and delegate them to others (MacCrimmon and Wehrung, 1986)
- they believe that risks can be reduced by using skills to control the dangers (Strickland, Lewicki and Katz, 1966)
- they try to modify the risk descriptions, partly by securing new information, partly by attacking the problem with different perspectives.

March and Shapira's work focuses to a greater extent on risk-taking rather than risk perception, on action more than thought. As such, it allows us to advance our consideration of risk disclosures from cognition to action. They agree not only that managers fail to follow the canons of decision

theory, but also that the ways they think about risk do not easily fit into classical theoretical conceptions of risk .

These observations make standard conceptions of risk, with their emphasis on trait differences among individual decision makers (e.g. Hogarth and Einhorn (1990, p. 783) 'individual differences') problematic as bases for talking about managerial risk taking behaviour. To a substantial extent, probability estimates are treated as unreliable and subject to post-decision control, and considerations of trade-offs are framed by attention factors that considerably affect action. Managers look for alternatives that can be managed to meet targets, rather than assess or accept risks. (1987, p. 1414)

This tendency to view as the achievement or non-achievement of a target return is also commented on by Steil (1993) in the institutional context of foreign exchange risk management and is supported by empirical evidence from Fishburn (1977), Laughhunn, Payne and Crum (1980) and Holthausen (1981). It is somewhat similar to the theories of Kahneman and Tversky and Einhorn and Hogarth in that risk is assessed based on an adjustment from an anchor, but the anchor is a target return rather than current position or a reported probability. This again echoes the findings of MacCrimmon and Wehrung (1986, p. 151) who conclude that 'expected gain and loss provided considerable power in explaining the rankings' of (albeit personal) investment alternatives. This transforms the definition of risk from the classical one of variability of returns through Prospect Theory's risk of a gain or loss to one which views risk as the probability of earning a return above or below a target level. It corresponds to a heuristic commented on by Newell and Simon (after Duncker, 1945):

> The particular heuristic system that finds differences between current and desired situations, finds an operator relevant to each difference, and applies the operator to reduce the difference is usually called means-ends analysis . . . Our own data analyses reveal means-ends analysis to be a prominent form of heuristic organization in some tasks - proving theorems, for example. (Newell and Simon, 1970, p. 152)

March and Shapira's findings are also somewhat similar to Kahneman and Tversky's, as they find that the utility curve (or attitude to risk) is not concave. Instead of finding that decision makers are risk averse for gains and risk seekers for losses from the decision maker's current position, however, March and Shapira argue that decision makers are risk averse above the target (or aspiration) level and risk averse below the target level. This also, it would appear, has implications for attitude towards ambiguity:

> as a risk-taker's resources (above a target) increase, the unreliability in outcomes that is tolerated becomes greater and greater . . . (W)henever cumulated resources are below the focal reference point . . . variability is set so that the risk taken increases monotonically with (negative) distance from the focal point. (March and Shapira, 1992, p. 173)

They also emphasise the importance of the 'survival point' (where cumulated resources are close to zero) in risk-taking. Decision makers exhibit 'decreasing risk taking as survival is increasingly threatened . . . Most risk takers spend most of their histories barely surviving and taking very little risk' (pp. 175 & 176)

These studies have implications in the context of the capital market and portfolio theory. First, if, as the American Accounting Association (1972, p. 417) argued, 'the assessment of relative risk in turn implies a setting of the price for the security, such that the expected return is commensurate with the risk' and if (Dyckman *et al.* 1975, p. 8), 'investors will be concerned with their expectations for their portfolios, and all individual securities will be evaluated with respect to their relationship to these portfolios', target (or aspiration level) would appear to exist for a portfolio, the risk and return of additional securities added to the portfolio being measured against this aspiration level in a manner similar to March and Shapira's findings regarding target returns and Venture Theory's anchoring-and-adjustment. Second, institutional investors belong, by very definition, to institutions. The constraints and characteristics of the institution, March and Shapira (1987) argue, are an important influence on investors' behaviour in the face of information disclosed in an accounting setting.

3.4 CONCLUSION

Chapter 2 introduced the debate concerning the importance of uncertainty in human, and therefore, accounting experience. This chapter explored the development of the literature concerning human reactions to uncertainty and the reporting of it and the contribution of models of decision-making to theories of decision-making under uncertainty. That exploration noted (through, for example, Schoemaker (1990), Lipshitz (1993) and March and Shapira (1987 and 1992)) that the gap of uncertainty introduced in Figure 2.1 exists in what Newell and Simon (1972) term the 'problem-space'. This space creates its own specific needs, uncertainties and subjectivities. One of these spaces is the problem space of accounting. The following chapter, chapter 4, outlines research specific to the problem space of accounting.

The thesis draws on this research and various aspects of the exploration in this chapter to develop the foundations of hypotheses which will be constructed in chapter 6 and tested in chapters 8 to 10. In particular, the impact of ambiguous disclosure of uncertainty on decision-making and confidence (or 'subcertainty') will be explored. The representativeness heuristic outlined in section 3.2.3 prompts the hypotheses concerning the influence on perception of the characteristics of the reporting entity in section 6.2.3. Kahneman and Tversky's Prospect Theory (in Figure 3.5) argues that decision-makers reactions to gains and losses are asymmetric: that decision-makers are generally risk averse in the domain of gains and risk seeking in the domain of losses. As the research results would potentially be confounded by such asymmetrical reactions, the disclosures of uncertainty comprising this research will relate to losses only.

The suggestion of Litterer's model (Figure 3.4) that decision-makers choose from a broad information set based on, for example, past experience will inform the extent of disclosure in the research instrument developed in chapter 7. Further, in this context, the need for 'closure' portrayed in Litterer's model (Figure 3.4) will be used in section 6.3 to contribute to a view of the development of an 'intersubjective' view of the world.

CHAPTER 4

UNCERTAINTY AND THE INVESTMENT / ACCOUNTING CONTEXT

4.1 INTRODUCTION

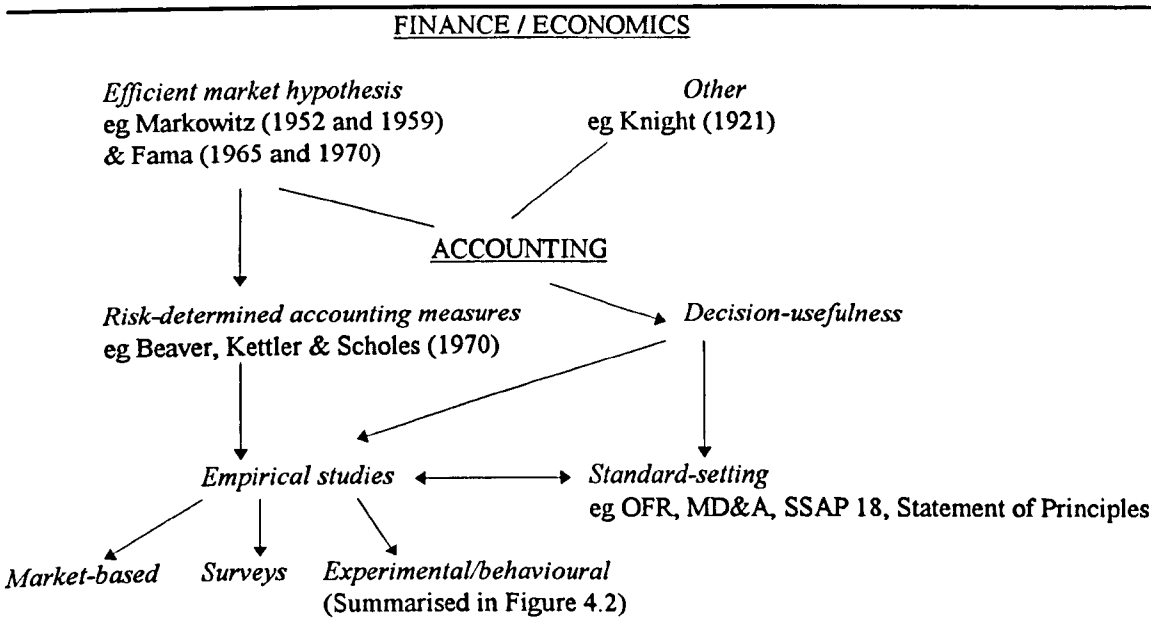
Douglas, in *Risk Acceptability According to the Social Sciences* (1984, p. 28), suggests that 'when an established discipline applies itself to a new field, something inevitably happens to its methods: Sometimes a new rule-of-thumb [or heuristic] is transferred, sometimes only a metaphor.' In the application of decision science (or 'human information processing') to accounting, these metaphors have been classified by Ashton (1982) as 'Lens Studies in Accounting' and 'SEU [Subjective Expected Utility] Studies in Accounting'. Both of these areas have been introduced in chapter 3.

Lens Studies, conforming to refinements of Brunswik's model, have mainly been used in the area of auditing (internal control, materiality judgments and audit report perceptions), management accounting (budgeting and control) and, pertinently in this context, in the study of the assessment and prediction of share prices using (among other information) accounting information. SEU studies, comprising a wider, more diverse field of decision science provides a richer framework for the study of reaction to accounting information in its various settings.

Chapter 3 identified the broad framework within which such decision theories developed. As part of such a development, the importance of the context of decision-making was emphasised. This

chapter discusses previous research of decision-making under uncertainty in the accounting context. The main strands of the developments in the area are summarised in Figure 4.1.

Figure 4.1: Summary of key strands of research concerning uncertainty and financial reporting



As noted in chapter 2, the importance of uncertainty in investment and other decision-making arose initially in theories of economics. Such views found their way into the accounting discipline by way of the consideration of accounting measures which might inform users of risk and uncertainty by, for example, Beaver *et al.* (1970). These studies in themselves spawned market-based and other studies of the value of different elements of financial statements. In particular, such research examined the ability of financial statement numbers to encapsulate a view of the risk facing a reporting entity. These empirical studies will be explored in Sections 4.2 and 4.3) of this chapter.

Of interest in the context of this thesis are two categories of studies:

(1) Studies involving the determination of the value of, and users' use of, information concerning risk and uncertainty currently disclosed in financial statements and annual reports (whether implicit or explicit). These studies involve capital-market based research (Section 4.2.1),

surveys of users' perceptions and opinions (Section 4.2.2) as well as experimental, laboratory studies of models of decision-making (Section 4.2.3).

(2) Studies exploring the value and use of new information regarding risk and uncertainty which may potentially be disclosed in financial statements and annual reports. Included in this category are surveys of users (Section 4.3.1) and experimental, laboratory studies (Section 4.3.2). As chapter 5 will suggest an experimental approach to the research, these experimental studies will be discussed in some detail.

The next section, Section 4.2, explores studies of the value of currently disclosed information. Section 4.3 examines studies concerning the value of new information and additional disclosures. The chapter concludes in Section 4.4 by identifying briefly the contribution of these studies to the development of the research approach and by summarising the main attributes of the research approach in chapter 5 which will distinguish the research from previous studies.

Chapter 5 will then draw on specific proposals within the standard-setting process to develop an evolutionary, policy-driven framework within which the research will proceed.

4.2 CURRENTLY-DISCLOSED INFORMATION AND THE ASSESSMENT OF RISK

4.2.1 Market-based research

Market-based studies of the relevance of currently disclosed information measure the correlation of risk indicators in financial statements and beta (e.g. Beaver *et al.* (1970), Farrelly, Ferris and Reichenstein (1985) and Ferris, Hiramatsu and Kimoto (1990)). Early discussion of risk (e.g. Beaver *et al.*) concentrated on market-wide CAPM-based *beta* as a measure of risk. Such an approach has been questioned by Blume and Friend (1973) and Farrelly (1981) on the grounds 'that the *beta* coefficient measures only part of what investors mean by risk' (Blume and Friend, 1973, p. 32). Later studies, therefore, attempted to measure the correlation between information in financial statements indicated by users as indicative of risk and the *beta* coefficient. They have

also used measures of risk other than *beta*, which Farrelly *et al.* (1985) consider an objective, but *ex-post* measure of risk. These studies have been summarised and extended by Mear and Firth (1988) and Capstaff (1991)

Mear and Firth conclude (p. 340) that 'accounting reports do convey, at least in an implicit fashion, information relevant for the assessment of ex ante risk' while Capstaff (p. 197) finds that 'accounting information was . . . relevant to analysts' risk perceptions in the UK which is consistent with the findings in the USA and Japan.' Capstaff also found differing correlations between market *beta* and accounting measures of risk. In the UK, for example, none of the variance in market beta was explained by accounting measures while in the US the relationship was significant (Farrelly *et al.*). Such findings justify the departure from the practice of depending on *beta* alone as a measure of risk. They also led to the use of both survey/questionnaire and market-based research itself in determining existing indicators of risk in financial statements.

4.2.2 Survey-based research

An important caveat to the survey-based approach in this context is one of the findings of studies by MacCrimmon and Wehrung (1986) and March and Shapira (1987): that the perception of managers of their own risk propensities was not entirely accurate. In survey-based research, subjects (normally, but not exclusively, user groups) are asked to examine lists of information which are (or could be) disclosed and to rank them in importance. Courtis (1992) summarises such surveys and discusses their reliability. The use of currently-disclosed information by private investors is comprehensively surveyed by Lee and Tweedie (1977 and 1981) and Arnold and Moizer (1986). More narrowly defined studies have been carried out by Benjamin and Stanga (1977), Firth (1978) and McCaslin and Stanga (1986). These studies compared and contrasted the different information and measurement needs of users, the latter two agreeing that the information needs of bankers and analysts, as revealed by their survey responses, were largely similar.

Chandra (1974, p.21) found that perception of information currently disclosed differed between accountants and analysts. Some of the explanations for this finding offered by Chandra are worthy

of note in the context of the discussion of risk and uncertainty. Chandra (p. 741) suggests that investors operate in a different time frame than accountants:

> The user group deals in a dynamic security market. Tools and techniques of investment analysis change to meet the new challenges of the market. Users are under constant pressure to improve their techniques. The preparer group is not subject to the same kind of pressure . . . [Another] factor contributing to the lack of consensus may be a tendency by accountants to adhere to the established order rather than experiment with new ideas and approaches . . . What is needed to amend such a situation is more research on user models and recognition by the profession of the importance of the user and his information needs.

4.2.3 Experimental / laboratory studies of models of decision-making

Snowball (1986, p. 50) provides a discussion and analysis of 'accounting laboratory experiments on human judgment': 'The 120 studies involving accounting laboratory experiments on human judgments represent 6.9% of the total article published during 1964-1984. More than two-thirds of the studies were published in the period 1976-1984.' Snowball classifies the studies as concentrating on judgments by managers, by auditors and by external report users. This discussion will be oriented towards the latter. A wide range of studies examined for the most part the use of existing, currently available information, both financial and non-financial. (e.g. Slovic, Fleissner and Bauman, 1972; McGhee, Shields and Birnberg, 1978; Libby, 1979; Abdel-Khalik and El-Sheshai, 1980 and Lewis, Pattern and Green (1988)). Other studies of a generally descriptive nature (e.g. 'How do Financial Analysts Make Decisions?' (Bouwman, Frishkoff and Frishkoff, 1987)) have been carried out by Gooding (1972) and Gniewosz (1990).

Libby (1979a) examined the effect on bankers' decision-making of the disclosure of uncertainty and / or a subject-to audit qualification. This study was replicated in a Canadian setting by Abdel-Khalik, Graul and Newton (1986, p. 341): 'The findings of both studies consistently indicate that disclosure of uncertainties due to contingencies is considered relevant information by bankers.

However, the addition of a qualified opinion in the audit report . . . has no significant impact on bankers' decisions, given the disclosure of the uncertainties alone.' Libby (1979b, p. 51) found that 'disclosure of a major uncertainty due to litigation combined with supplemental non-accounting information concerning the uncertainty had a major impact on bankers' risk assessments.' The study also suggested that a simple heuristic was being used in evaluating information regarding uncertainty:

> The most likely outcome of the uncertainty was estimated and treated as certain in the estimation of future cash flows . . . This strategy, which involves the substitution of the bast guess in place of a probability distribution, is similar to the approach taken in simple capital budgeting models and is consistent with the results from studies of decisions based on probabilistic data. (Libby, 1979b, p. 51)

A significant contribution with regard to the manner in which subjects make investment decision has been made by Slovic (1972) who confirms, as noted in chapter 3, (p. 794) that

> recent evidence suggests that the subjects in [the experiments carried out by psychologists] were choosing according to decision rules such as 'minimize possible loss' or 'maximize possible gain', rather than basing their preferences on variances per se . . .

Slovic's observation, drawn from decision theory generally, is also commented on earlier in the context of the perception of shares by Green and Maheshwari (1969). Their study attempted to discover whether decision-makers' perceptions of ordinary shares 'were related to hypothesised attributes of mean and variance of return' (p. 439). They found that 'perceived risk and perceived growth are quite pervasive in subjects' perceptions of the similarities and differences among stocks.' (p. 445) Interestingly, their findings regarding the influence of the decision-makers utility function on portfolio selection were inconclusive. In a similar study, Gooding (1973 and 1975) found that 'investors' average stock perceptions are highly related to risk and return measures' (1975, p. 1314).

Ronen (1971), Hirsch (1978) and Snowball and Brown (1979) also tested whether decision-makers in a variety of contexts complied with the risk-return criteria of SEU and capital market

theory and found decision-behaviour to be less consistent and more complex than SEU hypothesised. Greer (1974, p. 502), after studying classical utility theory in the context of corporate decision makers and simulated (non-equity) investment opportunities, concluded that 'there appears to be substantial conflict between the decision processes used by actual decision makers and existing utility theory.' In the context of the use of accounting information, therefore, Slovic's comments appear to hold true.

Ironically, then, having hatched the idea that knowledge of risk, as measured by variability of returns, is important to investors at a general, aggregate level, it appears that at the level of the decision maker, risk may not be perceived solely as the variability of returns. When climbing a mountain (as portrayed Newell and Simon in chapter 3), for example, we not only want to reach the top, we are also afraid falling (as argued by March and Shapira and Loomes and Sugden's Regret Theory in chapter 3). May and Sundem's 'black box' displays different and more complex characteristics than simply an aggregation to a share price. The extensions and refinements of classical decision theory proposed by Kahneman and Tversky, Einhorn and Hogarth and others appear, therefore, to offer promise when considering expanding the information set to include new explicit information concerning risk.

4.3 THE POTENTIAL FOR NEW INFORMATION AND THE ASSESSMENT OF RISK

The studies discussed this far were concerned with the use of existing information. Several studies have also looked at the potential value and relevance of other information in financial decision-making. Two strands of research are particularly pertinent: that which looks at the use of budgeted/forecast information in general and that which concerns itself with disclosures in the form of confidence intervals and / or probabilities.

4.3.1 Survey-based research

Chenhall and Juchau (1977) extend survey-based research of existing accounting information by considering (p. 111) 'information that is or may be generated from both within and outside the

corporate reporting framework.' Based on a survey of investors, their findings are interesting in this context in that the investors surveyed ranked as highly important such uncertain factors as the future economic outlook of the company and the industry of which the firm is a part. Information concerning the specific risk of losing money on shares held in the company was ranked as moderately important, 9th in 37 items mentioned in the survey. Budget statements of performance and position were ranked 13th.

Courtis (1992) summarised survey-based studies of financial disclosure and measured the robustness of their economic interpretations. In doing so, he found (p. 42) that 'information items with an expectation orientation are, as a group, perceived to be more important than items with an historic (*sic.*) or current period orientation.' Within that group of 'expectational information', contingent liabilities, the future economic outlook of the economy and expected future sales growth were ranked highly. A survey of financial analysts by Buzby (1977) led him to conclude (p. 433) 'that an opportunity exists for an expansion of the extent of disclosure in the annual reports of small and medium size companies [which formed the basis for his study]'

On the other hand, Farrelly (1981) surveyed financial executives to ascertain their views concerning the disclosure of capital investment plans and found that only 30% agreed that such plans should be disclosed, the main concern being the lack of reliability (or ambiguity?) of such disclosures. The reliability of forecasts also concerned Birnberg and Dopuch (1963) and Ijiri (1968). Also of concern (Birnberg, 1976) was the lack of behavioural evidence that users would benefit from additional disclosures. Studies offering such behavioural evidence are considered next.

4.3.2 Users and additional disclosures

Studies of additional disclosures have focussed mainly on the investment and lending decision. This focus has not been exclusive as several studies, including experimental studies, have examined the effects of disclosure on other users, particularly employees. (For example, Mautz (1990) explored the influence of inflation-adjusted disclosures in a collective bargaining context.)

A study by Danos, Holt and Imhoff (1989, p. 245) 'confirmed the overall importance of historical and forward-looking accounting information in the lending decision process.' Gonedes and Dopuch (1976), referring to the SEC's interest in forecast disclosures, concluded (p. 133) that:

> the debate over required forecast disclosure is of interest if forecasts convey information pertinent to establishing the firms' equilibrium values. Our empirical results on income forecasts are inconsistent with the statement that those forecasts convey no such information.

McDonald (1973), in an inconclusive study, reviewed the reliability of published forecasts, commenting initially (p. 502) that 'disclosure of earnings predictions has not been attacked on the basis of relevancy.' This remark stems from considerable comment at the time regarding the disclosure of budgets which Cooper, Dopuch and Keller (1968, p. 641) contended would 'encompass proposals for alternative measurements without requiring an abandonment or even alteration in presently used bases of financial reporting', knitting together the revolutionary and evolutionary proposals by ASOBAT regarding alternative measures and additional disclosures explored in section 2.4.

Several experimental studies have looked specifically at ASOBAT's suggestions regarding the disclosure of uncertainty. The objectives and methods of such research is summarised in Figure 4.2.

As noted in chapter 2, the accounting literature in the late '60s, early '70s had supported the reporting of unceertainty through some form of probabilistic statements in accounting. Chapter 2 further commented that elements of thse proposals have re-emerged in FRS 6 (ASB, 1994b) and the draft *Statement of Principles* (ASB, 1995b). Oliver (1972, p. 155) set out to obtain information in an experimental setting on the 'effects of a change from conventional financial statements to a form of probabilistic financial statements'.

Figure 4.2: Summary of research concerning the disclosure of measures of uncertainty in financial statements.

Author(s)	Subjects	Group design	Information presented	Task(s)	Hypotheses (H_0)	Result(s)
Oliver (1972)	123 professional bankers	* 2-group pre-test only control group design * Randomly assigned	* B'kground info. on the economy and industry * 2 years of financial statements * One group given symmetrical interval statements (audited, 90% confidence)	* Best and worse allocation of loan funding ($200,000 available, $225,000 requested)	* Loan decisions equal between groups * Best and worse decision equal between groups	* H_0 not rejected
Bimberg and Slevin (1976)	100 MBA students	* 2x2 groups of 25 * Randomly assigned	* Non-accounting context * 2 sets of 5 prior non-symmetrical findings * 2 different disclosures: one group given a 95% confidence interval, the other group given no confidence interval	'A target level [or goal] for a decision'	* Confidence intervals do not add to intuition regarding the relative size of the interval around the point estimate	* H_0 supported. * It appeared that subjects overreacted to increased variability
Keys (1978)	57 commercial bank loan officers	* Solomon Four-Group Design	Two sets of three year financial statements, one set with confidence intervals, the other conventional	* 6-month loan decision and 4-year loan decision: - loan/no loan - interest rate - amount loaned	* Various	* Concluded that confidence interval financial statements did not affect loan decision
Chen and Summers (1981)	82 MBA students	* 4 groups repeated measure * Assigned on the basis of attittude to accounting information, risk attitude, cognitive complexity and presonality	1. Deterministic 2. 1 interval with no level of confidence 3. 1 interval with 90% confidence level 4. 3 intervals with 90%, 95% and 99% confidence levels	* Share price in an investment context * Cost in a management accounting context * Allocation of limited funds * Satisfaction/ confidence re. decision * Perceived difficulty of task * Attitude toward data	* See discussion, pp. 105-106	*See discussion, pp. 105-106.

The 123 participants in Oliver's study were professional bankers. They were assigned at random to two groups, a control group and an experimental group. Each group was given (p. 159)

(1) 'fabricated background information on the national economy, an industry, and hypothetical companies from that industry, and

(2) two years of comparative financial statements for each company.'

The experimental group was given financial statements and common size statements with some elements stated as intervals (e.g. in the income statement cost of goods sold and operating expenses were stated as intervals) along with an audit report stating that the level of confidence in the estimates was 90%. The control group was given financial statements and common size statements containing the mean of each interval. Subjects were given a maximum of $200,000 to loan to the two companies (they could decide not to loan all this amount). One company had requested $70,000 to $105,000, the other $80,000 to $120,000. The subjects were asked to state what the best and worst loan allocation would be.

Oliver hypothesised that the best and worse decisions would be equal between the two groups. Using chi-square and Kolmogorov-Smirnov tests at a 0.05 confidence level, he concluded that the hypotheses outlined could not be rejected.

Birnberg and Slevin's (1976) study extended Oliver's study, pointing out (p. 153) that Oliver's intervals 'apparently were symmetrical' and arguing that a 'stronger manipulation" of the variables was required. The subjects were 100 MBA students. The context was not an accounting context. The subjects were divided into 4 groups of 25. 'Each subject was given a problem which required him / her to set a target level for his / her decision and to establish a formal decision rule.' The information given to the subjects differed in two ways:

(1) variability (the scores of 5 MBA students at another school) which was high (standard deviation of 24) and low (standard deviation of 8) and

(2) disclosure (one group was given a best estimate of the outcome with a 95% confidence interval while the other group was given no information).

In that way a 2x2 experimental design was established.

Birnberg and Slevin concluded that the disclosure of the explicit confidence interval had little effect on the subjects' estimates. It appeared however that subjects overreacted when the variability of the prior scores increased. They commented (p. 156) that 'apparently the skilled user of financial statements already possesses a notion of the relative size of the interval around the point estimate from past experience.' This led them to comment that situations when the user had little experience of the context could be worth investigating. A study of the nature of learning in the light of confidence intervals and changes in the underlying process would also be useful.

Keys' (1978) study also extended Oliver's study. Specifically Keys made changes to Oliver's research design to ascertain whether Oliver's findings could be attributed to the specific characteristics of the experimental design (e.g. confidence intervals, the terms of the loan decision). The experimental design was pilot tested. Subjects were presented with the financial statements of unidentified actual companies in the same sector whose net assets ranged between $1 million and $10 million. Three years of audited financial statements were presented. The subjects were 57 commercial bank loan officers working in small to medium sized banks in Illinois. They were divided into 4 groups. The Solomon Four-Group Design was used. Two groups were pretested, one receiving confidence interval financial statements, the other receiving conventional statements. All four groups were posttested, two receiving confidence interval financial statements, two receiving conventional financial statements.

Subjects were asked to decide on a loan application for $150,000 secured on machinery of the company, including the term of the loan and the interest rate to be charged. Two loans had been requested, one for six months and the other for four years. Both were to finance increases in inventory. Keys analysed the variance and covariance of results and concluded that the confidence interval financial statements did not affect commercial bank loan decisions.

Libby (1979b) set out to assess the impact of uncertainty reporting on the loan decision. A previous study by the same author (Libby, 1979a) had found that uncertainty qualifications in the audit report indicate

(1) an increase in loan risk and

(2) a demand for more information regarding the uncertainty.

The later study (which is more pertinent to this research as it relates to uncertainty reporting in the financial statements rather than in the audit report) was concerned with the effect of the disclosure of a material uncertainty with supplemental information regarding that uncertainty. 20 loan applications were devised combining 3 different pieces of information:

(1) financial statements: two years of financial statements were presented with five year financial summaries. 25% of these would qualify for a loan at the maximum rate charged by the bank while the other 75% would qualify at the minimum rate but would be affected by uncertainty. (This corresponded with findings regarding firms generally.)

(2) management evaluations including organisation of the firm, background of executives and accounting and marketing capabilities. Half of these were favourable and half were unfavourable.

(3) three different uncertainty disclosures: no disclosure with an unqualified audit opinion, uncertainty regarding litigation with an unqualified audit opinion and uncertainty regarding litigation with a qualified audit opinion. Where the uncertainty was disclosed it was accompanied by supplemental information concerning the likely outcome of the litigation. Half of these were positive and half were negative. This supplemental information was regarded by Libby as a competing source of information and its presence was seen by him as a strength of the study. He commented (1979b, p. 37) that 'statistical decision theory indicates that increased variance in the population increases the value of additional sample information.'

Participants were 34 experienced loan officers from 4 financial institutions. They were randomly assigned to two different groups. Each group was mailed 12 loan applications. One group received the 4 cases where no uncertainty was disclosed and the 8 cases where uncertainty was disclosed by way of footnote and supplemental information only. The other group received the same 4 no disclosure cases and the 8 cases where disclosure was by way of footnote, audit report and supplemental information. Background information was provided comprising in each case the company history, industry conditions and projections and the loan proposal. This background information was common to each of the 12 cases that participants received.

The participants were asked two questions:

(1) would they grant the loan and

(2) if they would grant the loan, the interest rate premium that they would charge or, if they would not grant the loan, the interest rate premium which they believed would be charged by another source.

Libby (p. 56) found that 'the disclosure of a major uncertainty due to litigation combined with supplemental nonaccounting information concerning the uncertainty had a major impact on bankers' risk assessments'. The addition of the qualified audit report did not appear to have a similar effect on the loan decision. He also commented that participants possibly tended to calculate the most likely outcome of the uncertainty and treat that as certain in calculating future cash flows.

A study by Abdel-Khalik *et. al.* (1986) replicated and extended that of Libby (1979b). The variables used in this study were three forms of audit report (unqualified, subject-to and 'two-sided', the latter being a clean opinion for Canadian shareholders and a subject-to opinion for US shareholders) and two common types of loss (tax assessment and litigation). The participants were 64 Canadian commercial loan officers from seven large banks. The participants were each given the financial statements of three hypothetical companies (developed from Canadian corporations and controlled for size, capitalisation ratios and past profit trends). A three-year simulation was presented with audit reports varying over the three years. Subjects were divided into two groups, the difference between the two groups being the year of introduction of the 'two-sided' audit report (year 2 in the case of one group and year 3 in the case of the other). Similarity between the two groups was confirmed using initial-year judgments based on the same information. The findings of this study (p. 381) were similar to those of Libby: 'the disclosure of uncertainties due to contingencies is considered relevant information by bankers. However the addition of a qualified audit opinion in the audit report . . . has no significant impact on bankers' decisions given the disclosure of the uncertainties alone.'

Chen and Summers (1981) reported on the findings in a Ph.D. dissertation by Chen in the University of Texas at Austin in 1974 (Chen, 1974). The subjects were 82 MBA students. Subjects were divided into 4 groups based on attitude toward accounting data (i.e. perception of its credibility), risk-taking tendency, cognitive complexity and personality. Each group was given four types of information in 2 different contexts. The types of information given were as follows:

(1) deterministic information,

(2) one interval with no level of confidence,

(3) one interval with 85% level of confidence, and

(4) three intervals with 90%, 95% and 99% levels of confidence.

The information was given in a random order. The decision contexts were, first, share price determination in an investment context based on single period financial statements with more than 30 values and, second, cost determination in a management accounting context based on 3 values. The range of past price (or cost) behaviour was also given. Subjects were asked to estimate the price (cost), the range of possible price (or cost) variations and the amount of capital which would be allocated to the investment (or project). Post-decision feelings toward the decision (i.e. confidence and satisfaction), perception of the task (e.g. difficulty) and attitude toward the data provided (e.g. worth of data, demand for additional data) were also elicited.

The investigation found no significant difference between estimates of price (or cost) based on the type of information given. Significant differences were found in the post-decision feelings towards the decisions made (significant at 0.01 level) and in perceptions toward the decision task (significant 0.001 level). Subjects generally felt more confident with their decisions when probabilistic information was provided. Accounting data was also used to a greater extent when in probabilistic form. However, disclosure of confidence levels with ranges of possible values was preferred to ranges of values alone.

Much of the research represents variations on the theme of the disclosure of probability measures, by Oliver (1972), Birnberg and Slevin (1976), Keys (1978) and Chen and Summers (1981). They arrived at various conclusions depending on the structure of the information provided and nature of the participants.

Birnberg and Slevin, for example, concluded (p. 153) that 'the presence of a formal confidence interval statement did not yield significant differences in the subject's decision' as 'apparently the skilled user of financial statements already possesses a notion of the relative size of the confidence interval around the point estimate from past experience' (p. 156). Chen and Summers (1981, p. 13) found, however, that 'removing the appearance of certainty from accounting affects decision making behaviour.' They also comment that 'a mere indication of the uncertain nature of the

reported figure does not necessarily provide subjects with more information that the conventional single-valued accounting figure.'

Thus it appears that not only do investors act on the basis of expected value and standard deviation as Sharpe (1964, p. 427) points out, they also have an idea of the deviation implied in the expected return. Crucially, however, several of the theories discussed in chapter 3 question not only the action implied by this hypothesis but also that the perception and motivation of individual decision makers is more complex than that suggested. Birnberg and Slevin do, however, indicate instances when the use of confidence intervals in financial statements may be useful: when the user has little if any past experience of the item in question and secondly, when the underlying process changes. The latter is considered quite prevalent by Foster (1986, p. 213) particularly when attempting to reproduce a process (specifically a time series) having 'estimation efficiency.' The former enters into the realm of research carried out on 'functional fixation'.

Birnberg (1976) responded to the specific suggestion that accounting numbers be communicated as ranges rather than single numbers. He pointed out that such disclosure may lead to 'information overload': 'proposals to expend the information supplied to consumers [of accounting information] should be viewed critically' (p. 220). He also argued (p. 219) that

> individuals exhibit a persistence of set ('fixity') from one period to another. This means that the income statement is viewed as, essentially, the same document summarising the same categories of events from one period to another. Should a major change occur in those events that are included in the income statement . . . there will be a time lag before the consumer of the financial data will recognize that the profit figure may have been calculated in a different fashion.

Such fixity (termed 'functional fixation') bridges the consideration of existing information and new information. It argues that when changes in disclosure do occur, that users cannot adapt to such change in the short-term. Among the studies of functional fixation are those carried out by Schroder, Driver and Streufert (1967), Revsine (1970), Ashton (1976), Chang and Birnberg (1977), Abdel-Khalik and Keller (1979) and Swieringa *et al.* (1979). Mautz (1990) studied the

effects of inflation-adjusted disclosures on perceptions of ability to pay found that such disclosures have little effect and speculates (p. 289) that this may be due to the lack of familiarity of the experimental subjects with the additional disclosures. The implications of familiarity (and lack of familiarity) will be further explored in chapter 11 in the context of the differences between the reactions of users of financial statements and others to the disclosure of uncertainty.

Particularly useful in the context of uncertainty and financial reporting is the distinction by Miller (1972) between the 'conceptual structures' of decision-makers. An important issue, therefore, in the consideration of the use of information is differences in the use of information by individuals and / or groups. Danos *et. al.* (1986) compared the use of published management forecasts by bond raters (expert judges) and by nonexperienced judges. A similar study was carried out by Anderson (1988) whose findings suggested that professionals (analysts) and non-professionals used data differently. Chapters 5 and 11 indicate how such differences might be overcome (chapter 5) and exploited (chapter 11) in the context of this research.

Gooding (1973) attempted to capture, descriptively, the investment decision-making behaviour of groups of investors. As well the finding described earlier, he also found (1973, p. 254) that three groups of investors (portfolio managers, investment professors, and nonprofessional investors) did not seem to use different information when evaluating ordinary shares. A further hypothesis, however, found that 'although all three investor groups may have used risk and return dimensions to judge the dissimilarities of the nine stocks, the perceptual differences between portfolio managers and nonprofessionals were more pronounced and probably more important. The finding that individuals have more heterogeneous perceptions than do portfolio managers, implies that price changes could become more pronounced in markets dominated by professionals' (1975, p. 1314) (as they would tend to have a more homogeneous view of the world).

Such a finding finds an interesting corollary in de Finetti's representation theorem described in Gardenfors and Sahlin (1988, p. 4). The thrust of this theorem is that 'even if two decision makers start out with widely different initial distributions . . . they will end up arbitrarily close to each other, if given sufficient time to experiment with the coin. Even though de Finetti does not believe that there are such things as 'objective' probabilities, one could sat that his representation theorem shows that everyone's subjective probability distributions would converge towards an

intersubjective probability distribution if given more and more information about what the world is actually like.' Similarly, Danos *et al.* (1989, p. 245) found that 'lenders continue to register significant increases in confidence as additional data are received' although they reach a very high level of confidence based on 'highly summarised financial accounting information and other general background data' and 'seldom does subsequent information cause them to alter their initial . . . judgment'. Hines (1991, p. 319) argues that the development of a conceptual framework 'is a process of reasoning, maintaining the assumption of an objective, intersubjective world as central.' The disclosure of additional information concerning uncertainty may, paradoxically, reduce ambiguity and uncertainty and lead to a more shared perception of the world.

4.4 CONCLUSION

That notion of 'intersubjective reality' renders this research different from other research carried out in the area. Further, the research which will be described in Section 5.2 differs from previous research in the area of financial reporting and uncertainty in a number of other respects.

This chapter outlined previous research in the area of uncertainty in the accounting and investment context. In particular, it focussed on research which examined the diclosure of new information regarding uncertainty. It identified the main approaches, findings and problems that charateristised such research. In doing so, it assists in distinguishing the unique characterstics of this research and also possible approaches to examining the research problem.

This research will be policy-driven. As such, it is based on proposals currently in accounting standards or other documents regarding the disclosure of uncertainty. As is evident in Sections 4.2 and 4.3 (and as will be argued in Chapter 5), experimental research can make a particular contribution to the exploration of new, additional forms of disclosure. Such disclosures will be identified in chapter 5, drawing on proposals discussed in Chapter 2, theories of decision-making examined in chapter 3 and previous research in the area explored in this chapter. They will incorporate the disclosure of the uncertain nature of financial statements and that they are based on estimates by management. These disclosures have not been tested in this form elsewhere. It also includes a disclosure of uncertain assets and liabilities where there is a careful distinction drawn

between the uncertainty of occurrence and outcome. The disclosure within each of these distinct categories will then be expanded so that differences between the disclosure of outcome and occurrence can be explored.

Research by authors such as Oliver (1972) and Chen and Summers (1981), for example, revolved around uncertainty of outcome with fixed intervals (if at all) regarding occurrence. The disclosures that will be proposed in chapter 5 are focussed on specific material instances of uncertainty (as suggested by FRS 6) of assets and liabilities. This allows the research to explore differences between disclosures of uncertain assets and liabilities in the context of the ASB's perception of the nature of assets and liabilities and the evidence necessary to recognise assets and liabilities. Finally (though of perhaps lesser importance) there is the context: the era of accounting thought within which the research takes place, the experience and background of the subjects involved and the fact that most if not all other research in this particular area took place in the US / Canadian context.

These characteristics of the research individually and together render this research different and, given its policy consciousness, worthwhile. Having established its context, the following chapter explores how this research is specifically focussed and implemented.

CHAPTER 5

THE RESEARCH APPROACH

5.1 INTRODUCTION

Chapters 2 and 3 identified the research question of this thesis as, in broad terms, the importance of the disclosure of uncertainty in financial reporting and its effect on perceptions in an accounting context. This chapter outlines the research approach adopted in exploring this question. The identification of the approach to the research question allows the establishment of the research hypotheses in chapter 6. These hypotheses will be developed within a behavioural, decision-making context, drawing on theories outlined in Chapter 3. Chapter 7, sets out the manner in which the research hypotheses will be tested.

This chapter is in three main sections. The first of these, Section 5.2, outlines briefly the search for a framework within which to develop the research hypotheses. Section 5.3 describes the specific research method adopted in the research. The approach suggested is experimental. Section 5.4 then outlines some of the general issues raised by such experiments and how these issues are dealt with. It also identifies some of the limitations arising from the approach and outlines research designs which minimise those limitations.

5.2 THE SPECIFICATION OF THE RESEARCH APPROACH

In his review of ASOBAT, Sterling wrote that 'the theory of accounting is subject to revolutionary change but the practice of accounting must be evolutionary' (Sterling, 1967, p. 99). This contention remained in the ASB's *Statement of Aims* one of which was 'to take account of the desire of the financial community for evolutionary rather than revolutionary change in the reporting process' (ASB, 1991c, para. 7). Section 2.4 outlined a number of proposals concerning the disclosure of uncertainty. This section examines such proposals with a view to establishing a specific basis within which the issue of the disclosure of uncertainty may be addressed. At all times, the research aims to be practical by testing in a feasible manner current developments and suggestions regarding the disclosure of uncertainty.

Chapter 2 outlined the rise of decision-usefulness in influencing policy-making and standard-setting in accounting. The decision-usefulness paradigm informed the adoption of substance over form and the emergence of the view that users needed information concerning risk and uncertainty. Such considerations fashioned accounting standards and pronouncements and injected into the agenda of policy-makers the need to disclose information regarding uncertainty in some form. The first section of this chapter draws on such current developments to narrow the consideration of uncertainty outlined in chapter 2 to a specific framework which is implemented in chapter 7 and discussed in chapters 8 to 11. Chapter 12, in concluding, discusses some of the limitations (including the inevitable narrowness) of the research.

5.2.1 The classification of uncertainty

Having explored broad and general issues in the research in chapters 2 to 4, the research must form an apparatus within which to test those issues. 'The urge to find pattern' found by Simon and Sumner (1968) (described in chapter 3) also aptly describes the search for a framework within which to test uncertainty in the accounting context. This search initially sets out to classify and characterise the manifestation of uncertainty in accounting. The influence of uncertainty

on financial accounting has been classified in many ways including, for example, by Boritz (1990), Pope and Marshall (1991) and by the AICPA (1994).

As noted in chapter 3, Pope and Marshall (1991, p. 59), in a review of the disclosure of the management of exchange rate and interest rate risk distinguish between

a) transaction exposure:
b) translation exposure, and
c) economic exposure.

Belk and Glaum (1990, p. 4) call translation exposure 'accounting exposure' and comment that 'accounting exposure does not give a true picture of the effects of exchange rate changes on the economic value of the firm, and the gains and losses measured are purely of a paper nature.' Such arguments, and those outlined in chapter 2, support the case for wider recognition in financial statements of the effect of exchange rate risk, for example, than simply the translation of balances.

The AICPA *Statement of Position: Disclosure of Certain Significant Risks and Uncertainties* (1994) suggests some such wider disclosures. The Statement (p. v)

> requires reporting entities to include in their financial statements disclosures about -
>
> - The nature of their operations.
> - Use of estimates in the preparation of financial statements.
>
> In addition . . . it requires entities to include in their financial statements disclosures about -
>
> - Certain significant estimates.
> - Current vulnerability due to certain concentrations.

The latter two disclosures are required only if the estimates in the financial statements may change in the near term due to one or more confirming events and the effect of the change would be material to the financial statements.

Boritz's (1990) classification is somewhat similar to that of the AICPA. Boritz (1990, p. 27) comments that 'several sources of risk are commonly referred to in the context of financial reporting. These risks are sometimes called 'business risks' to distinguish them from the 'information risks' that are faced by users of financial information in addition to those risks'. This classification is compelling as it mirrors Nurmi's characterisation (1983, p. 106) of ambiguity as arising from randomness in the environment (business risk) and ambiguity in the presentation of that randomness (information risk). It also echoes Urbany, Dickson and Wilkie's (1989, p. 208) findings that uncertainty may be classified on two dimensions: 'uncertainty regarding what is known about the alternatives (knowledge uncertainty) and uncertainty regarding which alternative to choose (choice uncertainty)'.

Boritz then goes on (p. 44) to identify 'classes of uncertainty that financial reporting can address' as:

1. Uncertainty about the Nature and Role of Financial Statements: 'such uncertainty may result, in part, from a misunderstanding of the nature, purpose and method of preparation of financial statements',

2. Uncertainty about the Nature of Business Operations Portrayed in the Financial Statements: 'uncertainties may flow from the unpredictability of business activities in the face of technological, financial and other competitive changes in the economy';

3. Uncertainty due to Limitations of Financial Statement Measurements and Disclosures: 'Uncertainties may arise from reliance on information which is incomplete, incomprehensible, irrelevant, unreliable or not comparable.'

Boritz elaborates that such uncertainties may result from:

a) limitations of methods used to measure current position and past results,

b) incompleteness of information disclosures,

c) limitations of methods to predict and/or estimate potential losses (because of past actions) whose resolution depends on future events - termed contingencies,

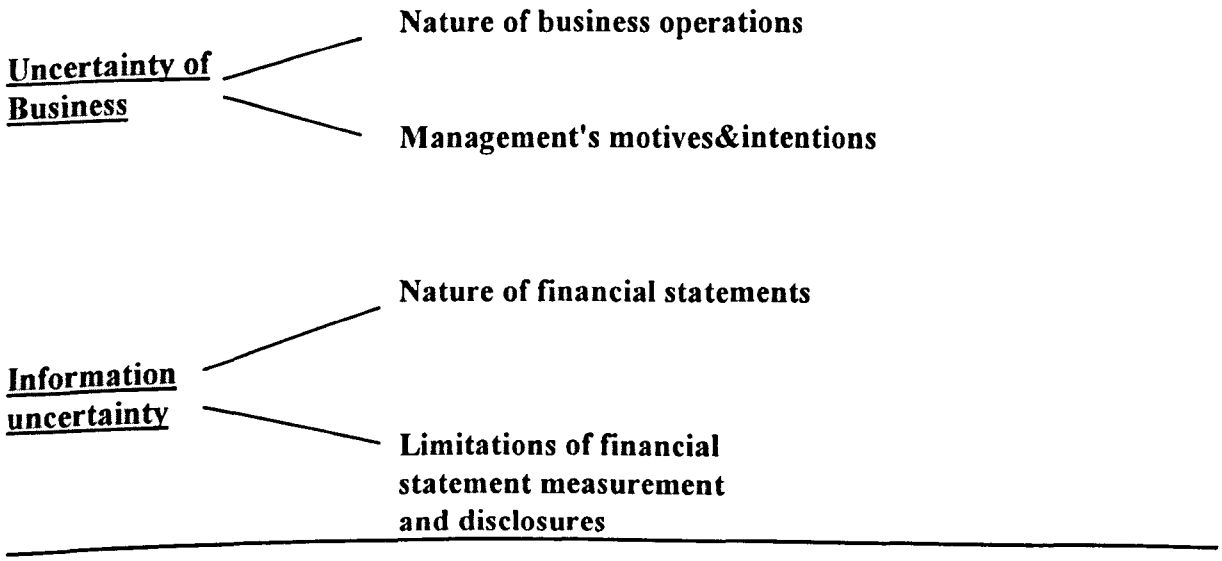
d) weaknesses in the understandability of information disclosures, and

e) limitations of the methods used to audit or review financial information.

4. Uncertainty about Management's Motives and Intentions: 'the uncertainty that some groups of users, as outsiders, experience about the impact of management motives and intentions on the information contained in the financial statements and other related information.'

Drawing on Boritz's broad dichotomy of risk as information risk and business risk and the classes of uncertainty in a financial reporting context, Figure 5.1 brings together the uncertainties faced by users of financial statements.

Figure 5.1: Classification of uncertainties (Boritz, 1990)



This classification differs is broader than that of Pope and Marshall. Pope and Marshall's (1990) classification of uncertainty is a subset of both information risk ('translation exposure') and business risk ('transaction exposure'). Their concentration on particular elements of the risk attaching to foreign exchange may be broadened into the general uncertainty of financial reporting.

5.2.2 Reflecting uncertainty in financial statements

As noted in section 2.4, there are many ways to reflect (i.e. recognise and / or disclose) such uncertainties in financial statements and / or annual reports. These include proposals by Vatter (1965), ASOBAT (1966), Brief and Owen (1968, 1969), the AAA *Committee on Concepts and Standards - External Financial Reporting* (1973), Milburn (1988), Boritz (1990) and the AICPA (1994).

Several of these suggestions, while interesting, involve significant change in the way events are recognised, valued and presented in financial statements. Brief and Owen, for example, suggest the use of estimation theory involving models of probability, while Milburn proposes the use of discounting in a comprehensive manner. *The Committee on Concepts and Standards - External Financial Reporting* (AAA, 1973, pp. 219-222) suggested the presentation of 'full-scale probabilistic statements'. Such statements 'are based on reducing a discrete probability distribution for each year to a single value, the mean, and then the present worth of the means are discounted to find a present value of the future cash flows.'

While information concerning uncertainty involves additional disclosures, these disclosures should be within the current parameters of financial reporting. This is critical from the point of view of understandability and acceptability. Furthermore, such an approach is mindful of Birnberg's (1976) warning (outlined in chapter 4) regarding the expansion of the information supplied to users of financial statements or the initiation of major change in the events presented in financial statements. It also reflects the objective of standard-setters that change in accounting should be evolutionary rather than revolutionary (ASB, 1991c).

In this research, concrete ways in which to reflect the uncertainties identified by Boritz ('business risk' and 'information risk') are developed by identifying suggestions within existing accounting standards and pronouncements. These include the OFR (ASB, 1993a), the accounting standards of the ASB, the Cadbury Report (Committee on the Financial Aspects of Corporate Governance, 1992), and the AICPA Statement of Position (1994).

5.2.2.1 Disclosure of 'business risk'

Chapter 2 explored in general terms the attempts by the OFR to establish 'a framework for the directors to discuss and analyse the business's performance and the factors underlying its results and financial position' (ASB, 1993a, para. 3). The AICPA *Statement of Position* (AcSEC, 1994) suggests the disclosure of the nature of the operations of the reporting entity. These disclosures are disclosures of business risk, disclosures relating to the risks arising from the nature of business operations and management's motives and intentions. Examples of such disclosures are the launch of a new product with uncertain prospects, research and development expenditure, the entry or exit of a competitor from the market or the death of a founding or key executive.

Developing sufficient disclosures that can be consistently applied in this context is problematic for various reasons. First, disclosure in such a broad context may take different forms. The most likely form of disclosure is by way of narrative where words may adopt a different meaning to each reader: the framing of the disclosure, rather than the disclosure itself, may create its own uncertainty, influencing perception and behaviour.

Second, the link between such disclosures and particular elements of financial statements, the future performance of the entity and the share price is also not clear. Third, the disclosure of a product launch or withdrawal for example may itself have uncertain effects. Good news and bad news may have different potential: for example, a product launch has an unlimited effect on turnover while the effect of a product withdrawal is limited to the current turnover of that

product. Finally, the OFR proposes (but does not require) that such uncertainties be disclosed within the annual report but not within the audited financial statements. Although the auditor may assess whether the information disclosed is not inconsistent with the financial statements, the disclosure is unaudited. This causes further 'noise' as the perception of the reliability of the information disclosed may depend on factors other than the disclosure. While none of these problems would lead one to avoid testing disclosure in this area, together they suggest that disclosure in the area is difficult to construct in a controlled way, that the link between such disclosure and perception is unclear and is potentially confounded by other variables.

5.2.2.2 Disclosure of 'information risk'

Financial statements are a way of presenting the transactions of a reporting entity and their consequences. As products of an uncertain world, they are themselves uncertain. As standard-setters attempt to represent more faithfully the complexities of the uncertain world, the risk that financial statements themselves may become more ambiguous ('information risk') increases. Such ambiguity affects financial statements, broadly, in two ways.

1. The financial statements themselves are uncertain (as explored in this section) and,
2. There is uncertainty regarding the recognition, measurement and disclosure of elements within the financial statements (section 5.2.2.3).

The research approach is to examine these particular uncertainties in detail.

Disclosure concerning the uncertain nature of financial statements has been suggested by the AICPA *Statement of Position* (1994). This disclosure is shown in Figure 2.6. It is similar to disclosure contained in the Directors' Responsibility Statement. It is not the objective of the Directors' Responsibility Statement to disclose the nature of financial statements but to clarify the responsibilities of the directors concerning published financial statements. In doing so, however, it does reveal that the financial statements are prepared based on 'suitable accounting policies, consistently applied and supported by reasonable and prudent judgements and estimates' (Committee on the Financial Aspects of Corporate Governance, 1992, Note 12). Where accounting policies are the manifestation of accounting choice, this disclosure is

the manifestation of the uncertainties resulting from accounting choice. This disclosure does not change the uncertainty surrounding financial statements: it merely reveals it.

It could be argued that sophisticated users of financial statements are aware that a 'true and fair view' does not imply certainty. However, 'to the man in the street . . . the words 'true and fair' are likely to signify that the accounts give a true statement of facts. He will be likely to associate facts with 'actual profit' and 'actual values' ' (Edey, 1971, p. 440). Nobes and Parker (1991) found differences in directors' understanding of 'true and fair' and of their responsibilities with regard to financial statements. Lee (1994) argued that some ambiguity existed concerning the nature of financial statements and the 'labels' attached to such statements. As part of the implementation of the research, the level of sophistication and experience of the users involved and the reaction to this disclosure from users with different levels of 'sophistication' will be assessed.

Furthermore, several suggestions have emanated from different bodies concerning the disclosure of the uncertain nature of financial statements. The MacDonald Commission in Canada (CICA, 1988, p. 11) asserted that 'it required little investigation to convince us that a homogeneous public with homogeneous expectations does not exist . . . Even within the financial community we can discern different segments whose views are likely to differ depending on their depth of knowledge about financial reporting and their particular experience with it.'

The AICPA in a Discussion Paper issued by its Task Force on Risks and Uncertainties (1987, p. 12) finds a

> need to communicate explicitly to users of financial reports that the inescapable use of estimates in the preparation of historical financial information results in the presentation of a considerable number of approximate rather than exact amounts. If users understand better the inherent limitations on precision in financial statements, they will be better able to make decisions.

It continues that such estimates are more difficult in times of economic volatility. Furthermore, the AICPA argues, that though many users of financial statements are aware of the uncertain nature of

financial statements, many others are not. In its subsequent *Statement of Position*, the AICPA (AcSEC, 1994, p. 41) commented that 'relatively few respondents expressed concerns regarding the disclosure of... the use of estimates in the preparation of financial statements'.

As well as suggesting the disclosure that financial statements are a product of estimates by management, both Boritz and the AICPA suggest that financial statements should provide sufficient disclosure of significant uncertainties to allow users to assess those uncertainties. This view was evident as early as 1966 in the AICPA's Committee on *A Statement of Basic Accounting Theory* (ASOBAT). The Committee wrote, in a section on the scope of future accounting (AAA, 1969, p. 65):

> Another aspect of multiple valuations involves the use of non - deterministic or quantum ranges with or without probabilistic measures. In view of uncertainties surrounding business activities and the measurement of their impact, the use of such non-deterministic measures is likely to become a part of an expanded accounting discipline of the future.

Such an argument, in its acceptance that the problems of accounting concern 'uncertainties of business and the measurement if their impact', recognises (as did Tweedie and Whittington (1990) discussed in chapter 2) the dual nature of uncertainty.

5.2.2.3 The dual nature of uncertainty

The essential elements of uncertainty, writes Rescher (1983), are the uncertain chance of the realisation or occurrence of an event and the outcome of that event if realised.

That uncertainty is of such a dual nature is reflected in the ASB's draft *Statement of Principles* (ASB, 1995b, p. 68) which states that 'recognition is triggered where a past event [occurrence] gives rise to a measurable change [outcome] in the assets or liabilities of the entity.' The ASB, in FRS 5 *Reporting the Substance of Transactions* (ASB, 1994a, p. 13),

outlines in greater detail the criteria necessary to allow recognition of an asset or liability in financial statements:

> Where a transaction results in an item that meets the definition of an asset or liability, that item should be recognised in the balance sheet if;
>
> (a) there is sufficient evidence of the existence of the item (including where appropriate, evidence that a future inflow or outflow will occur); and
>
> (b) the item can be measured at a monetary amount with sufficient reliability.

Again the dual requirement of evidence of occurrence and outcome is evident.

As noted in chapter 2, the ASB demands greater evidence for the existence of an asset than for the existence of a liability (ASB, 1995a, 1995b and 1997b). This asymmetrical approach is also found in SSAP 18 *Accounting for Contingencies.* Applying only 'to conditions existing at the balance sheet date, where the outcome will be confirmed only on the occurrence or nonoccurrence of one or more uncertain future events' (ASC, 1980, para. 1), the Standard requires recognition or disclosure based on uncertainty of occurrence as set out in Figure 2.4.

The recognition of gains and losses hinges on considerations of whether those gains and losses are remote, possible or probable. Uncertainty of outcome is addressed by the requirement that, in the case of gains and losses, the gain or loss must be estimable with 'reasonable accuracy' (ASC, 1980, para. 15). If the outcome is 'inestimable', uncertain gains and losses which are not remote (i.e. which are possible or probable) should be disclosed, but with no indication of the (inestimable) outcome.

That the occurrence of an event is 'probable' comprises part of the recognition criteria of the Australian Accounting Standards Board (AASB, 1992), the Accounting Standards Board in the UK (ASB, 1994a), the Canadian Institute Chartered Accountants Handbook (CICA), the International Accounting Standards Committee (IASC, 1994) and part of the definition of assets of the Financial Accounting Standards Board in the US (FASB, 1984 and 1985). FRS 5 (ASB, 1994a) uses the phrase 'most likely' in setting out how the substance of a transaction should be determined. Such definitions, in the words of Sterling (1985), connect a word (e.g.

remote, possible or probable) with the uncertain occurrence of an event and then recognise or disclose the outcome of that event in the financial statements. 'The available literature indicates that there is large variability in the mapping of phrases to numbers' (Budescu and Wallsten, 1985, p. 391). Budescu and Wallsten (1985), Chesley and Wier (1985), Chesley (1986) and Larsson and Chesley (1986) suggest that 'phrases are not as crisp as numbers': phrases are 'imprecise', 'vague', 'fuzzy' (Budescu and Wallsten, 1985, p. 403) and, as Nurmi (1983) might write, ambiguous.

Contingent losses which are probable are recognised in the financial statements. Other non-remote contingent losses are disclosed. Contingent gains are not recognised in the financial statements, are only disclosed when probable and only recognised when reasonably certain. Uncertain gains and losses (and hence assets and liabilities (ASC, 1980; ASB, 1997b)) are, therefore, for the most part, treated asymmetrically. Exceptions arise when the potential occurrence of the event is remote or reasonably certain. Remote gains and losses are neither recognised nor disclosed. Reasonably certain gains and losses are recognised. The ASB's Exposure Draft on the *Statement of Principles* (ASB, 1995b, p. 75) maintains this prudent tradition stating that 'prudence has the effect that less evidence of occurrence and reliability of measurement is required for the recognition of a loss than for a gain.'

One of the objectives of this research therefore is to assess differences between uncertain assets and liabilities. However, the research will focus on losses only due to the asymmetric attitude to gains and losses identified in chapter and represented specifically in Kahneman and Tversky's Value Function (Figure 3.5). As detailed in section 7.2, the research intends to explore *remote* uncertainties as these, although they exist, are not reflected currently in financial statements.

As noted in chapter 2, the uncertainty of such events could be estimated and expressed in the form of a fixed interval (and estimating the probability of the occurrence and / or outcome of an event being realised within that interval) or a variable interval (estimating an interval surrounding an

occurrence/outcome with a specified probability). An example of fixed interval and variable interval disclosures of debtors is given in Figure 2.10.

These methods are the most widely used, writes Hull, in management decision making under uncertainty. Others, for example, Thornton (1983, p. 37), have also suggested incorporating tools of management decision making in the disclosure of uncertain events and outcomes. The accommodation of uncertainty in financial statements in such a manner had also been mentioned by the AICPA Objectives Report (1973) and by other writers such as Bedford (1965), Devine (1966) and Vatter (1966) and more recently by Thornton (1983). It may be noted that this approach recognises the dual nature of uncertainty: the uncertainty regarding whether an event will occur ('event uncertainty') and uncertainty regarding the outcome of that event should it occur ('outcome uncertainty'). These uncertainties are central to the dual accounting problems of recognition and valuation: whether to recognise an event and how to value its outcome. The disclosures adopted in this research will attempt to reflect such duality.

Devine (1966, p. 22) argued that

> a little-explored alternative estimates probability numbers for both the amount to be paid and the possibility of having to pay at all and derives an expected value for the unfavourable prospect.

The AICPA's *Statement of Position* (AcSEC, 1994) suggests that financial statements should provide sufficient discussion of significant uncertainties to allow users to assess these uncertainties. The ASB in its draft *Statement of Principles* (1995b) comments that if sufficient evidence is not available regarding the outcome of a transaction (i.e. if the outcome is inestimable) and

> where assets and liabilities are subject to uncertainty, simply reporting a single amount may create an impression of certainty of outcome that may not in fact exist. Hence where the effect of the uncertainty is potentially significant, clear disclosure of the degree of uncertainty surrounding the estimate is necessary. Such disclosure might include the significant assumptions used, the range of

possible outcomes, the basis of measurement and the principal factors that affect what the outcome will be. (ASB, 1995b, p. 78)

The CICA ED *Measurement Uncertainty* (CICA, 1993) contains the same suggestion. A similar disclosure set out by paragraph 24 of FRS 6 *Acquisitions and Mergers* provides more information concerning contingent or deferred consideration (ASB, 1994b, p. 17): 'The nature of any deferred consideration should be stated including, for contingent consideration, the range of possible outcomes and the principal factors that affect the outcome.' They have, however, been restricted to particular instances of future events or contingencies when outcomes or occurrence of outcomes are unknown. Hence, it is not the intention of standard-setters that the disclosure of ranges of uncertainty should have universal application. Suggestions within accounting standards currently are restricted to particular circumstances of high uncertainty where to present potential outcomes as `single numbers' may be misleading.

Similarly, the AICPA *Statement of Position: Disclosure of Certain Significant Risks and Uncertainties* (AsSEC, 1994, p. 5) 'requires disclosures regarding estimates used in the determination of the carrying amounts of assets or liabilities or in disclosure of gain or loss contingencies'. Such disclosures would only be made, the Statement suggests (p. 5),

> when known information available prior to issuance of the financial statements indicates that both of the following criteria are met:
>
> a. It is at least reasonably possible that the estimate of the effect on the financial statements of a condition, situation, or set of circumstances that existed at the date of the financial statements will change in the near term due to one or more future confirming events.
>
> b. The effect of the change would be material to the financial statements.

The additional disclosures of remote and inestimable events that comprises the research instrument will be based on these suggestions. In the first instance, the disclosure of the uncertain nature of

financial statements (as in Figure 2.6) and, secondly, the controlled disclosure of the uncertainty surrounding certain elements of financial statements (drawing from the disclosure in Figure 2.10). In the second case, the disclosure will recognise the dual nature of uncertainty by distinguishing between uncertain (remote) outcome and uncertain (inestimable) occurrence.

The disclosure will therefore comprise three basic elements:

1. The disclosure of the uncertain nature of financial statements;
2. The disclosure of a significant estimate with regard to the inestimable outcome and remote occurrence of a decrease in an asset; and (in order to assess potential differences resulting from the disclosure of uncertain assets and liabilities)
3. Similar to 2, the disclosure of a significant estimate with regard to the inestimable outcome and remote occurrence of an increase in a liability.

By comforming with current *timbre* of accounting standards or principles noted earlier and by disclosing (separately) the uncertain nature of a specific asset and a specific liability for a number of reporting entities, this research differs from that of, for example, Chen (1974), Keys (1978) and others outlined in chapter 4 in the extent of its disclosure and in its hypotheses.

Chapter 7 (section 7.2 particularly) discusses the specific development of the research instrument in this manner. The next section outlines the approach to testing the effect of these disclosures.

5.3 THE RESEARCH APPROACH

'The manner of translating theory to implementation is a critical determinant of the quality of the overall research effort.' (Wallace, 1991, p. 14). Wallace (1991) and Caplan (1972) identify a variety of empirical research methods of research. These include experiments, observation, interviews and surveys. Ryan, Scapens and Theobald (1992) also discuss research methods in the context of accounting and finance, in particular market-based studies, survey-based research and experimental research. Wallace (1991, p. 9) comments that a key element of research design is 'the source of data relevant to the research question.'

The research question in this research is attempting to capture the effect of disclosures of uncertainty in the accounting context. (Specific hypotheses are outlined in chapter 6.) Prior research in the area of assessing the value of accounting information has utilised survey techniques (e.g. Lee and Tweedie (1977 and 1981), Farrelly (1981) and Moizer and Arnold (1984)), market-based research (e.g. Ball and Brown (1968), Beaver (1968) Gonedes (1971), protocol analysis (Day (1986)) and experiments. The results of these studies were discussed in chapter 4.

The disclosures in this research have a number of characteristics which together render experimental methods particularly useful in the context of the disclosure of uncertainty:

a) The disclosure of new information on uncertainty:

The framework within which the disclosures are studied is evolutionary and constitutes an extension of, rather than a radical departure from, current accounting conventions. The disclosures are, however, largely based on proposals within the standard-setting process but, where implemented (for example, in the case of contingent or deferred consideration under FRS 6 (1994b)), are likely to be few and sporadic. The disclosures proposed do not currently appear on a systematic basis in the financial statements of reporting entities. Pope and Marshall (1990), for example, while finding evidence of increased disclosure of 'new financial instruments', found substantial variation in the manner and extent of disclosure. Much of these disclosures were in narrative, unaudited financial reviews. They concluded (p. 61) that disclosures of uncertainty in this context 'will be the subject of ongoing research and debate as disclosure practices in this area evolve.' The disclosures proposed are constructed, artificial. Market reaction to such disclosures or field experiments are therefore not possible as the disclosures do not exist in the market or the field.

Helmstadter (1970, p. 118) comments that a 'distinct advantage of the experimental approach is that it is not limited to the particular combinations and magnitudes of variables and the timing that occurs in natural events. Because of this the experimental approach can add a great deal to

science.' The disclosures which are the subject of this research add to the information disclosed in a financial reporting context. Similarly, the experimental approach can add to our understanding of the role of such disclosures in forming the perceptions of users of financial statements.

b) The need for control:

One of the requirements of this research has been identified as the control of the disclosure regarding uncertainty. Uncertainty is a constant: the disclosure of it is varied. In the context of experiments, Roth (1988, p. 974) comments 'the economic environment is very fully under the control of the experimenter'. Roth argues that 'it is precisely this control of the environment and access to the [decision-making] agents (sufficient to observe and measure attributes that are not controlled) that give laboratory experiments their power'. Coolican (1994, p. 69) also comments that 'if the aim of the experiment is to reduce relevant extraneous variables by strict control then this is best achieved in a laboratory setting, particularly where highly accurate recordings of human cognitive functions (such as memory, perception, selective attention) is required'.

c) The decision-making context of the research:

As noted in chapters 2 and 4, the disclosure of information regarding the risks and uncertainties faced by reporting entities has found support among accounting practitioners. The Financial Reporting Commission in the Republic of Ireland (The Ryan Commission, 1992), the Cadbury Commission (1992) and the AICPA (1994) each proposed with differing emphasis, after some deliberation and (albeit unscientific) public discussion, the disclosure in some form of the uncertain nature of financial statements. The ASB comments in FRS 6 (ASB, 1994b, p. 54) that 'a large majority of the respondents to FRED 6 [which formed the basis of FRS 6] agreed with the proposals it contained'. While this agreement pertained to the wide variety of proposals of which the proposal regarding disclosure of inestimable amounts was only one, that proposal survived in the Standard and therefore would appear not to have attracted significant opposition at least. Farrelly (1981) conducted a survey of the opinions of investors regarding the disclosure of uncertainty regarding the fixed assets of reporting entities. She found support for the notion of

disclosing such uncertainties. Having established that these kinds of disclosures carry some support, the objective of this research is to extend the exploration of such disclosures by studying the reactions, if any, of users of financial statements to disclosures of uncertainty.

The disclosure of uncertainty is in this instance a stimulus. The research hopes to explore reaction, if any, to such a stimulus. Coolican (1994, p. 70) defends laboratory experiments by stating that 'in the study of brain processes, or of human performance, stimulus detection and so on, [the laboratory] is the only place where highly technical and accurate measurement can be made.'

Research regarding uncertainty may have the objective of exploring opinions (through surveys), market reaction (through market-based research) or individual reaction (through field or laboratory experimentation or protocol analysis). This research adopts the latter objective and, for the reasons outlined, proposes to use laboratory experiments as the method of examining the reactions of individuals who are users of financial statements to such disclosures. The next section discusses this approach in more detail.

5.4 THE EXPERIMENTAL FRAMEWORK

5.4.1 The experimental design

Various experimental designs are discussed in a seminal article by Campbell (1957). A discussion of some of these designs, and their weaknesses, will illustrate the potential confounding variables in behavioural experiments and how they might be limited. Such a discussion will also serve to explain why the experiments of this research were designed as proposed.

One potential experimental design is a 'one group pretest-posttest design'. This design would be as follows:

$$X_1 \quad O_1 \quad X_2 \quad O_2 \ldots X_N O_N$$

where X_1 = no disclosure, X_2= (for example) the disclosure of the nature of financial statements and $O_1 \ldots O_N$ = subjects' reaction respectively.

In constructing this type of experiment, the experimenter is attempting to assess the influence of X on the perceptions or behaviour of the decision maker. In this design, as Campbell points out (1957, p. 298), there are however several 'extraneous variables left uncontrolled which . . . become rival explanations of any difference between O_1 and O_2 confounded with the possible effect of X.' The most immediate of these is that the participant reacts purely to the fact of disclosure rather than to its form or content. Intuitively it would appear that most incremental disclosures would elicit a reaction and therefore appear relevant. Other effects include an 'ordering effect' and a 'demand effect'. The first of these suggests that participants will be influenced by the order in which the disclosures are presented rather than the disclosures themselves. The second (hypothesised in the field of psychology by Orne (1962)) suggests that, by exposing participants to all the disclosures, they may discern the objective of the experiment and react accordingly. The 'major cost' of within-subjects design writes Libby (1979, p. 41) is 'what is called 'experimental demand', where knowledge of the manipulation allows the subject to uncover the experimenter's hypothesis and to behave accordingly.'

A response to such limitations has been to conduct experiments over a period of time, to allow for example a period of months to elapse between X_1 and X_2. This gives rise to further confounding variables such as history, maturation and mortality. The first of these describes the potential effect of news (other than X) on the participants. Second, the participants may mature, becoming older, wiser, hungrier, more tired. Third, some participants may not be available for various reasons for the later experiment. The latter two of these effects imply that, effectively, the group at X_1 may not the same group as at X_2.

All of these confounding effects are compounded by the fact that the experiment proposed is not only in two parts but in eight parts as will be outlined in chapter 7. A further limitation of the one group design specific to the accounting context is that a fundamental assumption of accounting is that accounting treatment and disclosure should be consistent. To vary disclosure across companies within the same group of participants is to violate that assumption.

These potential limitations would strongly suggest that a between-group design should be used. This design would vary the disclosures presented to participants *between* groups instead of within groups. This approach is not without its limitations. The most significant of these is the question of whether differences between the reactions of the groups are due to differences between groups rather than the disclosures themselves.

Campbell and others (e.g. Donaldson and Suppes, 1957; Forcese and Richer, 1970 and Kinney, 1986) suggest that this confounding factor may be limited by the random allocation of participants to each group and by having large enough groups that individual differences will be diluted. However, Kinney (1986) cautions that such random assignment of subjects may lead to confounding variables influencing the performance of some groups more than others. Malhotra (1988, p. 228) while commenting that 'randomization is the preferred procedure for ensuring the prior equality of experimental groups' continues that 'it is possible, though, to check whether randomization has been effective by measuring the possible extraneous variables and comparing them across experimental groups.'

Further steps were therefore taken to ensure that differences between groups were not significant. Of crucial importance in this experiment were the participant's ability to use accounting information (the aptitude of the participants) and the participant's *ex ante* perception of the reliability of accounting information (the attitude of the participants). Two tasks will be designed as reproduced in the appendix to chapter 7 to assess whether the aptitude and attitude of the participants in each group was not significantly different and to allow conclusions to be drawn based on the responses of each group.

The first of these asks a set of multiple choice questions to assess the aptitude of participants. The second task elicits participants' attitude to the reliability of various elements of financial statements on a bi-polar scale. This is similar to the approach found by Selto and Cooper (1990) in their review of the control of risk attitudes and an approach discussed by Sherif and Hovland (1961, p. 13) in their exploration of the measurement of attitude in general. Although they found no consistent strategy for controlling subjective risk in accounting research, they did find attempts to measure risk attitudes *ex-ante* or *ex-post* so that the effect of attitude could be controlled (Selto and Cooper, 1990, p. 230). Likewise, Schepanski, Tubbs and Grimland (1992, p. 141) found such 'methodological devices' to be useful in controlling for initial differences between groups. Such instruments were also used by Puto (1987) in his research concerning the effect of initial reference points (such as expectation) on buying decisions.

Both of these tasks will be performed before the experiments themselves. As a result, care will be taken to construct tasks which are general in nature (for example, with one exception not asking for the use of ratios) so that participants are not subsequently led in a particular direction by the tasks assigned. Differences in aptitude among subjects will be controlled by excluding those subjects who do not obtain a satisfactory score (greater than 2 out of 5) in the aptitude test. Attention will be given to differences in subjects' attitude to financial statement items in the exploration of their assessment of the uncertainty disclosed in the research. This is an approach suggested by Kinney (1986, p. 343).

To summarise, a between-groups experimental design is proposed with some consideration of measuring and controlling between-groups to mitigate some of the limitations of between-group design as outlined. The next section considers a further issue regarding the experimental design: that of incentives.

5.4.2 The research design and incentives

Another consideration in the experimental design is the need to provide incentives. Experiments carried out by behavioural scientists, for example, do not place a great emphasis on the need for incentives. The areas of economics and finance (e.g. Thaler, 1987; Roth, 1988; Thaler and Johnson, 1990), however, emphasise the need for incentives to render the experimental process more realistic, with the *caveat* that no incentive schemes are better than inappropriate ones.

In the context of these experiments, two issues are worthy of consideration. The first of these was that central to the thinking of the research was that there was not necessarily an objective reality, a right answer. To indicate otherwise to subjects by rewarding 'right answers' would be to undermine that thinking, to mislead participants and, perhaps, to re-establish the demand effects discussed earlier. As Joyce argues (1989, p. 150), 'monetary incentives cannot be employed because the 'correct' answer is not known.'

Second, the work of MacCrimmon and Wehrung (1986), March and Shapira (1992) and Steil (1993) suggests that incentive mechanisms in organisations are complex and various and that behaviour in organisations is influenced by such incentives and targets. Such incentive mechanisms would be costly and difficult, if not impossible, to replicate in an experimental setting. Furthermore, as Joyce (1989, p. 150) comments 'the potential reward that university researchers can realistically offer . . . for good performance is more likely to be viewed as an insult than as an incentive.'

Incentives will be available to participants to encourage their earnest participation in the experiments. The incentives, however, will be available to those who participated fully in the experiments and not based on 'adequate', 'satisfactory' or 'correct' responses. Participants who participate fully will be entered in a lottery where there is a 1 in 10 chance of winning prizes ranging from £100 to £10. This approach is adopted so as to increase the stakes involved without imposing inordinately high costs on the experimenter. This lottery-type system is similar to the approach

used by, for example, Evans, Heiman-Hoffman and Rau (1994). Bolle (1990) provides evidence that lottery-type incentive schemes do not affect the decision-makers' performance.

5.4.3 Description of experimental subjects

291 subjects took part in the research (66.7% of those contacted). The average age of the subjects was just over 23 years of age. 189 (64.9%) of the subjects were attending a course of study in Dublin City University (see Table 5.1). 86 (29.6%) were third year students of the B.A. in Accounting and Finance degree, 39 (13.4%) were MBS in Accounting students, a further 40 (13.7%) were students on the M.Sc. in Investment and Treasury, 1 was attending another course while the remaining 23 were MBA students. Each of these courses are specialisms in accounting (the B.A. in Accounting and Finance and the MBS in Accounting) or have a strong element of analysis of accounting information. Subjects such as these were used, for example, by Chen (1974) and Birnberg and Slevin (1976) who used MBA students and Chesley (1986) who used MBA and chartered accounting students.

The remaining 102 subjects were graduates who were not attending a course of study at DCU, 66 being graduates of the MBS in Accounting, 27 graduates of the MSc in Investment and Treasury and the remaining 10 being graduates of the BA in Accounting and Finance and other courses. As most (though not all) of those attending the MBS in Accounting, the MSc in Investment and Treasury and the MBA were graduates, the subjects comprised 189 graduates and 102 non-graduates (87 of which were undergraduates).

Table 5.1: Course attendance of experimental subjects.

Course attended	No.	%
NONE	102	35.1
BA in Accounting and Finance	86	29.6
MBS in Accounting	39	13.4
MSc. in Investment &Treasury	40	13.7
MBA	23	7.9
OTHER	1	0.3
Total	**291**	**100.0**

136 (46.7%) of the subjects were in employment (see Table 5.2). The average years in their current employment of these subjects was 2.97 years, ranging from 1 year to 23 years. 40 (13.7%) were employed in 'Big 6' accountancy firms, 17 (5.8%) were in other accountancy firms, 51 (17.5%) in financial institutions, while the remaining 48 (16.5%) were in manufacturing, service or other organisations (of those 34 used financial statements as part of their work). Of those in employment, 124 (80%) were in roles which required the use of financial statements (see Table 5.2).

53 (19.6%) were members of a profession, 41 of which related to accounting or investment research (i.e. the Institute of Chartered Accountants in Ireland, the Chartered Institute of Management Accounting and the Institute of Investment Management and Research). Most of the other professionals were engineers.

Table 5.2: Employment and use of financial statements of experimental subjects.

Employment	None	Use FS	Not use FS
None	134		
'Big 6' accountancy firm		37	4
Other accountancy firm		17	
Financial institution		36	15
Manufacturing organisation		13	3
Service organisation		8	2
Other (e.g. state sector)		13	9
	134	124	33

All subjects were initially tested for their aptitude in the financial reporting context as outlined in chapter 7 and reproduced in the Appendix of that chapter. The average score on the aptitude test was 3.1 correct answers out of 5. 76 subjects scored 2 or less out of 5 in this test and were not used as part of the overall results of the results leaving 215 subjects whose responses will be used in the research. The average score on the aptitude test of these remaining subjects was 3.6 out of 5 or 72.1%. The effects of this filtering will be explored as part of the research results in chapter 11 by examining differences, if any, between the subjects' assessments based on their aptitude to accounting information. The subjects in the research comprised 166 males (57%) and 125 females (43%). Differences between the experimental subjects based on their differing characteristics will be discussed in detail in Chapter 11.

The subjects and the context of the research may undermine respectively what Bracht and Glass (1968) term its *population* validity and its *ecological* validity. The use of student subjects in experiments concerning judgments in accounting has been discussed by several authors (e.g. Dickhaut, Livingstone and Watson, 1972; Abdel-Khalik, 1974 and Ashton and Kramer, 1980). Such discussions appear to discourage the use of student subjects. As studies of judgment in accounting are context specific, the literature suggests in particular that the judgment processes and values of students do not replicate or represent those of, for example, auditors, accountants, bank lenders or investment analysts.

Nevertheless a wide-ranging survey of the literature (particularly the *Accounting Review*, *Journal of Accounting Research* and *Accounting, Organizations and Society*) by Snowball (1986) found that students participated in 70% of the sample studies. This is for reasons of availability but also because, in initial studies of effects of information, students are viewed as a reasonable starting point before proceeding to more detailed, 'real' contexts. Furthermore, Cook and Campbell (1979), for example, argue that at times control and availability strengthen internal validity and that external validity may, initially, need to be weakened for the sake of such internal validity.

Regarding its context (and ecological validity), chapter 3 outlined *inter alia* the importance of the institutional context to investment decision-making. March and Shapira (1987, p. 1409), for example, found that 'managerial risk taking propensities vary across individuals and across contexts.' Each context brings with it its own complexities. However, if each context (including for example reward structures) differs, the replication of each of these contexts is most validly achieved on a context-by-context basis. Such a replication requires perhaps a foundation such as that achieved in this research before embarking on further contextual and institutional explorations. The methodology and approach appropriate in such further research (e.g. case studies) may be different from those employed here.

In this research, the experimental subjects were not homogeneous but constituted subjects with differing experiences and characteristics. Not all, for example, were students. This may undermine the research by creating what Coolican (1994, p. 57) terms 'participant variance: . . . unwanted variance in participants' performance'. Paradoxically, however, in this research the heterogeneity of the subjects serves to mitigage the limitation concerning the representatativeness of the research subjects. Participant variance is limited by the random allocation of the subjects to experimental groups and controlled for by the collection and consideration of the characteristics of the subjects, as described in chapters 7 and 11 respectively. Chapter 11 explores the variances between the performance of participants and finds that this variance is only significant in the case of the effects of gender and current educational status on confidence. This limitation is discussed in chapters 11 and 12 in the light of these findings.

A further consideration is whether the disclosure of additional information exposes participants to information of a nature and in a form possibly not seen by them before. Birnberg (1976) and Chang and Birnberg (1977), for example, comment that additional disclosures may lead to 'information overload' and 'functional fixation'. Users may require a period of learning and adaptation to new forms of accounting treatment and disclosure. On the other hand, Thaler (1987) argues that users do not in fact have the opportunity to learn. They are instead sporadically exposed to new information which they are expected to understand without necessarily having the time to absorb and learn its significance. Furthermore, the research does not concern itself with changes in accounting treatment which has been the subject of numerous other pieces of research in accounting. It involves the disclosure of new information. The feedback from the pilot group (who would not be more sophisticated than the participants of the actual experiments) indicates that the information disclosed is not difficult to understand or apply.

The next chapter outlines the research hypotheses drawing in particular on the behavioural theories explored in chapter 3. Chapter 7 then discusses the experimental design and execution of the experiments.

5.5 CONCLUSION

This chapter has outlined the research method adopted. It discussed the framework within which uncertainty in a financial reporting context may be disclosed. That framework is based on two of the various suggested methods of disclosing uncertainty outlined in Section 2.4. It also outlined the specific disclosures used in the research and the rationale for those disclosures. Specifically these involve, firstly, the disclosure of the uncertain nature of financial statements (results of this disclosure are examined in chapter 8) and, secondly, disclosure of significant estimates in the financial statements regarding the outcome and occurrence of uncertain assets and liabilities (examined in chapters 9 and 10).

The research design was then explored including the experimental method used. In summary, the specific method adopted in the research is experimental using subjects drawn from the business

student and graduate population of Dublin City University. A between-group design is used with lottery-based incentives.

The outline the approach to the research question in this chapter, enables the detailed development of the research hypotheses in the following chapter (Chapter 6). Chapter 7 outlines the design and execution of the experiments and experimental tasks to test these hypotheses. Chapters 8, 9, 10 and 11 will explore the research disclosures and their results in more detail.

CHAPTER 6

THE RESEARCH HYPOTHESES

6.1 INTRODUCTION

This chapter outlines the hypotheses of this research. In doing so, the chapter draws on the discussion of theories of decision-making in the context of uncertainty in chapter 3. These theories are specifically identified and discussed in Sections 6.2 to 6.4.

The hypotheses are also developed within the framework of the disclosure of uncertainty in chapters 2 and 5. This framework comprised three basic elements:

1. The disclosure of the uncertain nature of financial statements;
2. The disclosure of a significant estimate with regard to the inestimable outcome and remote occurrence of a decrease in an asset; and
3. Similar to 2, the disclosure of a significant estimate with regard to the inestimable outcome and uncertain occurrence of an increase in a liability.

These disclosures, chapter 5 outlined, are to be tested in an experimental context. The task outlined for the experimental subjects (which will be concretised in the research instrument in chapter 7) will be to assess the performance and position of the reporting entity (or entities) given such disclosures and also to express their confidence in their assessment.

This chapter now identifies specific hypotheses with regard to the effect on the assessments and confidence of the experimental subjects of these disclosures. Section 6.2 sets out the hypotheses with regard to the disclosure of the uncertain nature of financial statements. Section 6.3 explores the hypotheses concerning the disclosure of the uncertain outcome and occurrence of a decrease in an asset, while Section 6.4 identifies the hypotheses with regard to the uncertain increase in a liability. Hypotheses regarding potential differences between disclosures of uncertainty in the domain of assets and liabilities will also be explored in section 6.4.

Chapter 11 will develop and test some further hypotheses concerning differences between the experimental subjects which are in a sense a by-product of the central direction of this research.

The chapter concludes in Section 6.5 with a summary of the chapter and an assessment of its contribution to the development of the thesis.

6.2 THEORIES OF DECISION-MAKING AND THE DISCLOSURE OF THE UNCERTAIN NATURE OF FINANCIAL STATEMENTS

6.2.1 The Einhorn and Hogarth model and ambiguity

The Einhorn and Hogarth model (Einhorn and Hogarth, 1985 and 1986) explored in chapter 3 recognises the credibility of the source of information as among three distinct sources of ambiguity. Quite apart, therefore, from the context of investment decision-making, ambiguity or uncertainty concerning the information source (i.e. financial statements) may influence the decision-maker's assimilation of such information.

Tversky (1974, p.148) argues that 'the assessment of uncertainty is often based on the intuitive judgments of human beings. Thus, the human subject serves as a measuring

device for the assessment of uncertainty, much as the ruler or the pan balance are used to measure distance and weight.' In the context of Einhorn and Hogarth's model, this measuring device intervenes in two instances, as Einhorn and Hogarth's reporter and evaluator. Such individual differences among 'reporters' has been dealt with by, amongst others, Hofstedt and Hughes (1977), Thomas (1986), Dye (1990), and Newman and Sansing (1993) and it is not proposed to delve in detail into this area but to explore the evaluator's perspective.

Einhorn and Hogarth's proposition is similar to both Keynes' decision-rule (Keynes, 1921) and Kahneman and Tversky's Prospect Theory (Kahneman and Tversky, 1979). At the heart of all three theories is the contention that 'ambiguity' or 'vagueness' affects the perception of choices faced by decision-makers. This ambiguity writes Ellsberg (1961, p. 258) is 'a quality depending on the amount, type, reliability and 'unanimity' of information, and giving rise to one's degree of 'confidence' in an estimate of relative likelihoods.' Ambiguity gives rise not only to the decision-maker's degree of confidence but also to the extent to which the decision-maker's 'adjustment' varies from an initial 'anchor'. This adjustment is a function of ambiguity which in itself is a function of the amount, type, reliability and unanimity of information. It may also be tempered by the decision maker's initial awareness of its ambiguity. In this context lies a focus for the consideration of the usefulness and value of disclosures of information concerning the disclosure of the uncertain nature of financial statements.

As introduced in chapter 5, this research proposes the disclosure of the uncertain nature of financial statements. The null hypothesis suggests that this message will influence subjects' assessment of the performance and position of the reporting entities in question:

H1a: The disclosure of the uncertain nature of financial statements will influence the assessment of performance and position of reporting entities by the experimental subjects.

The model developed by Einhorn and Hogarth and others explored in section 3.2 also gives rise to the hypothesis that *confidence* in decisions will also be affected by increased ambiguity of the information source:

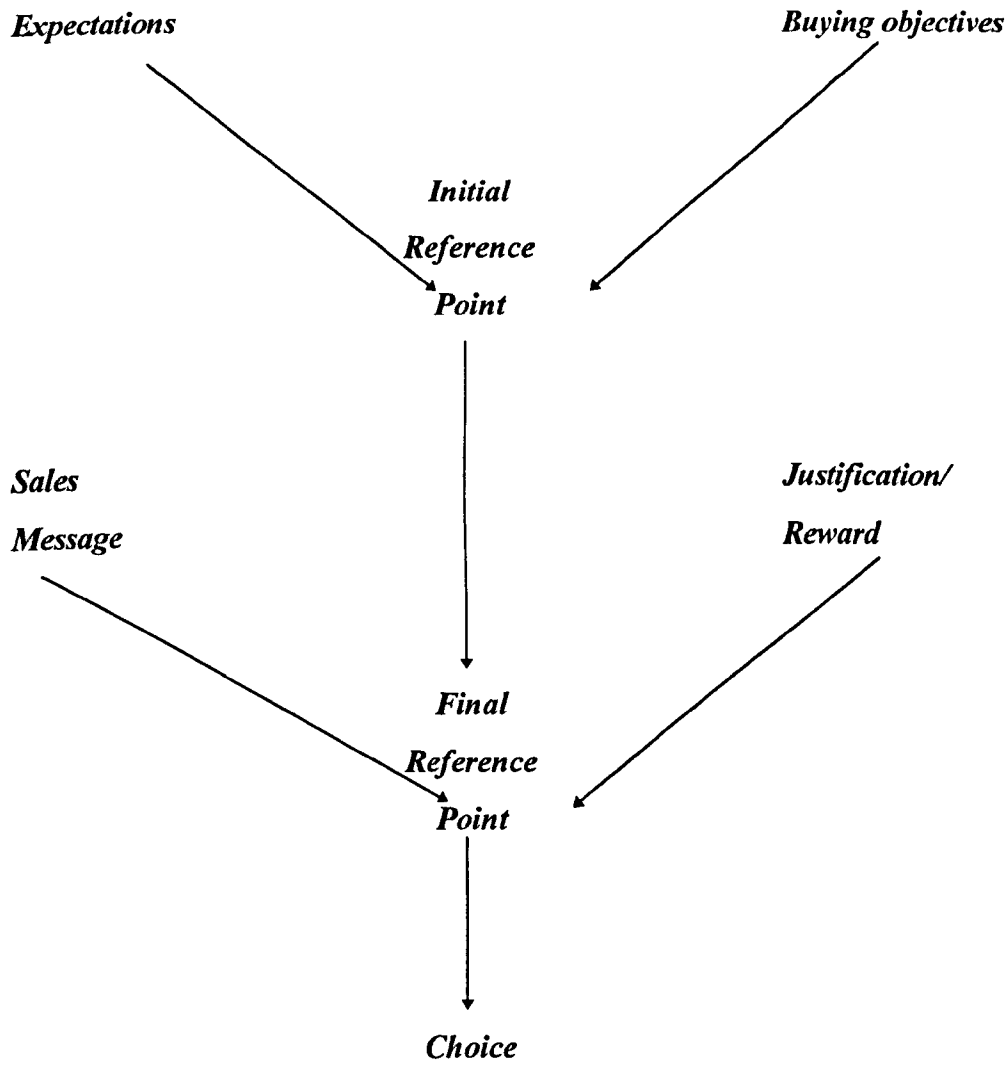
H1b: The disclosure of the uncertain nature of financial statements will influence the confidence of the experimental subjects in their assessment of the performance and position of the reporting entity.

6.2.2 Decision-making and the role of expectations

Puto (1987) also explores a conceptual model of the decision-making process. His concern is the framing by consumers of their buying decision, in particular how the reference points (or anchors) referred to by Kahneman and Tversky (1984) might be developed. Puto's model is reproduced in Figure 6.1. The decision maker's choice, Puto suggests (1987, p. 303), is moulded by expectations and objectives which create an 'initial reference point'. Various environmental factors, such as the sales message (or disclosure) and rewards attached to the purchase decision, can shift the initial reference point to the final reference point. Puto places the relationship between the final reference point and choice in the context of Kahneman and Tversky's Prospect Theory (1979): choices are framed as either gains or losses relative to the final reference point.

In the context of this research, objectives and rewards are assumed to be constant or non-existent. As discussed in chapter 5, the experiment is structured in such a way that no clear objective(s) are identified other than participation by the subjects. Rewards are similarly not linked to objectives or correct answers. The 'message' and initial expectations concerning both that message and the 'product' (the reporting entity in question) remain as potential 'drivers' of users' assessments.

Figure 6.1: Puto's model of the buying decision framing process.



Puto argues (1987, p. 303) that

> buyers approach a purchase decision with a set of expectations about the performance of the item being purchased and a set of specific buying objectives. New or novice buyers will likely have a smaller and possibly less well informed set of expectations than do those with more experience in the product class. Nonetheless the information search

process is likely to produce a set of expectations and objectives that serves as an initial reference point.

Several theories in psychology model the influence of initial expectations on choice. These include assimilation-contrast theory (Sherif, 1963), adaptation-level theory (Helson, 1964) and prospect theory (Kahneman and Tversky, 1979). The first two of these are quite similar. They suggest that decision makers adapt to new information by comparing it with an initial reference point (adaptation-level theory) or range (assimilation-contrast theory). Environmental signals (for example disclosure) stimulate decision makers to reconsider their perceptions. Choice, it is argued, is fashioned by the extent to which the signals confirm or disconfirm original expectations. Signals which fall within expectations may be easily assimilated. Reaction to signals which surprise, on the other hand, may or may not result in altered expectations.

Kahneman and Tversky's Prospect Theory, which was introduced in chapter 3, suggests that decision makers compare outcomes to an initial reference point and react differently to outcomes which represent gains and losses from that initial reference point. Bringing together the arguments of Kahneman and Tversky's Prospect Theory and those of Puto, they both hypothesise an important role for initial expectations or beliefs in the decision making context. Other research in consumer behaviour (e.g. Frankenburger and Liu, 1994; Liefeld and Heslop, 1985 and Blair and Landon, 1981) found that, for example, actual price relative to initial expectations of price determines consumers' assessment of the attractiveness of a product. For example, price below the price that was expected may be perceived as good news, while price above that which was expected may be seen as bad news. Frankenburger and Liu (1994) also found that initial expectations differed between those whom they classified as high- and low-knowledge consumers. These initial expectations were then found to be an important influence on subsequent decisions. Nisbett and Ross (1980, p. 41) draw specifically from Kahneman and Tversky's work to suggest that the initial judgments of subjects 'may prove remarkably resistant to further information . . . Attempts to integrate new information may find the individual surprisingly 'conservative', that is willing to yield ground only grudgingly'. Sherif and Hovland (1961, p. 13) also argue that attitude serves 'as a major anchor in judgment'. Such research

would appear to suggest that expectations of financial statement reliability may be an important determinant of reaction to financial statements and to the disclosure regarding the nature of financial statements.

Helson's adaptation level theory (Helson, 1964) also suggests that past and present experience creates an 'adaptation level' against which fresh stimuli, messages or disclosures are judged. Similar findings have been postulated by Fishbein and Ajzen (1975). They argue that belief and attitude, 'a learned disposition to respond in a consistently favourable or unfavourable manner with respect to a given object' (p. 6) form an important role in behaviour. Other research concerning trading volume in markets (e.g. Karpoff, 1986; Ziebart, 1990 and Lang, Litzenberger and Madrigal, 1992) have been interpreted (e.g. by Barron, 1995) as suggesting that trading volume is affected by revisions of beliefs among analysts. Additional information (such as an earnings announcement) alters expectations. Volume is thus created as market participants trade to adjust their portfolios to reflect their new expectations. Such research suggests that expectations anchor subsequent decisions, that decisions and assessments of current position can be understood in the light of revised expectations and beliefs. This would appear to indicate that assessments of the reporting entity in the light of the information and disclosures supplied will depend on initial expectations of such information and disclosure.

H1c: User reaction to the disclosure of the uncertain nature of financial statements will be influenced by their expectations of the uncertain nature of financial statements.

6.2.3 The role of the characteristics of the reporting entity

As noted earlier, the AICPA argued that 'such disclosure [as that proposed in Figure 2.6] alerts users that uncertainties are present in the financial statements of all reporting entities.' This research also sets out to examine whether the disclosure of this uncertainty affects perceptions of 'all reporting entities'.

The disclosure of the uncertain nature of financial statements reveals the financial statements as a whole as uncertain. If it does influence the subjects' assessments, it may render the value of the firm in particular as more uncertain. Those firms may, as Piaget (1964) and Kahneman and Tversky (1979) in their representativeness heuristic outlined in section 3.2.3.2 suggest, may be perceived as representing an 'absent model'. Firms with a relatively poor position and performance will be more sensitive to uncertainty. Firms with a strong position and / or strong performance may be perceived as being able to withstand the effects of uncertainty more than firms which are seen as marginal or weak. Strong position and / or performance allows some leeway for a firm's fortunes to vary from those presented in the financial statements. This may not be the case for firms which are perceived as less strong.

In particular, firms with high financial leverage or gearing are inherently more sensitive to changes in the value of equity as high gearing indicates a higher sensitivity to volatility. Furthermore, as the equity value of the reporting entity falls, gearing increases. This would appear to suggest that the effect of changes in expectations regarding the uncertain nature of financial statements will be more acute in highly geared firms than in those which are not. This accords with the view expressed by Braun, Nelson and Sunier (1995, p. 1575) that 'if the value of a leveraged firm drops, its equity will, in general, become more leveraged, causing the volatility on equity's rate of return to rise'.

H1d: The disclosure of the uncertain nature of financial statements will affect highly geared reporting entities to a greater extent than those which are not highly geared.

6.3 INCOMPLETE INFORMATION AND THE NEED FOR INFERENCE

Bruner (in Nisbett and Ross, 1980, p. 157) recognising the need for inference, commented that 'the most characteristic thing about mental life . . . is that one constantly goes beyond the information given'. Newell and Simon's theory of human problem solving (1972) argued that the human intellect is limited and needs to use rules of thumb or 'heuristics' to

make sense of the complexities of the world. Heiner (1983, p. 585) calls such heuristics 'smaller behavioural repertoires' which are used because the decision-maker 'cannot decipher all the complexities of the decision problems they face.'

These descriptions of cognitive behaviour are also discussed by Kahneman and Tversky. Tversky (1974, pp. 148 &156) describes such 'mental operations' as: heuristics that are employed in judgment under uncertainty. While these heuristics have provided a basis for some empirical work in accounting particularly in the characterisation of auditing and lending decisions, they draw on broader theories of perception including those of Brunswik (1952), Lenzen (1952) and Litterer (1965). Litterer's model (Figure 3.4) is particularly helpful in describing the 'mechanism' of perception. This perception influences subsequent behaviour. Information (e.g. accounting data) and the experience of the decision-maker are inputs to the model. Decision-makers select certain information from the voluminous information that is received. They interpret that information 'based on (the) past experience and value system of each particular person' (Kast and Rosenzweig, 1970, p. 217). Finally, the decision-maker 'adds to the information input whatever seems appropriate in order to close the system and make it meaningful.'

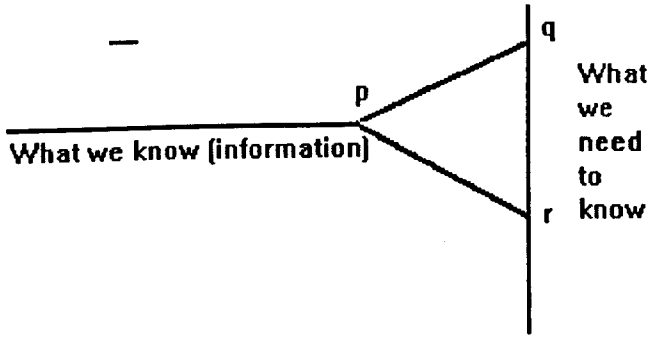
Some evidence supporting Litterer's model has been found in accounting and other areas. For example, Simon and Sumner (1968, p. 220) write of the search for pattern even where 'one may well doubt whether a pattern exists (e.g. in the movements of the stock market).' The argument of Eggleton (1976 and 1982) can be inferred from the title of his paper *Patterns, Predictions and Prototypes*: that, in making predictions, decision-makers faced with a broad range of information seek patterns of which central tendency and variability are 'prototypical'.

The notion that there is a need for closure finds echoes in Mack's definition of uncertainty which was introduced in Figure 2.1. This model is developed further in Figure 6.2a, arguing that as more information is available, the need for inference or 'closure' narrows.

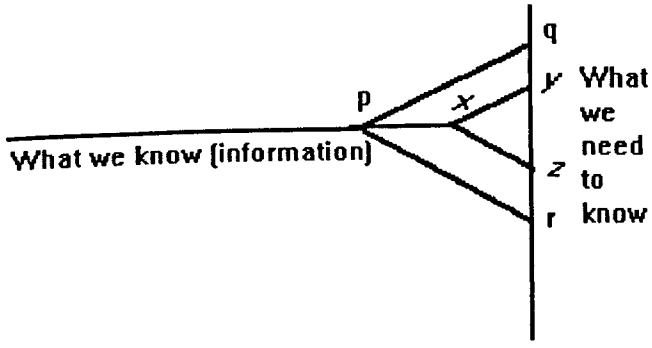
This finds a further development in the area of statistics. Gardenfors and Sahlin (1988, p. 4) describe deFinetti's representation theorem as follows: 'even if two decision makers start out with widely different initial distributions . . . they will end up arbitrarily close to each other, if given sufficient time to experiment with the coin.' Blackwell and Dubins (1962) model the 'merging of opinions' that occurs as more information is made available to decision makers. Such a phenomenon is outlined in a simplified form in Figure 6.2b: as more information is made available to the decision maker, the information 'gap' narrows and the need for 'closure' diminishes. As a result, increased information may lead, *ceteris paribus*, to a more shared view of the world. Increased information therefore leads to a stronger consensus This proposition forms hypotheses **H2g** and **H2h** in Table 6.1 which are tested in section 9.2.5.

Gardenfors and Sahlin (1988, p. 4) develop this idea further: 'one could say that [deFinetti's] representation theorem shows that everyone's subjective probability distribution would converge towards an intersubjective probability distribution if given more and more information about what the world is actually like.' If, as Stamp (1980, p. 124) writes, 'accounting is concerned with the representation of economic reality', increased information may lead to an intersubjective rather than an objective reality, to a firmer social rather than physical reality.

Figure 6.2: Increased information and intersubjective, social reality



a)



b)

Notes: a) When the level of information = p, decision-makers' 'closure' and 'intersubjective, social reality' = qr.

b) When the level of information = x (x>p), *ceteris paribus*, decision-makers' 'closure' and 'intersubjective, social reality' = zy (zy<qr).

Not only does this echo Nurmi's inclusion of 'unanimity' of information as a factor influencing its ambiguity, it is also somewhat similar to the consideration of objectivity in accounting. Mattessich (1978 and 1991) distinguishes between the social and physical realities created by accounting representation. Hines (1987) comments that 'in communicating reality, we construct reality.' She comments further, discussing the development of a conceptual framework (1991, p. 319), that such a framework

requires an 'objective, intersubjective' view of the world. Chambers (1964, p. 269), arguing that while the meaning of objectivity does include the elimination of biases, comments that 'every personal judgment, measurement, statement, has its personal background - it is subjective.' Borrowing from Popper (1961), Chambers continues that objectivity may be described as 'intersubjective testability.' Philosophers such as Husserl (1954) and Dummett (1978) have also emphasised the 'social character of meaning' (Dummett, 1978, p. 424): that the search for an objective truth which is not acknowledged as such by others 'would appear to involve the same fallacy as 'they're all out of step but our Willie' '.

This is not only of esoteric interest but is also, if explored further, of interest in the context of a market. An active market results from many factors: differences in wealth, preference, access to information but also from differences in opinion or perception. If the availability of information narrows such differences of opinion, what May and Sundem (1976, p. 760) term 'aggregate market consequences' may also be affected. This concern with consensus is also examined by Klammer and Reed (1990) in the context of the level of disclosure in cash flow statements. They found that increased disclosure of cash flows led to increased consensus among bank loan officers.

Research by Budescu and Wallsten (1985), Chesley and Wier (1985), Chesley (1986) and Larsson and Chesley (1986) established that

> phrases are not as crisp as numbers, and therefore they do add a dimension to reported opinion that single numbers lack. [However] phrases have different locations to different individuals . . . phrases differ in vagueness . . . Thus, it is quite possible that a given phrase will imply differential imprecision, vagueness, or fuzziness to different individuals. (Budescu and Wallsten, 1985, p. 403)

Ross and Nisbett (1980) remark that the vividness of messages affects the perceptions of them constructed by those receiving such messages. The perceiver, they argue (p. 17), 'is an active interpreter, one who resolves ambiguities, makes educated guesses about events that cannot be observed directly, and forms inferences about associations and causal relations'. The disclosure of uncertain assets in these experiments adds the crispness and

the vividness of numbers to the ambiguity and the fuzziness of phrases. As outlined in chapters 5 and 7, it will do so on two dimensions: firstly, the probability of a remote event (defined as a range of probabilities) and secondly the inestimable outcome of that remote event (narrowing 'inestimable' to a range).

Other research, representing variations on the theme of the disclosure of probability measures, has been carried out by Oliver (1972), Birnberg and Slevin (1976), Keys (1978), Chen and Summers (1981) and Coats and Chesser (1982). This research, which is discussed in detail in chapter 4, arrived at various conclusions depending on the structure of the information provided and nature of the participants. Birnberg and Slevin, for example, concluded (p. 153) that 'the presence of a formal confidence interval statement did not yield significant differences in the subject's decision' as (p. 156) 'apparently the skilled user of financial statements already possesses a notion of the relative size of the confidence interval around the point estimate from past experience.' Chen and Summers (1981, p. 13) found, however, that 'removing the appearance of certainty from accounting affects decision making behaviour.' They also comment that 'a mere indication of the uncertain nature of the reported figure does not necessarily provide subjects with more information than the conventional single-valued accounting figure.'

6.3.1 Research hypotheses: uncertain assets.

The theories of decision-making and confidence formation underlying the research hypotheses were outlined in chapter 3. Drawing on the research of, for example, Budescu and Wallsten (1985) in the behavioural area and that of, for example, Chesley (1986), Chen (1974) and others in accounting, hypotheses **H2a** to **H2f** set out in Table 6.1 are proposed. The theories characterising uncertainty as a lack of unanimity of information and of additional information potentially leading to greater consensus formalised in Figure 6.2 lead to hypotheses **H2g** and **H2h** in Table 6.1.

Table 6.1: Research hypotheses: uncertain assets

H2a	The disclosure of an asset whose occurrence is remote and whose outcome is inestimable will affect the assessment of the performance and position of the reporting entities by the experimental subjects.
H2b	The disclosure of an asset whose occurrence is remote and whose outcome is inestimable will affect the confidence of the experimental subjects in their assessment of the performance and position of the reporting entities.
H2c	The disclosure of the range of probability of a remote event which may affect an asset will affect the assessment of the performance and position of the reporting entities by the experimental subjects.
H2d	The disclosure of a range of probability of a remote event which may affect an asset will affect the confidence of the experimental subjects in their assessment of the performance and position of the reporting entities by the experimental subjects.
H2e	The disclosure of a range of outcomes of an event whose outcome is inestimable will affect the assessment of the performance and position of the reporting entities by the experimental subjects.
H2f	The disclosure of a range of outcomes of an event whose outcome is inestimable will affect the assessment of the performance and position of the reporting entities by the experimental subjects.
H2g	The disclosure of information concerning the range of probability of a remote event will lead to greater consensus among the experimental subjects concerning the performance and position of the reporting entities.
H2h	The disclosure of information concerning the range of outcomes of an event whose outcome is inestimable will lead to greater consensus among the experimental subjects concerning the performance and position of the reporting entities.

6.4 HYPOTHESES CONCERNING THE DISCLOSURE OF UNCERTAIN LIABILITIES

Similar hypotheses to those proposed in the domain of assets are proposed in the context of liabilities in Table 6.2. These hypotheses reflect the asymmetrical approach to the recognition of financial statements outlined in chapter 2 and in section 6.3, based on, for example, FRED 14's argument (ASB, 1997b, p. 15) that 'the concept of prudence requires stronger evidence for recognising a gain than a loss and often results in a loss (and any associated liability) being recognised where a gain (and any associated asset) would not be recognised'.

Table 6.2: Research hypotheses: uncertain liabilities.

H3a	The disclosure of a liability whose occurrence is remote and whose outcome is inestimable will affect the assessment of the performance and position of the reporting entities by the experimental subjects.
H3b	The disclosure of a liability whose occurrence is remote and whose outcome is inestimable will affect the confidence of the experimental subjects in their assessment of the performance and position of the reporting entities.
H3c	The disclosure of the range of probability of a remote event which may affect a liability will affect the assessment of the performance and position of the reporting entities by the experimental subjects.
H3d	The disclosure of a range of probability of a remote event which may affect a liability will affect the confidence of the experimental subjects in their assessment of the performance and position of the reporting entities by the experimental subjects.
H3e	The disclosure of a range of outcomes of an event whose outcome is inestimable will affect the assessment of the performance and position of the reporting entities by the experimental subjects.
H3f	The disclosure of a range of outcomes of an event whose outcome is inestimable will affect the confidence of the experimental subjects in their assessment of the performance and position of the reporting entities.

H3g	The disclosure of information concerning the range of probability of a remote event will lead to greater consensus among the experimental subjects concerning the performance and position of the reporting entities.
H3h	The disclosure of information concerning the range of outcomes of an event whose outcome is inestimable will lead to greater consensus among the experimental subjects concerning the performance and position of the reporting entities.

6.4.1 Differences In Assessments In The Context Of Assets And Liabilities

As outlined in section 5.2, accounting conventions demand an asymmetric approach to the recognition (though not necessarily the measurement) of assets and liabilities. Conventional disclosure requires a lower threshold of recognition for liabilities. Such an approach manifests itself in the requirement of, for example, SSAP 2 that liabilities with a greater than remote probability be disclosed (ASC, 1971) and the suggestion in a draft of the *Statement of Principles* (ASB, 1995b) and FRED 14 (ASB, 1997b) that more evidence is required for the recognition of an asset than the recognition of a liability.

If more evidence is required for the recognition of an asset than the recognition of a liability, we should expect that information regarding uncertain assets will cause more concern than the same information regarding uncertain liabilities. In particular, such expectations leads to hypotheses **H3i** to **H3l** outlined in Table 6.3.

The ASB's suggestion that greater evidence is required for the recognition of assets than liabilities does not explicitly differentiate between occurrence and outcome. The criteria for recognition include the constraints of reliable evidence of existence (occurrence) and measurement (outcome). Hence there are further potential hypotheses in Table 6.3, **H3m** to **H3p**, drawing on the apparent equal weight given to evidence of occurrence and outcome.

Table 6.3: Research hypotheses: differences in the assessments of assets and liabilities:

H3i	The assessment of the performance of the reporting entities by the experimental subjects who receive the disclosure of information concerning uncertain assets will be less than the assessment of the performance of the reporting entities by the experimental subjects who receive the same information concerning uncertain liabilities.
H3j	The confidence expressed in their assessment of performance by the experimental subjects who receive the disclosure of information concerning uncertain assets will be less than the confidence in their assessment of the performance of the reporting entities by the experimental subjects who receive the same information concerning uncertain liabilities.
H3k	The assessment of the position of the reporting entities by the experimental subjects who receive the disclosure of information concerning uncertain assets will be less than the assessment of the performance of the reporting entities by the experimental subjects who receive the same information concerning uncertain liabilities.
H3l	The confidence expressed in their assessment of the position of the reporting entities by the experimental subjects who receive the disclosure of information concerning uncertain assets will be less than the confidence in their assessment of the performance of the reporting entities by the experimental subjects who receive the same information concerning uncertain liabilities.
H3m	The lower assessment of the position of the reporting entities by the experimental subjects who receive the disclosure of information concerning uncertain assets relative to those receiving information concerning uncertain liabilities will not differ between the disclosure of outcome and occurrence.
H3n	The lower expression of confidence in the assessment of the position of the reporting entities by the experimental subjects who receive the disclosure of information concerning uncertain assets relative to those receiving information concerning uncertain liabilities will not differ between the disclosure of outcome and occurrence.

H3o	The lower assessment of the performance of the reporting entities by the experimental subjects who receive the disclosure of information concerning uncertain assets relative to those receiving information concerning uncertain liabilities will not differ between the disclosure of outcome and occurrence.
H3p	The lower expression of confidence in the assessment of the performance of the reporting entities by the experimental subjects who receive the disclosure of information concerning uncertain assets relative to those receiving information concerning uncertain liabilities will not differ between the disclosure of outcome and occurrence.

6.5 CONCLUSION

This chapter has outlined the hypotheses of the research. These hypotheses are essentially and in broad terms three-fold:

1. The disclosure of the uncertain nature of financial statements will affect the assessments of performance and position of the reporting entities and the confidence expressed in those assessments by the experimental subjects (outlined in Section 6.2);
2. The dislosure of the uncertain outcome and / or occurrence of a decrease / increase in an asset / liability respectively will affect the assessments of performance and position of the reporting entities and the confidence expressed in those assessments by the experimental subjects (outlined in Section 6.3 and 6.4 and Tables 6.1 and 6.2); and
3. The asymmetric treatment of assets and liabilities will result in differing effects on the assessments and expressions of confidence with respect to assets and liabilities (outlined in section 6.4 and Table 6.3).

The disclosures in question have their origins in policy proposals discussed in chapters 2 and 5. The hypotheses, on the other hand, are born from theories whose evolution is explored in chapter 3 and which are detailed and focussed further in this chapter. Chapter 7 regarding the research instrument puts flesh on the research approach

discussed in chapter 5 to test the hypotheses outlined in this chapter. Chapter 8 to 10 discuss the research results with respect to these hypotheses. In particular, chapter 8 outlines the results of tests of the hypotheses concerning the disclosure of the uncertain nature of financial statements (developed in section 6.2). Chapter 9 then explores the tests of the hypotheses regarding the disclosure of uncertain assets (from section 6.3). Chapter 10 brings this discussion further by examining the hypotheses in the context of liabilities and the asymmetrical treatment of assets and liabilities (as outlined in section 6.4).

CHAPTER 7

THE RESEARCH INSTRUMENT

7.1 INTRODUCTION

Chapter 5 outlined the general details of the disclosure to be explored in this research: first, that financial statements are uncertain (Figure 2.6) and, second, the disclosure of uncertainty attached to particular assets and liabilities. Furthermore, the potential was identified in chapter 6 for the examination of differences between uncertain assets and liabilities. The use of experimental research to test the broad research questions was also proposed and defended in chapter 5. Specific research hypotheses were set out in chapter 6.

The specification of the research approach in chapter 5 and of the research hypotheses in chapter 6 allow this chapter to deal with the development of the research instrument and, in broad terms, the execution of the research. The chapter is in three main sections. Section 7.2 reiterates briefly the search for a framework within which to test the hypotheses put forward as part of the research. In particular, this section specifies the nature of the uncertainty to be disclosed. Section 7.3 outlines the detailed design of the research instrument. Section 7.4 sets out the manner in which the research was executed.

7.2. THE DISCLOSURE OF UNCERTAINTY

The current position regarding the disclosure of uncertainty as set out in accounting standards is discussed in chapter 2 and Sections 5.2.1 and 5.2.2. The primary accounting standard dealing with uncertain events is SSAP 18 *Accounting for Contingencies*. This standard requires the assessment of probabilities within three broad categories. 'Remote' events are neither recognised or disclosed. 'Probable' events are recognised if they would result in losses (or an increase in liabilities) and disclosed if they would result in gains (or an increase in assets). 'Reasonably certain' assets and liabilities are recognised.

As noted in chapters 2 and 5, the ASB demands greater evidence for the existence of an asset than for the existence of a liability. This asymmetrical approach is also found in SSAP 18 *Accounting for Contingencies*. The Standard requires recognition or disclosure based on uncertainty of occurrence as set out in Figure 2.4. The recognition of gains and losses rests on whether those gains and losses are remote, possible or probable. Uncertainty of outcome is addressed by the requirement that, in the case of gains and losses, the gain or loss must be estimable with 'reasonable accuracy' (ASC, 1980, para. 15). If the outcome is 'inestimable', uncertain gains and losses which are not remote (i.e. which are possible or probable) should be disclosed, but with no indication of the (inestimable) outcome.

Chapter 3 discussed the work of Chesley (1986, p. 180), for example, who points out that 'the accuracy of the interpretation of . . . words by preparers and users of financial statements is an area that should be of concern. A word such as 'likely' may be interpreted as .70 or .90 by various readers. What might be important at .90 may not be at .70'. In particular, he found different interpretations of such phrases in different professions (accountants and lawyers) and groups of students (chartered accounting students and MBAs). He therefore goes on to suggest (p. 180) that 'perhaps numerical ranges could be promulgated to suggest how one should interpret such words rather than presenting other qualitative words in authoritative pronouncements such as 'high' or 'slight' as is presently done.' This concern is shared by Tweedie and Whittington

(1990, p. 98) who outline the need 'for a more precise definition of . . . reasonable certainty [required] as a condition for recognition in the accounts.'

The Canadian Institute of Chartered Accountants issued an Exposure Draft (ED 4 *Contingent Gains and Losses*) in 1993 addressing the issue of contingencies. Although commenting that the determination of the appropriate categories of probability is the responsibility of management and therefore not possible to define with precision, the ED attempts to set out approximate ranges of probability for each category. These ranges are outlined in Figure 7.1. The ED also argues for the disclosure of a remote event where the outcome of such an event is potentially catastrophic.

Figure 7.1: Approximate probabilities of events confirming contingencies (CICA, 1993).

Determined probability	**Approximate %**
Likely	> 50 - 99%
(Virtually certain)	(91-99%)
Neither likely nor unlikely	50%
Unlikely	1 - < 50%
(Remote)	(1 - 15%)

In accordance with SSAP 18, contingent losses which are probable are recognised in the financial statements. Other non-remote contingent losses are disclosed. Contingent gains are not recognised in the financial statements, are only disclosed when probable and only recognised when

reasonably certain. Uncertain gains and losses (and hence assets and liabilities) are, therefore, for the most part, treated asymmetrically. Exceptions are when the potential occurrence of the event is remote or reasonably certain. Remote gains and losses are neither recognised nor disclosed. Reasonably certain gains and losses are recognised.

One of the objectives of the research is to assess differences between uncertain assets and liabilities. The research intends to explore *remote* uncertainties as these, although they exist, are not reflected currently in financial statements (defined by the CICA ED (CICA, 1993) as a probability of less than 15%.) This relatively narrow approach is defensible theoretically and pragmatically. On theoretical grounds, as described in chapter 5, Thornton (1983) discusses the problem of 'zero-infinity' risks: those having a chance of occurrence close to zero but an outcome with almost infinite consequences. These remote events need not currently be disclosed in financial statements although 'remote percentages of risk lose their significance to those unfortunate enough to be 100% involved.' (McCarthy J. in Walsh v. Family Planning Services Limited, The High Court of Ireland, 1987 No. 1053P)

Pragmatically, in assessing changes in assets and liabilities, their accounting treatment (as well as the level of probability which triggers them) should be symmetrical. The intention is to explore disclosures where there is a remote possibility of an event impacting on specified elements of the financial statements. The outcome of the remote event is inestimable. In one instance, this event would not be disclosed (as currently), while in other instances more information regarding this uncertain event and its outcome would be disclosed. Such uncertainty, it was argued (after, for example, Hull and the ASB), encompasses both outcome and occurrence.

Kahneman and Tversky's Value Function in Figure 3.5 (based on the postulates of their Prospect Theory (Kahneman and Tversky (1979)) suggests, in brief, that decision makers are risk averse when gaining and risk seeking when losing. To avoid such potential confounding effects on behaviour, potential losses only (i.e. decreases in assets or increases in liabilities) are presented. The losses in assets and liabilities were of a nature that would be (potentially though not actually) recognised in the profit and loss account (rather than, say, the Statement of Total Recognised

Gains and Losses) of the year under consideration. The losses therefore concern current assets and current liabilities. Furthermore, the potential extent of losses is identical. The maximum potential decrease in an asset for example is limited to the amount at which the asset is stated in the balance sheet, while potential liabilities may be unlimited. A liability must therefore identified which could be 'capped' so as to limit potential losses. Products sold under guarantee is considered to be such a liability. A scenario is presented where sales worth £900,000 have been sold under guarantee. There is a remote possibility of the guarantees arising and, if they arose, the outcome is inestimable (although limited to £900,000). In the case of assets, stock worth £900,000 is potentially obsolete. There is a remote possibility of obsolescence and, if the stock is obsolete, the extent of the losses is inestimable (although limited to £900,000).

There are, therefore, two layers of disclosure of information risk. The first layer, comprising one disclosure X_2, reveals the uncertain nature of financial statements. The second layer, relates to assets and liabilities (two sets of disclosure) with three (a broad disclosure followed by a clarification of occurrence and outcome) different disclosures in each case. (The second layer thus has 2 * 3 = 6 elements.) There are therefore 8 levels of disclosure as follows:

X_1 = no disclosure

X_2= disclosure regarding the uncertain nature of financial statements

A1= disclosure that there is a remote chance that stock may be obsolete with an inestimable outcome

L1 = disclosure that there is remote chance of a liability for sales under guarantee with an inestimable outcome

A2 = as A1 with more disclosure regarding the remote chance of occurrence

L2 = as L1 with more disclosure regarding the remote chance of occurrence

A3 = as A2 with more disclosure concerning the inestimable outcome

L3 = as L2 with more disclosure concerning the inestimable outcome

Disclosure X_2 was introduced in Figure 2.6. Disclosures A1 and L1 to A3 and L3 are outlined in Figures 7.2 to 7.7.

Figure 7.2: Disclosure A1 that there is a remote chance that stock may be obsolete with an inestimable outcome

Extract from the financial statements:

Stock at 31 December 1995 includes finished goods costing approximately £900,000 which may be obsolete (1994: none). The Directors are unable to estimate the net realisable value of this stock. The likelihood that this stock is obsolete is remote. In the light of the uncertainties outlined, no provision has been made in the financial statements in respect of this stock.

Figure 7.3: Disclosure L1 that there is remote chance of a liability for sales under guarantee with an inestimable outcome

Extract from the financial statements at 31 December 1995:

Some sales of the Company have been made under guarantee (1994: none). The Directors are unable to estimate the ultimate cost of these obligations. The likelihood that a claim will be made against the Company in respect of these guarantees is remote. The estimated cost of fulfilling the Company's obligations if all guarantees were claimed would not exceed approximately £900,000. In the light of the uncertainties outlined, no provision has been made in the financial statements in respect of the guarantees.

Figure 7.4: Disclosure A2 as A1 with more disclosure regarding the remote chance of occurrence

Extract from the financial statements at 31 December 1995:

Stock at 31 December 1995 includes finished goods costing £900,000 which may be obsolete (1994: none). The Directors estimate that the likelihood that this stock is obsolete is remote. The net realisable value of obsolete stock is normally between 35% and 65% of cost. In the light of the uncertainties outlined, no provision has been made in the financial statements in respect of this stock.

Figure 7.5: Disclosure L2 as L1 with more disclosure regarding the remote chance of occurrence

Extract from the financial statements at 31 December 1995:

Some sales of the Company have been made under guarantee (1994: none). The Directors estimate that the likelihood of a claim being made is remote. The cost of claims under guarantees are normally between 35% and 65% of the total obligation. The estimated cost of fulfilling the Company's obligations if all guarantees were claimed would not exceed approximately £900,000. In the light of the uncertainties outlined, no provision has been made in the financial statements in respect of these guarantees.

Figure 7.6: Disclosure A3 as A2 with more disclosure concerning the inestimable outcome

Extract from the financial statements at 31 December 1995:

Stock at 31 December 1995 includes finished goods costing £900,000 which may be obsolete (1994: none). Based on past experience, the Directors estimate that the likelihood that this stock is obsolete is between 5% and 8%. The net realisable value of obsolete stock is normally between 35% and 65% of cost. In the light of the uncertainties outlined, no provision has been made in the financial statements in respect of this stock.

Figure 7.7 Disclosure L3 as L2 with more disclosure concerning the inestimable outcome

Extract from the financial statements at 31 December 1995:

Some sales of the Company have been made under guarantee (1994: none). The estimated cost of fulfilling the Company's obligations under guarantees would not exceed £900,000. Based on past experience, the Directors estimate that the likelihood of a claim being made is between 5% and 8%. The cost of claims under guarantees are normally between 35% and 65% of the total obligation. In the light of the uncertainties outlined, no provision has been made in the financial statements in respect of these guarantees.

The disclosures evolve from no disclosure (as currently) to disclosures which include disclosures proposed in a general context (e.g. by the AICPA and the ASB) or in a specific context (by the ASB in FRS 6). The level of uncertainty does not change: it is merely revealed. The financial statements are as uncertain in each disclosure, the disclosure of the uncertain nature of financial statements (Figure 2.6) merely reveals that this is so. The uncertain events are always remote (and therefore not currently disclosed) and inestimable. Further disclosure merely reveals iteratively the basis on which judgment is made. The research question (developed in as hypotheses in chapter 6)

is that such disclosure matters: that it is relevant, in the ASB's (ASB, 1995b, p. 42) terms that it 'has the ability to influence the decisions of users'. More specifically, as the role of financial statements is to provide information on the financial position, performance and financial adaptability of the reporting entity (ASB, 1995b, p. 35), the research examines the effect, if any, of such disclosures on users' perceptions of financial position and performance.

Subjects are asked to assess the performance and position of each company on a scale which was divided into deciles having endpoints of 0 to 100 labelled 'poor' and 'excellent' respectively with a midpoint of average. This is similar to the mechanism adopted by Moser (1989). Participants are asked to indicate their confidence (on a scale of 0 to 100) in their assessments of performance and position. They were not asked to stake any investment or other wealth in the companies. This was to avoid the potentially confounding effects of risk attitude discussed, for example, by Selto and Cooper (1990).

7.2.1 Characteristics of the reporting entities

In order to enrich the potential findings and to consider the effects of the disclosure on reporting entities with differing characteristics as outlined in Hypothesis **H1d**, the disclosure related to five different reporting entities. The profit and loss account and balance sheet for three years of five companies were presented, each containing only the disclosures outlined. These financial statements are reproduced in the Appendix to this chapter.

Each company is approximately the same size. Each has a share capital of 1,000,000 £1 shares. The average turnover of the five reporting entities was £10,693,000 with the average of each entity's turnover over the three years in question not more than 18% more or less than that average. In order to control for the effects of asymmetrical reaction to gains and losses postulated by, for example, Kahneman and Tversky (1979) all the entities report profits in excess of the potential losses disclosed of £900,000.

They are all in the same sector (information technology). This sector is chosen as it is characterised by uncertainty and the scenarios of obsolete stock and sales under guarantee are appropriate to the sector. The financial structure of one of the companies (e.g. its profitability, liquidity and fixed asset levels) is based on a real company of a similar size within the sector, Printech International plc. The other companies are limited variations of that structure. The P\E ratio of the sector, which comprises only the companies whose financial statements are supplied, is given for each of the last two years but not for the current year.

Each company has different characteristics based on the ratios suggested to be indicative of accounting *beta* by Beaver *et al.* (1970) (i.e. growth, liquidity, gearing, earnings variability and earnings covariability). The key characteristics of each entity are presented in Figure 7.8. These characteristics are described as follows:

(1) A high growth company (HG) experienced growth in turnover of 300% over three years (approximately 75% on average per annum). This growth is matched by growth in dividends and assets (both current and fixed). Due to the constant level of share capital, the growth in fixed assets is financed primarily by borrowings. The growth in current assets led to improved liquidity. Although HG is characterised by high debt, this is mitigated by growth in turnover and fixed assets, healthy liquidity and interest cover. The ambiguity of HG (ambiguity being one of the themes of the research) will be discussed as part of the exploration of the research results in section 10.3.3.

(2) Conversely, a company with declining growth (DEC) shows a decline in turnover of 15% over the three years which was also reflected in declining profits. Fixed assets and borrowing also declined somewhat.

(3) A third company (STA) shows relatively static growth (although increasing by about 1.5% per annum, this represents static real growth). Similarly, profits remain stagnant. An increased level of retained earnings finances increased liquidity and fixed assets.

(4) A fourth company (HD) shows a high level of debt along with poor liquidity. This manifests itself particularly in no cash in hand, an increasing level of short-term and long-term creditors and a correspondingly increasing level of interest expense in the profit and loss account. Thus, HD represents a high level of gearing with a resultant impact on the fixed cost of interest in the profit and loss account. Dividends paid and proposed remain static.

(5) The fifth company (ND) has no debt (specifically creditors greater than one year) and correspondingly no interest expense in the profit and loss account. Turnover grew moderately by 8% per annum. Profitability and liquidity improved in line with the improvement in turnover.

Figure 7.8: Selected characteristics of reporting entities.

Company	*High Growth (HG)*	*Declining (DEC)*	*Stable (STA)*	*High debt (HD)*	*No debt (ND)*
Ratio					
Turnover growth	**High**	**Low**	Average	Average	Average
Interest cover	Average	High	Average	**Low**	**High**
Liquidity	Average	Average	Average	**Low**	**High**
Debt/Equity	High	Average	Average	**High**	**Low**

In summary, therefore, the research instrument attempts to capture a variety of characteristics in the five reporting entities which comprise the instrument. Each of the entities has a primary but not exclusive characteristic revolving around levels of turnover and borrowing. The nature of the industry and the constraints of maintaining a level of profitability in excess of £900,000 resulted in some of the reporting entites displaying other characteristics such as high levels of assets.

7.3 PILOT-TESTING OF THE RESEARCH INSTRUMENT

The research instrument and experimental design was pilot-tested with a group of approximately 100 undergraduates specialising in accounting. This group (comprising second year undergraduate students) was not subsequently part of the experiment and did not have more experience of financial statements than the experimental group. The experiments were discussed with the group as a whole and, subsequently, with a smaller focus group drawn from the pilot-test group.

The experimental task in the pilot-test comprised the assessment of performance and position and also an estimate of future share value of the reporting entities based on the information given. It also included an expression of confidence by the subjects in each of these three assessments. The elements of the task relating to the estimate of share value (and confidence in that estimate) were not continued in the experimental task that comprises the remainder of the research for reasons outlined later in this section.

The results of the pilot test are shown in tables 7.1 to 7.6.

Table 7.1[1]: Mean assessment of the position of the reporting entities - pilot testing.

Reporting entity	Control	Unc.	A1	A2	A3	L1	L2	L3
	(n= 9)	*(n=11)*	*(n=11)*	*(n=11)*	*(n=14)*	*(n=9))*	(n=11)	(n=14)
High debt (HD)	49.4	36.8	43.8	39.1	48.6	47.2	48.2	34.3
Declining (DEC)	38.9	45.5	40.0	60.9	64.3	47.8	52.0	36.4
Stability (STA)	57.8	70.0	68.8	51.4	57.9	68.3	59.1	47.5
High growth (HG)	63.9	53.6	60.8	52.7	53.9	71.7	70.9	56.4
No debt (ND)	62.8	75.9	71.7	65.0	70.7	75.6	72.3	63.6
Total	54.6	56.4	57.0	53.8	59.1	62.1	60.5	47.6

[1] Key to tables:
Control: No disclosure.
Unc.: Disclosure of the uncertain nature of financial statements as in Figure 2.6.
A1: Disclosure of uncertain stock as in Figure 7.2.
A2: Disclosure of uncertain stock as in Figure 7.4.
A3: Disclosure of uncertain stock as in Figure 7.6.
L1: Disclosure of uncertain guarantee as in Figure 7.3.
L2: Disclosure of uncertain guarantee as in Figure 7.5.
L3: Disclosure of uncertain guarantee as in Figure 7.7.

Table 7.2[2]: Mean assessment of the performance of the reporting entities - pilot testing.

Reporting entity	Control	Unc.	A1	A2	A3	L1	L2	L3
	(n= 9)	*(n=11)*	*(n=11)*	*(n=11)*	*(n=14)*	*(n=9))*	*(n=11)*	*(n=14)*
High debt(HD)	41.3	40.0	44.2	35.5	51.4	60.0	39.5	37.5
Declining (DEC)	53.3	45.5	44.6	43.2	52.3	40.6	48.0	40.0
Stability (STA)	55.6	68.2	62.5	49.5	50.4	63.3	55.5	51.4
High growth (HG)	64.4	64.5	65.0	50.9	60.7	73.3	47.4	60.4
No debt (ND)	67.2	65.9	64.6	66.8	64.6	71.7	70.0	69.3
Total	56.4	56.8	56.2	49.2	55.9	61.8	52.1	51.7

Table 7.3[2]: Mean expression of confidence in the assessment of the position of the reporting entities - pilot testing.

Reporting entity	Control	Unc.	A1	A2	A3	L1	L2	L3
	(n= 9)	*(n=11)*	*(n=11)*	*(n=11)*	*(n=14)*	*(n=9)*	*(n=11)*	*(n=14)*
High debt (HD)	65.0	70.0	49.5	65.9	63.2	74.4	55.5	72.5
Declining (DEC)	65.0	67.3	51.4	60.9	64.3	71.7	63.2	68.2
Stability (STA)	50.0	70.9	57.3	61.8	65.7	72.2	69.1	68.9
High growth (HG)	58.9	65.9	57.3	65.9	69.3	72.2	68.2	71.8
No debt (ND)	61.7	68.2	57.9	61.4	66.8	77.8	63.6	67.5
Total	60.1	68.5	55.7	63.2	65.9	73.7	63.9	69.8

[2] For key to table see footnote 1.

Table 7.4[3]: Mean expression of confidence in the assessment of the performance of the reporting entities - pilot testing.

Reporting entity	Control	Unc.	A1	A2	A3	L1	L2	L3
	(n= 9)	*(n=11)*	*(n=11)*	*(n=11)*	*(n=14)*	*(n=9)*	*(n=11)*	*(n=14)*
High debt (HD)	61.7	65.9	55.0	64.1	68.2	66.7	57.3	70.0
Declining (DEC)	53.3	68.2	46.8	62.3	66.4	73.3	63.2	66.4
Stability (STA)	56.7	66.4	57.7	60.0	66.1	67.2	66.4	64.3
High growth (HG)	58.3	63.6	59.1	63.2	70.7	75.0	65.5	71.4
No debt (ND)	59.4	64.5	55.0	61.4	66.8	77.2	61.8	66.8
Total	57.9	65.7	54.7	62.2	67.6	71.9	62.8	67.8

Table 7.5[3]: Mean assessment of the future share value of the reporting entities - pilot testing.

Reporting entity	Control	Unc.	A1	A2	A3	L1	L2	L3
	(n= 9)	*(n=11)*	*(n=11)*	*(n=11)*	*(n=14)*	*(n=9))*	*(n=11)*	*(n=14)*
High debt (HD)	482.0	572.1	670.3	535.7	412.0	682.4	450.0	564.6
Declining (DEC)	590.0	865.5	928.1	1031.4	492.2	702.2	591.8	1119.5
Stability (STA)	1213.6	1563.5	2131.2	1428.8	551.0	1227.1	1097.1	1422.9
High growth (HG)	846.2	992.6	954.6	885.6	567.6	949.0	751.7	1077.1
No debt (ND)	1344.6	1704.2	1489.6	1441.5	708.7	1536.6	1263.8	1491.1
Total	895.3	1139.6	1234.8	1064.6	546.3	1019..5	830.9	1135.0

[3] For key to table, see Footnote 1.

Table 7.6[4]: Mean expression of confidence in the assessment of the future share value of the reporting entities - pilot testing.

Reporting entity	Control	Unc.	A1	A2	A3	L1	L2	L3
	(n= 9)	*(n=11)*	*(n=11)*	*(n=11)*	*(n=14)*	*(n=9))*	*(n=11)*	*(n=14)*
High debt (HD)	61.2	59.0	57.9	53.0	54.1	67.8	45.9	64.1
Declining (DEC)	50.6	60.9	48.6	53.0	52.7	63.9	57.5	53.2
Stability (STA)	57.5	58.6	50.5	60.9	53.3	63.3	57.3	66.8
High growth (HG)	56.9	59.5	50.0	60.5	56.8	67.8	47.7	69.2
No debt (ND)	52.8	57.3	75.4	51.8	46.8	72.8	52.3	55.4
Total	55.8	59.1	56.5	55.8	52.7	67.1	52.1	61.7

It appeared from both the comments of the participants in the pilot-test and the results of the pilot-testing that the estimation of EPS caused some confusion, with a wide dispersion and no particular pattern to the estimates. Many participants enquired as to how the share price might be calculated. Others commented that in some instances (HD for example) they could not recommend buying a share. The estimation of share price will therefore be disregarded in the execution of the experiments.

The pilot-tests would appear to offer early, tentative foundations for the hypotheses outlined in chapter 6. In particular, it appears that the disclosure of uncertainty and the framing of such disclosure matters. The characteristics of the reporting entity also appears to effect both the perceptions of performance and position and the changes in those perceptions between the groups. Although no firm or statistical conclusions can be drawn from these tests due to their preliminary nature and the relatively small numbers involved, the results offer a basis for proceeeding with the experiments as outlined in section 7.4 and in subsequent chapters.

The comments of the group concerning the understandability of the information disclosed, the range of attributes of the five companies and the structure of the tasks were particularly encouraging. The participants in the pilot groups found the tasks manageable and understandable

[4] For key to table, see footnote 1.

although some commented that the time allowed (approximately 50 minutes) was limited. They found the rating scales used to express their assessments satisfactory.

The final design of the research instrument was carefully considered in the light of the comments obtained from the pilot and focus groups. In particular, the estimation of share value was disregarded. Moreover, the instructions were clarified following some misunderstanding among subjects in the pilot group.

The original instructions included definitions of reliability, performance and position drawn from the ASB's draft of the *Statement of Principles* that existed at the time of the pilot-testing (ASB, 1991a, 1992a and 1992b). Members of the pilot group commented that these definitions served to confuse rather than to clarify and that such concepts did not require clarification. No definitions of these concepts are given in the subsequent experiments which constitute this research. The focus group also identified a number of limitations of the research: for example, the limited disclosures, the absence of forward-looking information and other information which would assist them in assessing the performance and position of the reporting entities were specifically mentioned. These limitations are discussed in chapter 12.

The final research instrument is reproduced in the Appendix to this chapter.

7.4 THE EXECUTION OF THE EXPERIMENTS

As noted in chapter 5, there were 291 participants in the experiments. These comprised graduates of masters and undergraduate programmes in DCU over the previous 3 years and current students of the later years of such programmes. (Chapter 5 discussed in detail the benefits and limitations of availing of such participants.) 436 people (214 graduates, 93 final year undergraduate students and 129 post-graduate students of Dublin City University Business School ('DCUBS')) were contacted and invited to take part in the experiments. To maximise participation, the subjects were given a

choice of two times when they could take part in the experiment (Thursday evening or the following Saturday morning). The nature and purpose of the research was not disclosed.

The experiments took place in DCUBS on a Thursday evening and the following Saturday morning. Subsequent testing found no significant difference between the responses of the Thursday and Saturday participants. When the participants arrived at DCUBS, they were assigned to a location (i.e. classroom) in a predetermined random manner. Each location corresponded to a different experimental group. There was no contact between groups or subjects throughout the experiments. No time limit was given. The experiments took between forty-five and seventy-five minutes to complete.

8 female research post-graduate students in DCUBS acted as administrators of the experiments. None of these was from an accounting specialism. (As such, they were not in a position to assist the subjects except in accordance with their instructions.) An administrator was assigned to each group. Detailed instructions were given to each administrator in advance and the experimental procedure, though not its purpose, was discussed. Written instructions were given to each participant. These instructions were also read out by the administrator. No further information was given to the participants. Each subject was given a folder containing the part a) of the research instrument. To facilitate subsequent coding of the results, each folder and each element of the research instrument were marked with a letter (for the group) and a number (for the member of the group). Letters were assigned haphazardly to groups (for example, the first group was group C) so as to avoid potential demand effects by subjects' identification of their order in the process.

The research instrument, which is reproduced in the Appendix to this chapter, was in two parts. Part a) requested profiles of the participants including their age, experience, education and employment. It also comprised questions regarding their attitude and aptitude to accounting information. The questions concerning attitude to financial statement items solicit the views of the participants *vis-a-vis* the relaibility of trade debtors, prepayments, stock, the net book value of fixed assets, trade creditors and accruals. The questions regarding aptitude are drawn from (though not identical to) questions in Coyle (1990).The basis for this approach was discussed in section 5.4.1.

Once Part a) was completed, this element of the instrument was collected form the participants and then (and only then) Part b) was handed out.

Part b) comprised the financial statements of the five companies which the participants were asked to assess. The task involved was to assess the performance and position of the reporting entities on a bi-polar scale (0 equalling poor, 100 equalling excellent, the mid-point equalling average etc.). Subjects were also asked to express their confidence in their assessment also on a bi-polar scale (0 equalling not very confident, 100 equalling very confident etc.) The companies and the performance / positon task were assigned in a random order to avoid an ordering effect. Participants were asked to complete the second part of the research instrument first and to hand this to the administrators on completion. The means of the assessments of performance and position and of the expressions of confidence will be statistically compared by way of t-tests as discussed in Coolican (1994, p. 280) and Myers and Well (1991, Chapter 3).

Responses were anonymous. A small number of 'protocols' was collected from participants indicating their reaction to the experimental disclosures, their decision processes and their assessment of the realism of the information. Participants were also asked to indicate any views they had on the experimental process on the documentation provided. Most commented that the assignment was 'interesting' although several felt that the information given was insufficient for them to assess the performance and position of the companies adequately. This limitation was also identified during the pilot testing of the research instrument and is discussed in the final chapter. Specific comments by the participants on each of the disclosures will be discussed when exploring the implications of those disclosures.

7.5 CONCLUSION

This chapter has outlined the development of the research instrument used in the research. It explored the evolution of the experimental framework adopted amd the rationale for such a framework in the light of the diclosures suggested. The instrument was refined through a pilot-testing and brief focus group discussion. The execution and results of the pilot-testing wwas

discussed in some detail, including the main refinements to the research instrument which resulted. The implementation of the experiments was then discussed, including the profile of the participants.

To reiterate, the subjects are given the research instrument reproduced in the appendix to this chapter. The first part of the instrument gathers some information concerning the experience and background of the participants, their attitude towards elements of financial statements and their aptitude in the use of financial statements. In the second part, the subjects are presented with five reporting entities with differing characteristics (high debt, no debt, declining turnover growth, high turnover growth and stable growth). They are also presented with differing disclosures of uncertainty as outlined in section 7.2. They are asked to assess the performance and position of each of the reporting entities given the information available and, further, to express their confidence in those assessments of performance and position.

Having outlined the research method in chapter 5 and analysed the instrument with which such a method is implemented, the following chapters (chapters 8, 9 and 11) will explore the research disclosures and their results in more detail.

Appendix to Chapter 7

The Research Instrument

PART A

PART B

Note: The research instrument is outlined in sections here for ease of understanding. Each section has a brief introduction at the beginning. The experimental subjects received only the elements comprising the research intrument. The instrument was completed in two parts, part A and part B as outlined in section 7.4. The research instrument was pilot-tested as described in section 7.3.

1. Introduction and instructions

This element of the research instrument represents the instructions given to each subject at the outset of the experiments. These instructions were also read aloud by the administrator of the experimental group.

These instructions are discussed in section 7.4.

INTRODUCTION

This exercise comprises part of a project researching disclosure in a financial reporting context. Your responses will be anonymous and will be used entirely for the research. They will not be used for any other purpose. You are requested to fill in the details overleaf which are for statistical purposes only. Please do not sign your name on the response sheet.

You are asked to consider the tasks assigned carefully. Please do not communicate with others (other than administrator) during the exercise. Thank you for agreeing to participate.

Those participating fully in the research will be entered in a prize draw with prizes as follows: one £100 prize, three £50 prizes, eight £20 prizes and twenty £10 prizes.

During the exercise, you will not be given any more information other than the information contained in the documentation supplied.

INSTRUCTIONS

You will be given the financial statements of five companies. Each company has an issued share capital of 1,000,000 shares with a nominal value of £1 each,

All of the companies are involved in the manufacture and installation of high technology hardware and related software.

You are to assume that you are an investment analyst who has been approached by a client for advice regarding these companies.

The task assigned has two main sections. In Section A, you are asked to indicate your assessment of the reliability of several items that appear in financial statements and to answer a number of multiple choice questions.

When you have completed the tasks assigned in Section A, please indicate to the administrator who will collect your responses.

In Section B, you are asked to assess the financial performance and position of the companies whose financial statements are presented to you. In the context of each decision, you are asked to indicate your level of confidence in your assessment on a scale of 0 to 100.

When you have completed the tasks assigned in Section B, please indicate to the administrator who will collect your responses.

Your comments are welcome. Please write them on front page of Section B.

2. Summary information

Summary information of each participant was requested, including age, experience, education and employment. The summary information is used to develop a profile of participants discussed in chapters 6, 8, 9 and 10. In particular it is used to explore differences between experimental subjects in chapter 11.

SUMMARY INFORMATION

(This information is for statistical purposes only)

Age: (please tick) ≤20 _____ 21-25_____ 26-30_____
31-35_____ 36-40_____ >40 _____

Gender: (please circle) M F

Are you currently attending a course of study (please tick): Yes __ No __

*if yes, please indicate which course:*_____

if yes, please indicate how many years you have been attending the course: ____

Are you a graduate (please tick): Yes __ No __

if yes, please indicate which course(s) you are a graduate of:

_____

Are you a member of a professional body, e.g. IIMR, ICAI, CIMA (please tick):

Yes __ No __

if yes, please indicate which professional bodies you are a member of:

_____

_____

Are you currently employed (please tick): Yes __ No __

if yes, please indicate sector of employment:

'Big 6' accountancy firm __ Other accountancy firm __
Financial institution __ Manufacturing company __
Service company __
Other: (please specify)_____

*if yes, please indicate position:*_____

if yes, please indicate years in current employment: _____

if yes, does your employment require the use of financial statements:

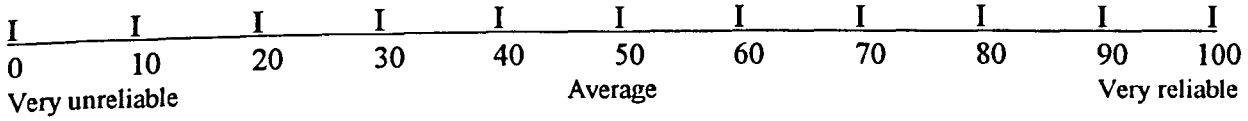
Yes ____ No ____

3. Perceptions of the reliability of financial statement items

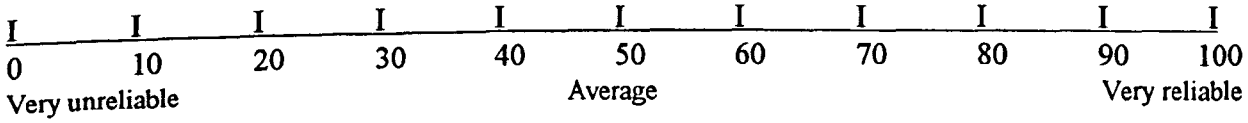
Participants are asked to indicate their perceptions of the reliability of selected financial statement items, in particular specific assets and liabilities. The rationale for the collection of such data is outlined in section 5.4.3 in the context of the characteristics of the experimental subjects. The development of this element of the research instrument is explored in section 7.4. The effect of the perceptions of the reliability of financial statement items on the assessments and confidence of the experimental subjects are discussed in sections 8.3.2 and 10.4.2.

Several items which normally appear in financial statements are given below. Please indicate your opinion of the reliability of these items.

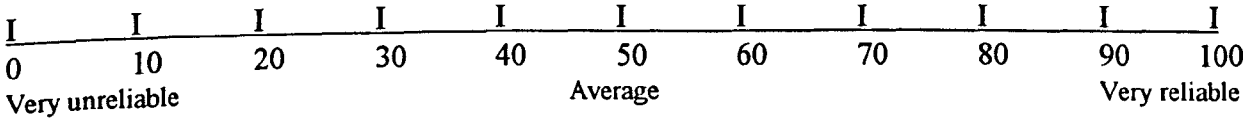
Accruals



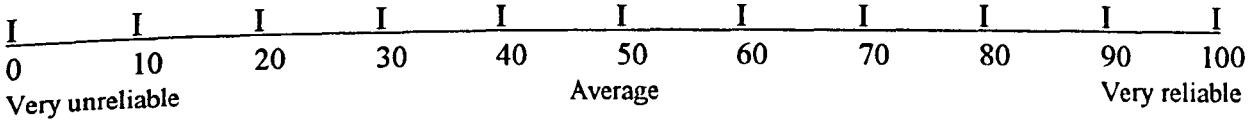
Trade debtors



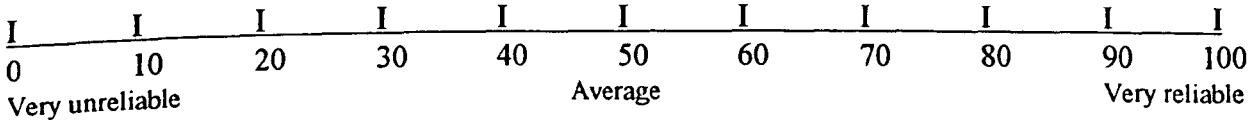
Trade creditors



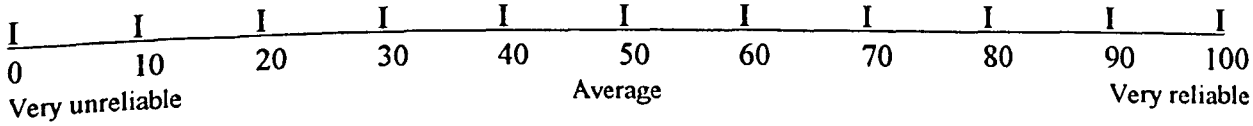
Prepayments



Stock



Net book value of tangible fixed assets



4. Aptitude test

The aptitude test comprises 5 multiple-choice questions developed as discussed in section 7.4. Section 5.4.1 outlined the rationale for this approach. The responses of those participants scoring less than 3 out of 5 are excluded from consideration in chapters 8, 9 and 10 while the effect of aptitude on perceptions is explored in section 11.3.2.

MULTIPLE CHOICE QUESTIONS

Please answer the following multiple choice questions. Choose the answer which is the most correct.

1. Meath plc had total assets of £40 million at 31 March 1994. During the year to 31 March 1995, the company

(i) made a profit after taxation of £3 million
(ii) raised capital of £1 million
(iii) paid a dividend of £1 million
(iv) revalued its freehold property upwards by £3 million.

What were the total assets of the company at 31 March 1995?

Please circle your choice:

A £45 million

B £48 million

C £46 million

D £43 million

E I have obtained a different answer to those above. My answer is _____

F I am unable to answer the question

2. A company's average debt collection period appears to have worsened from the previous year from 15 days to 25 days.

Which of the following is the best explanation of the deterioration in the debt collection period?

Please circle your choice:

A More customers this year than in the previous year

B More difficult trading conditions than in the previous year

C A reduction in the standard period of credit allowed to most customers

D A larger provision for doubtful debts than in the previous year

E I have obtained a different to those above. My answer is _____

F I am unable to answer the question

3. Extracts from the profit and loss account of Kildare plc for the year ended 31 December 1994 are as follows:

	1994 £000	1993 £000
Turnover	231	204
Gross profit	44	51
Distribution costs	13	14
Administrative expenses	15	16
Operating profit	13	21
Interest payable and similar charges	5	6
Profit on ordinary activities before taxation	8	15

Which one of the following conclusions is most likely based on the information given:

Please circle your choice:

A The company sold more goods by volume in 1994 than in 1993

B The gross profit margin was higher in 1994 than in 1993

C The change in distribution costs in 1994 over 1993 is due to higher sales turnover

D Operating profit as a percentage of sales fell in 1994 to about 1/3 of its 1993 level

E I have obtained a different to those above. My answer is _____

F I am unable to answer the question

4. Elements of the profit and loss account of Dublin plc are reproduced below:

	1994 £000	1993 £000
Turnover	6,029	5,706
Operating costs (Note 1)	5,386	5,100
Operating profit	658	606
Reorganisation costs	(25)	(9)
Profit on sale of property	37	14
Interest payable and similar charges	(95)	(120)
Profit on ordinary activities before tax	575	491

Note 1: Operating costs

Raw materials	2,540	2,523
Other expenses	1,896	1,672
Staff costs	883	866
Depreciation	125	126
Increase in stocks	(37)	(82)
Other operating income	(21)	(5)

Are the following conclusions reasonable based on the information given?

Conclusion 1
The improvement in net profit between 1993 and 1994 is mainly due to non-operational reasons.

Conclusion 2
The reduction between 1993 and 1994 in the ratio of staff costs to sales is due in large part to a reorganisation of operations.

Please circle your choice:

	Conclusion 1	Conclusion 2
A	Reasonable	Unreasonable
B	Reasonable	Reasonable
C	Unreasonable	Unreasonable
D	Unreasonable	Reasonable
E	I am unable to answer the question	

5. Extracts from the balance sheet of Cork plc are as follows:

	£000	£000
Current assets		
Stock	771	
Debtors	500	
Cash and bank	854	
		2,125
Creditors: amounts falling due within one year		
Bank overdaft and loans	702	
Other creditors	1,470	
		2,172
Net current liabilities		47

What is Cork plc's (1) current ratio and (2) quick ratio or acid test ratio?

Please circle your choice:

	Current ratio	Quick ratio
A	0.98	1.61
B	1.02	0.62
C	0.96	0.38
D	0.98	0.62

E I have obtained a different answer to those above. My answer is _____

F I am unable to answer the question

5. The financial statements

Five sets of financial statements (balance sheet and profit and loss account) were presented to the experimental subjects. The characteristics of the reporting entities represented in these financial statements are detailed in Figure 7.8. The effect of these characteristics on the perceptions of the experimental subjects are examined throughout chapters in chapters 8, 9 and 10.

Company: [No debt /ND
This label was not revealed
as part of the experiments]

PROFIT & LOSS ACCOUNT FOR THE YEAR ENDED 31 DECEMBER

	1993 £'000	*1994* £'000	***1995*** **£'000**
Turnover	10,858	11,752	**12,692**
Operating profit	2,794	2,993	**3,171**
Interest payable	0	0	**0**
Profit on ordinary activities before taxation	2,794	2,993	**3,171**
Taxation	616	678	**787**
Profit on ordinary activities after taxation	2,178	2,315	**2,384**
Dividends paid	100	120	**140**
Profit retained for year	2,078	2,195	**2,244**
Retained at beginning of year	4,087	6,165	**8,360**
Retained at end of year	6,165	8,360	**10,604**

BALANCE SHEET AT 31 DECEMBER

	1993 £'000	*1994* £'000	***1995*** **£'000**
Fixed assets	2,865	3,408	**3,934**
Current assets			
Stock	2,301	2,926	**3,273**
Debtors	2,347	2,908	**3,441**
Cash at bank and in hand	1,305	2,221	**2,923**
	5,953	8,055	**9,637**
Creditors < 1 year	1,653	2,103	**1,967**
Net current assets	4,300	5,952	**7,670**
Creditors > 1 year	0	0	**0**
	7,165	9,360	**11,604**
Capital and reserves			
Ordinary share capital	1,000	1,000	**1,000**
Profit and loss account	6,165	8,360	**10,604**
	7,165	9,360	**11,604**

Company: [Stable growth / STA This label was not revealed as part of the experiments]

PROFIT & LOSS ACCOUNT FOR THE YEAR ENDED 31 DECEMBER

	1993 £'000	*1994* £'000	***1995*** **£'000**
Turnover	11,548	11,656	**11,842**
Operating profit	2,656	2,681	**2,831**
Interest payable	283	271	**308**
Profit on ordinary activities before taxation	2,373	2,410	2,523
Taxation	293	217	**319**
Profit on ordinary activities after taxation	2,080	2,193	2,204
Dividends paid and proposed	55	55	**65**
Profit retained for year	2,025	2,138	**2,139**
Retained at beginning of year	2,963	4,988	**7,126**
Retained at end of year	4,988	7,126	**9,265**

BALANCE SHEET AT 31 DECEMBER

	1993 £'000	*1994* £'000	***1995*** **£'000**
Fixed assets	2,578	2,930	**3,202**
Current assets			
Stock	3,103	3,937	**5,264**
Debtors	2,837	3,653	**4,948**
Cash at bank and in hand	719	1,103	**1,609**
	6,659	8,693	**11,821**
Creditors < 1 year	2,358	2,681	**3,541**
Net current assets	4,301	6,012	**8,280**
Creditors > 1 year	891	816	**1,217**
	5,988	8,126	**10,265**
Capital and reserves			
Ordinary share capital	1,000	1,000	**1,000**
Profit and loss account	4,988	7,126	**9,265**
	5,988	8,126	**10,265**

Company:[Declining turnover / DEC This label was not revealed as part of the experiments]

PROFIT & LOSS ACCOUNT FOR THE YEAR ENDED 31 DECEMBER

	1993 £'000	*1994* £'000	***1995*** **£'000**
Turnover	11,084	10,308	**9,587**
Operating profit	2,788	2,093	**1,647**
Interest payable	219	223	**175**
Profit on ordinary activities before taxation	2,569	1,870	**1,472**
Taxation	477	420	**360**
Profit on ordinary activities after taxation	2,092	1,450	**1,112**
Dividends paid and proposed	150	200	**250**
Profit retained for year	1,942	1,250	**862**
Retained at beginning of year	1,397	3,339	**4,589**
Retained at end of year	3,339	4,589	**5,451**

BALANCE SHEET AT 31 DECEMBER

	1993 £'000	1994 £'000	1995 £'000
Fixed assets	2,836	2,789	**2,786**
Current assets			
Stock	2,593	3,003	**3,192**
Debtors	2,425	2,844	**2,910**
Cash at bank and in hand	258	145	**128**
	5,276	5,992	**6,230**
Creditors < 1 year	2,157	1,994	**2,074**
Net current assets	3,119	3,998	**4,156**
Creditors > 1 year	1,616	1,198	**491**
	4,339	5,589	**6,451**
Capital and reserves			
Ordinary share capital	1,000	1,000	**1,000**
Profit and loss account	3,339	4,589	**5,451**
	4,339	5,589	**6,451**

Company: [High debt / HD
This label was not revealed
as part of the experiments]

PROFIT & LOSS ACCOUNT FOR THE YEAR ENDED 31 DECEMBER

	1993 £'000	*1994* £'000	***1995*** **£'000**
Turnover	10,668	10,713	**10,852**
Operating profit	1,340	1,339	**1,356**
Interest payable	242	324	**327**
Profit on ordinary activities before taxation	1,098	1,015	**1,029**
Taxation	133	105	**110**
Profit on ordinary activities after taxation	965	910	**919**
Dividends paid and proposed	50	50	**50**
Profit retained for year	915	860	**869**
Retained at beginning of year	996	1,911	**2,771**
Retained at end of year	1,911	2,771	**3,640**

BALANCE SHEET AT 31 DECEMBER

	1993 £'000	*1994* £'000	*1995* £'000
Fixed assets	2,167	2,485	**2,674**
Current assets			
Stock	4,482	4,824	**5,199**
Debtors	3,248	3,638	**4,042**
Cash at bank and in hand	0	0	**0**
	7,730	8,462	**9,241**
Creditors < 1 year	5,238	5,373	**5,438**
Net current assets	2,492	3,089	**3,803**
Creditors > 1 year	1,748	1,803	**1,837**
	2,911	3,771	**4,640**
Capital and reserves			
Ordinary share capital	1,000	1,000	**1,000**
Profit and loss account	1,911	2,771	**3,640**
	2,911	3,771	**4,640**

Company:[High growth / HG
This label was not revealed
as part of the experiments]

PROFIT & LOSS ACCOUNT FOR THE YEAR ENDED 31 DECEMBER

	1993 £'000	*1994* £'000	***1995*** **£'000**
Turnover	4,452	8,932	**13,454**
Operating profit	672	1,924	**3,410**
Interest payable	193	360	**415**
Profit on ordinary activities before taxation	479	1,564	**2,995**
Taxation	168	563	**989**
Profit on ordinary activities after taxation	311	1,001	**2,006**
Dividends paid	0	50	**100**
Profit retained for year	311	951	**1,906**
Retained at beginning of year	507	818	**1,770**
Retained at end of year	818	1,770	**3,676**

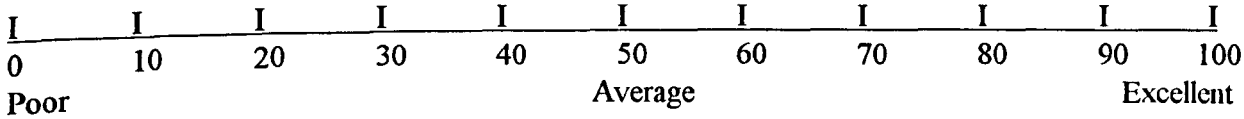
BALANCE SHEET AT 31 DECEMBER

	1993 £'000	*1994* £'000	*1995* £'000
Fixed assets	1,658	2,408	**3,534**
Current assets			
Stock	1,015	2,657	**3,591**
Debtors	927	2,084	**3,487**
Cash at bank and in hand	0	12	**89**
	1,942	4,753	**7,167**
Creditors < 1 year	846	2,150	**2,855**
Net current assets	1,096	2,603	**4,312**
Creditors > 1 year	936	2,241	**3,170**
	1,818	2,770	**4,676**
Capital and reserves			
Ordinary share capital	1,000	1,000	**1,000**
Profit and loss account	818	1,770	**3,676**
	1,818	2,770	**4,676**

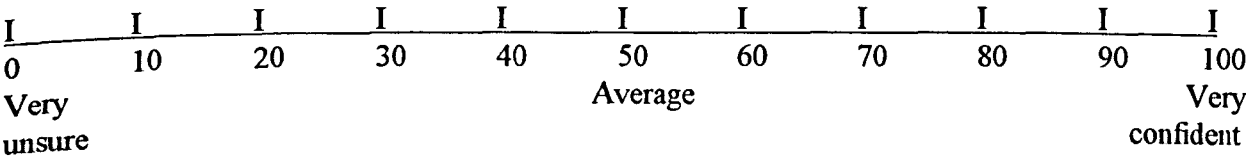
6. The experimental task

The development and testing of the experimental task is set out in sections 7.3 and 7.4. The experimental task for all groups was identical.

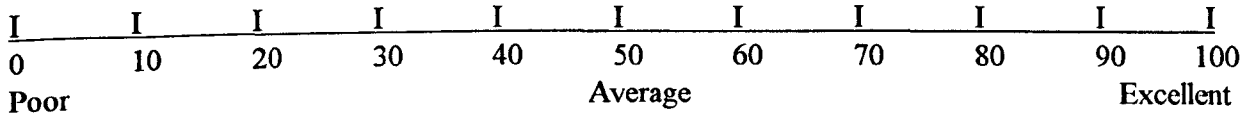
My assessment of the financial position of the company is (mark a point on the scale):



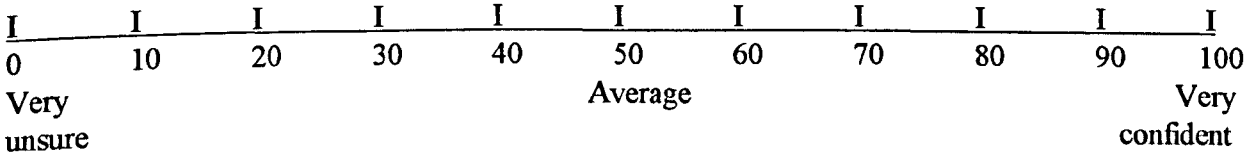
My level of confidence in this assessment is (mark a point on the scale):



My assessment of the performance of the company is (mark a point on the scale):



My level of confidence in this assessment is (mark a point on the scale):



7. Disclosures

The nature of the disclosures is driven by the research hypotheses developed in chapter 6. For illustrative purposes, the disclosure to Group 2 (the uncertain nature of financial statements) is reproduced here. The other 6 disclosures comprising the disclosures of the uncertain assets and liabilities are in Figures 7.2 to 7.7 inclusive. The control group receives no disclosure, only the balance sheet and profit and loss account of the reporting entities.

Disclosure to Group 2 (as in Figure 2.6)

Extract from the audited financial statements at 31 December 1995:

The preparation of financial statements in conformity with generally accepted accounting principles requires the Directors to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amount of revenues and expenses during the reporting period. Actual results could differ from those estimates.

CHAPTER 8

THE DISCLOSURE OF THE UNCERTAIN NATURE OF FINANCIAL STATEMENTS

8.1 INTRODUCTION

Disclosure concerning the uncertain nature of financial statements has been suggested by the *Statement of Position* of the Accounting Standards Executive Commitee ('AcSEC) of the AICPA (AcSEC, 1994). This disclosure is shown in Figure 2.6. This disclosure, argues the AsSEC (1994, p. 14), 'is intended to inform users of the inherent uncertainties in measuring' the various elements of financial statements and that the eventual crystallisation of these elements may differ from the original estimates of the directors. 'Such disclosure', it continues, 'alerts users that uncertainties are present in the financial statements of all reporting entities.'

Section 6.2 explored the research hypotheses in the context of the disclosure of the uncertain nature of financial statements in detail. An understanding of the arguments in favour of the disclosure of the uncertain nature of financial statements required, first, an exploration of the

objectives of financial statements: an understanding of their intended role and audience, their relationship with the world and their changing role. It is from such issues that a consideration of the need to disclose the uncertain nature of financial statements arose. At the heart of such disclosures are assumptions concerning the characteristics of the users of financial statements and their role in an uncertain world.

The hypotheses which were developed from such an exploration in Section 6.2 are as follows:

H1a: The disclosure of the uncertain nature of financial statements will influence the assessment of performance and position of reporting entities by the experimental subjects.

H1b: The disclosure of the uncertain nature of financial statements will influence the confidence of the experimental subjects in their assessment of the performance and position of the reporting entity.

H1c: User reaction to the disclosure of the uncertain nature of financial statements will be influenced by their expectations of the uncertain nature of financial statements.

H1d: The disclosure of the uncertain nature of financial statements will affect highly geared reporting entities to a greater extent than those which are not highly geared.

Having reiterated the hypotheses concerning such disclosures which were developed in chapter 6, this chapter discusses the research results regarding these hypotheses. Section 8.2 will examine the experimental results in the context of these disclosures and the hypotheses in question. Section 8.3 considers the implications of the research findings concerning the disclosure of the uncertain nature of financial statements. The concluding section, Section 8.4, summarises the chapter and its main conclusions.

8.2 EXPERIMENTAL RESULTS

The experimental approach has been discussed in detail in Chapter 5. In this section, the characteristics of the experimental subjects are described (in section 8.2.1). This is followed (in section 8.2.2) by a brief introduction of the experimental results. These results are then analysed in some detail in section 8.3 particularly in the light of the hypotheses outlined.

The statistical analysis of differences between the control group and the experimental group comprise parametric tests of the comparison of means of independent samples. These were performed after ensuring that the conditions for parametric tests were met as suggested by, for example, Coolican (1994, p. 280). The level of measurement is ordinal. It is assumed to be normally distributed (*n* approximating 30). Each group was also positively tested (at the 95% level of significance) for homogeneity of variance using Levene's test of equality of variance.

8.2.1 Description of the experimental subjects

74 participants were randomly assigned to two groups. The experimental conditions were as described in chapter 7. One group (the control group) received the profit and loss account and balance sheet of five reporting entities for three years in a random order. The second group (the experimental group) received the same financial statements in a random order, with the disclosure of the uncertain nature of financial statements as outlined in Figure 2.6.

Each group had 37 members. The average score of the subjects in the aptitude assessment described in chapter 4 was 3.05 out of 5, 3.19 out of 5 in the control group and 2.92 in the experimental group. 8 of those in the control group and 9 in the experimental group scored less than 3 out of 5. The experimental responses of these subjects will be excluded from further consideration. Furthermore, outlying responses will also be excluded, comprising one subject from the control group and two from the experimental group. (These responses were from subjects in employment who said they did not use financial statements as part of their employment.) This

leaves 28 subjects in the control group and 26 in the experimental group. Of the remaining subjects, the average score of each group in the aptitude assessment is 3.61 and 3.38 out of 5 respectively. (A statistical t-test for the comparison of means showed no significant difference in these means at a 95% level of significance.)

The average age of the members of the control group was 22.3 years while the average age of the experimental group was 23.1 years. The exclusion of those participants scoring less than 2 out of 5 in the aptitude assessment does not affect the average age of the participants. Those attending courses of study at Dublin City University Business School ('DCUBS') and who were not in employment were among those excluded on the basis of their score in the aptitude assessment to a greater extent than graduates of DCUBS (who would be in employment). Those in employment therefore fared better in the assessment of aptitude than those not in employment. This would appear to suggest that the aptitude assessment captured elements of the environment of employment of the participants to a greater extent than the classroom environment.

17 of the control group and 15 of the experimental group were in employment. The average time in employment in each group was 21 months. All of those in employment said they used financial statements as part of their employment. 11 members of each group were not in employment. 13 of the control group and 12 of the experimental group were attending a course of study in DCUBS. The control group comprised 8 males and 21 females while the experimental group included 18 males and 10 females. Tables 8.1 and 8.2 summarise the employment and course attendance respectively of the members of each group.

Table 8.1: Disclosure of the uncertain nature of financial statements: Employment of experimental subjects.

Employment category	Control Group	Experimental Group	Total
None	11	11	22
'Big 6' accountancy firm	5	1	6
Other accountancy firm	3	5	8
Financial institution	4	4	8
Manufacturing firm	3	2	5
Service firm	2	2	4
Other employment	1	3	4
TOTAL	29	28	57

Table 8.2: Disclosure of the uncertain nature of financial statements: Course attendance by the experimental subjects.

Course attendance	Control Group	Experimental Group	Total
None	13	12	25
BA in Accounting & Finance	7	5	12
MBS in Accounting	3	3	6
MSc in Investment & Treasury	2	6	8
MBA	4	2	6
TOTAL	29	28	57

8.2.2 Assessments of the reliability of financial statement items

As outlined in chapter 7, participants were asked to express their view of the reliability of various financial statement items. These comprised accruals, the net book value of fixed assets, prepayments, stock, trade creditors and trade debtors. The mean assessments of the reliability of each of these items by the control group and the experimental group is given in Table 8.3 including their significance at a 95% level in a t-test for the assessment of differences in means.

Table 8.3: Disclosure of the uncertain nature of financial statements: Mean assessment of the reliability of financial statement items

Financial statement item	Control group *(n=29)*	Rank*	Experimental group *(n=28)*	Rank*	t-value**
NBV of fixed assets	52.6	6	50.0	5	.1
Stock	65.0	4	45.7	6	14.8#
Trade debtors	79.1	1	73.6	1	1.3
Prepayments	70.9	3	60.0	3	4.9#
Accruals	59.8	5	55.0	4	.7
Trade creditors	74.0	2	66.1	2	2.0
Total	**66.9**		**58.7**		**4.8#**

* 1= most reliable, 6= least reliable
** t-test for comparision of means: # indicates significant at 95% level of significance.

The experimental group's assessment of the reliability of financial statement items was consistently lower than that of the control group. This difference is significant overall and in the case of stock and prepayments in particular. The ranking is broadly consistent between the items. There is an interesting pattern between those who were in employment / used financial statements and those who were not / did not use financial statements (Table 8.4). Those who were in employment in each group viewed liabilities (i.e. accruals and trade creditors) as less reliable and assets (i.e. the net book value of fixed assets, stock, trade debtors and prepayments) as more reliable than those who were not in employment. This issue, as well as gender differences in decisions, is discussed in detail in chapter 11.

Table 8.4: Disclosure of the uncertain nature of financial statements: Mean assessment of the reliability of financial statement items: those who were employed v. those who were not.

Financial statement item	Control group *(n=28)*				Experimental group *(n=26)*			
	Employed (n=17)		Not employed (n=11)		Employed (n=15)		Not employed (n=11)	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank
NBV of fixed assets	67.1	4	29.5	6	51.3	4	40.0	6
Stock	64.7	5	62.3	5	48.7	6	41.8	5
Trade debtors	81.8	1	77.7	1	75.3	1	67.3	1
Prepayments	70.6	3	69.5	3	58.0	3	56.4	3
Accruals	58.2	6	63.2	4	50.0	5	54.5	4
Trade creditors	72.4	2	76.8	2	61.3	2	67.3	1
Total	**69.1**		**63.2**		**57.4**		**54.6**	

* 1= most reliable, 6= least reliable

8.2.3 Assessments of the performance and position of the reporting entities

The assessments of performance and position by the two groups are given in Tables 8.5 and 8.6.

Table 8.5: Disclosure of the uncertain nature of financial statements: Mean assessment of the performance of the reporting entities

Reporting entity	Control group *(n=28)*	% change	Experimental group *(n=26)*	t-value*
High debt (HD)	45.0	-27%	33.1	3.86#
Declining (DEC)	44.5	-7%	41.3	0.72
Stability (STA)	61.8	-24%	46.9	3.3#
High growth (HG)	65.9	-16%	55.3	1.69~
No debt (ND)	66.2	+2%	67.3	0.22
Overall	**56.0**	**-10%**	**50.7**	

* t-test for comparison of means: # indicates significant at 95% level of significance, ~ indicates significant at 90% level of significance.

Table 8.6: Disclosure of the uncertain nature of financial statements: Mean assessment of the position of the reporting entities

Reporting entity	Control group *(n=29)*	% change	Experimental group *(n=28)*	t-value*
High debt (HD)	41.9	-14%	36.2	1.25
Declining (DEC)	42.7	-6%	40.0	0.78
Stability (STA)	63.9	-16%	53.8	2.45#
High growth (HG)	59.3	-11%	52.7	1.15
No debt (ND)	72.0	+4%	74.6	0.8
Overall	**55.5**	**-8%**	**51.0**	

* t-test for comparison of means: # indicates significant at 95% level of significance.

With one exception (the no debt company ND), the experimental group reached a lower assessment of the performances and positions of the reporting entities than the control group. This difference is significant at a 95% level of significance in the case of the performance and position of the stable company and the performance of the borrowing company. It is also significant at the 90% level of significance in the case of the performance of the high growth company. Overall, therefore, the difference in assessments between the control group and the experimental group is most significant in the context of performance.

Further exploration of these assessments between those who use financial statements as part of their employment ('Use FS') and those who do not use financial statements regularly ('Not use FS') is illustrated in Tables 8.7 and 8.8. With few exceptions, those who use financial statements

had a higher opinion of the reporting entities than those who do not. This is particularly so in the case of performance. Furthermore, the effect of the disclosure of the uncertain nature of financial statements is particularly marked among those who use financial statements. That effect is also more marked in their assessment of performance.

Table 8.7: Disclosure of the uncertain nature of financial statements: Mean assessment of the performance of the reporting entities - those who use financial statements v. those who do not.

Reporting entity	Control group (n=28)		Experimental group (n=26)	
	Use FS (n= 17)	Not use FS (n=11)	Use FS (n=15)	Not use FS (n=11)
High debt(HD)	43.5	47.3	30.7	36.3
Declining (DEC)	39.4	52.3	36.7	48.9
Stability (STA)	60.0	64.5	44.7	50.0
High growth (HG)	61.7	72.3	52.7	59.1
No debt (ND)	69.4	61.4	62.0	74.5
Overall	**54.8**	**59.6**	**45.4**	**53.8**

Table 8.8: Disclosure of the uncertain nature of financial statements: Mean assessment of the position of the reporting entities - those who use financial statements v. those who do not.

Reporting entity	Control group (n=28)		Experimental group (n=26)	
	Use FS (n= 17)	Not use FS (n=11)	Use FS (n=15)	Not use FS (n=11)
High debt (HD)	37.1	50.0	35.3	37.2
Declining (DEC)	41.7	44.1	40.0	40.0
Stability (STA)	63.5	64.5	51.3	57.3
High growth (HG)	66.5	48.2	53.3	51.8
No debt (ND)	69.4	75.9	72.7	77.3
Overall	**55.6**	**56.5**	**50.5**	**52.7**

Table 8.9 illustrates the degree of consensus in the assessments of performance and position as measured by the variance of such assessments. The disclosure of the uncertain nature of financial statement appeared to have no significant effect on the dispersion of assessments.

Table 8.9: Disclosure of the uncertain nature of financial statements: Variances of the assessment of performance and position.

Reporting entity	Control group *(n=28)* Variance of assessment of		Experimental group *(n=26)* Variance of assessment of	
	Performance	Position	Performance	Position
High debt (HD)	10.5	19.4	12.2	13.1
Declining (DEC)	17.0	13.7	13.9	11.0
Stability (STA)	17.9	13.5	14.9	16.0
High growth (HG)	22.0	24.1	23.6	17.5
No debt (ND)	29.3	12.5	16.5	13.0
Mean variance	**19.3**	**16.6**	**16.2**	**14.1**

8.2.4 Expression of confidence in assessments of performance and position

As outlined in chapter 7, subjects were also asked to indicate their confidence in their own assessment of the performance and position of the reporting entities. The results of these assessments of confidence are given in Table 8.10. They are further analysed in Table 8.11 between those who use financial statements as part of their employment and those who do not or are not employed.

Table 8.10: Disclosure of the uncertain nature of financial statements: Mean expression of confidence in the assessment of performance and position of the reporting entities.

Reporting entity	Control group *(n=28)* Confidence in		Experimental group *(n=26)* Confidence in	
	Performance	Position	Performance	Position
High debt (HD)	65.7	71.1	63.4	64.3
Declining (DEC)	65.2	65.5	61.5	63.8
Stability (STA)	63.2	64.3	60.0	65.0
High growth (HG)	68.6	66.8	64.6	62.7
No debt (ND)	68.4	69.1	65.4	67.3
Overall	**66.2**	**67.4**	**63.0**	**64.6**

Table 8.11: Disclosure of the uncertain nature of financial statements: Mean expression of confidence of the assessment of the performance and position of the reporting entities: those who use financial statements v. those who do not.

Reporting entity	Control group (n=28)				Experimental group (n=26)			
	Confidence in				Confidence in			
	Performance		Position		Performance		Position	
	Use FS (n=17)	Not use FS (n=11)	Use FS (n=17)	Not use FS (n=11)	Use FS (n=15)	Not use FS (n=11)	Use FS (n=15)	Not use FS (n=11)
High debt (HD)	65.9	65.4	68.2	75.5	66.7	59.1	68.0	59.1
Declining (DEC)	61.8	70.4	64.1	67.7	66.0	55.5	65.3	61.8
Stability (STA)	60.0	68.2	62.4	67.3	64.0	54.5	66.0	63.6
High growth (HG)	66.5	71.8	63.5	71.8	67.3	60.9	65.3	59.1
No debt (ND)	67.1	70.4	62.3	79.5	66.7	63.6	68.0	66.4
Overall	**64.3**	**69.2**	**64.1**	**72.4**	**66.1**	**58.7**	**66.5**	**62.0**

The disclosure of the uncertain nature of financial statements did not appear to affect the confidence of subjects in their assessment of the performance and position of the reporting entities. Neither did that confidence vary significantly between the reporting entities. However, there were marked differences between expressions of confidence of those who were in employement (all of whom use financial statements as part their employment) and those who do not. The expressions of confidence of those who did not use financial statements appeared to be consistently and markedly affected by the disclosure of the uncertain nature of financial statements.

8.3 EXPLORATION OF THE RESEARCH FINDINGS

8.3.1 Test of Hypothesis H1a and Hypothesis H1b

Hypothesis **H1a** proposed that the disclosure of the uncertain nature of financial statements would influence perceptions of the performance and position of the reporting entities. The experimental group's mean assessment of position and performance of the reporting entities was lower than that of the control group. In several instances, this difference was significant. This difference was most marked in the context of performance. It was also most marked among those who use financial statements as part of their employment. Hypothesis **H1a** is, therefore, supported by the experimental findings.

Chen (1974) and Chen and Summers (1981) disclosed probabilistic accounting data (not in the structure of financial statements) with no indication of probabilities associated with the reported figures to a group of experimental subjects. They reported no effect on the decisions of subjects when the non-deterministic nature of accounting numbers was reported: 'a mere indication of the uncertain nature of the reported figues did not provide subjects as much information as the conventional single-value accounting figures' (Chen, 1974, p. 165). Chen did, however, note that the confidence of subjects in their decision was adversely affected by the disclosure of uncertainty attached to accounting numbers. 'This suggests', agrues Chen (1974, p. 195), 'that subjects want accountants to tell them either the best estimate they can develop or the range of possible variations, with confidence levels on the reported ranges'.

Birnberg and Slevin (1976, p. 154) suggest that non-reaction to such information (as noted by Chen (1974) but not in this research) may result from three factors: first, that the data is irrelevent to the potential decision-maker's model, secondly, that the decision maker's lack of experience meant that s/he was unable to use the information and, thirdly, uncertainty was consistent with prior expectations. The latter two reasons suggested by Birnberg and Slevin lead one to consider the experience of the experimental subjects as that experience may fashion both their ability to use financial statement and their prior expectations. Perhaps ironically, differences between the groups were most marked among those who use financial statements. These differences, and potential explanations of such differences, are explored in the discussion of the Hypothesis **H1b** below. Prior expectations of the reliability of financial statements were specifically measured prior to the experimental task. Differences based on such prior expectations are considered in detail in section 8.2.3.

Hypothesis **H1b** proposed that the disclosure of the uncertain nature of financial statements would affect the confidence expressed by the experimental subjects in their assessments of the reporting entities. There were no significant differences in each group's expression of confidence in their assessment of performance and position. To this extent, Hypothesis **H1b** is unsupported.

However, there was a marked difference between the expressions of confidence of those who use financial statements and those who do not. The effect of the disclosure on the expressed confidence of those using financial statements was mixed and unaffected overall while the expressed confidence of those who do not use financial statements was markedly and consistently lower among the experimental group than among the control group.

Therefore, there were differences between the assessments of performance and position of the control group and the experimental group. Particularly marked were differences in the assessment of those among the experimental subjects who use financial statements as part of their employment than those who do not (i.e. those not in employment). On the other hand, the expressed confidence of those who do not use financial statements was affected to a greater extent than is the expressed confidence of those who do.

These findings may appear to conflict: if subjects' assessments were reduced by their view of the uncertain nature of financial statements, perhaps their confidence should also be affected. However, it appears that an awareness of the uncertain nature of financial statements affects assessment and / or confidence. In other words, it is possible that having scaled down their assessment of the performance and position of the reporting entities concerned, subjects are then quite confident of their view. Alternatively, if assessment of performance and position had not been affected, perhaps subjects would then be less confident of their unadjusted assessments. Furthermore, it would appear reasonable that those who were in employment (and use financial statements) would have more confidence in their ability to include within their consideration the uncertain nature of financial statements. Their familiarity with financial statements may have led them to have confidence in their own ability to adjust for the disclosure of their uncertain nature. Thus supports the view of Einhorn and Hogarth (1978, p. 402) that 'confidence in judgment is built up slowly with experience'.

Differences in assessments and expressions of confidence in those assessments were particularly marked in the context of performance. Performance may be more sensitive to uncertain estimates

than position. Performance is a function of the opening and closing balance sheet. Hicks' (1961) definition of profit, for example, is that it is a product of 'well-offness' at the beginning and end of the period. *Ceteris paribus*, profit represents the increase in net assets over a period: $P / L_1 = BS_1 - BS_0$. Hence uncertain estimates may affect performance (which is a function of current and past position) to a greater extent than they affect current position.

These differences between the control group and the experimental group's reaction may be due to a number of factors. First, it may be that those involved in the experiment were unaware of the fact or the implications of the uncertain nature of financial statements. Hence, the views of the Ryan Commission, the AICPA and others who advocated the disclosure, *inter alia*, that financial statements are a function of the estimates of management may be supported. It may also support the findings of Bailey, Rylinski and Shields (1983) that proposed wording changes to the audit report altered the perceptions of financial statements by users of those financial statements. Bailey (1981, p. 890) also 'conjectured' that Chartered Financial Analysts were unclear as to the source of audited financial statements (being 'predisposed to regard the auditor as the source').

Second, the disclosure may be seen as a 'surprise' thereby heightening their view of its significance. This unfamiliarity is mentioned by Bailey (1981) as a possible explanation of his finding that financial analysts did not differ in their reaction to audited and unaudited financial statements. Those who do not use financial statements may be less familiar with their regular contents and, thus, the disclosure of their uncertain nature may cause them less surprise.

The disclosure in question was, however, closely modelled on elements of the Directors' Responsibility Statement which is are regularly disclosed within the annual reports of publicly quoted companies in Ireland. Hence, this disclosure, although differing in its current form, is not a radical departure in reporting practice. It may not in itself be a cause of significant surprise as a result.

Thirdly, expectations of uncertainty differ between those who use financial statements and those who do not. Generally, the control group and the experimental group had differing views

concerning the reliability of certain financial statement items. The experimental group consistently indicated that they viewed certain financial statement items as less reliable than did the control group. The research findings indicate that the experimental group had a lower assessment of the performance and position of the reporting entities than the control group. To control for the effect of such expectations of reliability, a partial correlation was carried out, controlling for total reliability. Significant correlation remained between the assessments of the reporting entities as outlined in Tables 8.6 and 8.9 (i.e. in the context of the STA and the performance of HD). Hence, the differences in the assessments between the groups did not appear to be affected by their expectations of the reliability of the financial statement items.

The role of these expectations on forming perceptions was the focus of H1c.

8.3.2 Test of Hypothesis H1c

The literature discussed in the early part of this chapter suggests that prior expectations form subsequent assessments. Puto (1987), for example, found that buying decisions are driven, *inter alia*, by initial expectations and by the 'message' received by the decision maker. Others, such as Einhorn and Hogarth (1985) and Helson (1964), suggest that decision makers draw from prior experience and other stimuli to create an 'anchor', an 'adaptation level' from which decisions are changes or adjustments. Such research indicates that where decision-makers are coming from informs the decision(s) at which they arrive.

The initial assessment of the reliability of financial statement items attempts to capture the attitudes of the experimental subjects to these financial statement items. These attitudes give an indication of the subjects' awareness of the uncertain nature of financial statements prior to the disclosure of that uncertainty. Hypothesis **H1c** accordingly proposed that the assessment of the reporting entities' performance and position may be formed both by the initial attitude of the experimental subjects to financial statement information **and** by the disclosure of the uncertain nature of such information.

In order to assess the correlation of original perceptions of the reliability of financial statement items and the subjects' assessment of the performance and position of the reporting entity, a test suggested by Sherif and Hovland (1961, p. 150) who classified attitudes expressed on a bi-polar scale into various 'positions' was performed. Overall assessments of the reliability of financial statement items were classified into three 'positions' or categories. (This overall assessment ('total reliability') was reached by calculating the mean of the separate assessments of the reliability of the six financial statement items in question.)

Table 8.12: Disclosure of the uncertain nature of financial statements: Mean assessments and confidence classified by perception of the reliability of financial statements.

Group[a]	Reliability category[b]	Assessment of position	Assessment of performance	Confidence in assessment of position	Confidence in assessment of performance
1	A (n=12)	56.5	55.5	68.5	69.7
	B (n=11)	53.6	55.3	61.5	57.8
	C (n=5)	59.0	62.4	77.6	76.4
2	A (n=3)	53.9	57.6	66.7	62.7
	B (n=18)	51.7	48.4	63.9	62.6
	C (n=5)	49.2	46.0	66.0	64.4

[a] Group 1 received no disclosure, while group received the disclosure of the uncertain nature of financial statements.
[b] 'A' expressed the relative perception (between 69 and 100) that financial statements were reliable, 'B' that financial statements were neither reliable nor unreliable (between 56 and 68),, 'C' that financial statements were relatively unreliable (0-55).

Mean total reliability for all the subjects included in the experiments was 61.94 and the standard deviation was 12.73. The mean total reliability was taken as the centre-point of the assessments. The middle category was then established as the mean plus / minus half of the standard deviation of the mean: the middle category therefore ranged from 55.575 (or 56) to 68.305 (or 68). The categories of total reliability therefore comprised 0 to 55 (category C, being those who perceive financial statements as least reliable), 56 to 68 (category B or middle category) and 69 to 100 (category A, or those who perceive financial statements as most reliable). An independent t-test for was then performed to test the significance of the differences in means between each category of total reliability of the assessments of the performance and position of the reporting entities. Table 8.12 summarises the assessments of each category of reliability within groups 1 and 2.

Two interesting trends may be observed from these results. These trends should be treated cautiously as the relatively small numbers involved in categories A and C render statistical tests of significance weak. First, those who perceived financial statements as relatively less reliable expressed greater confidence in their subsequent assessments using these financial statements than those who perceived financial statements as relatively more reliable. This difference *within* groups between experimental subjects with differing characteristics suggests that differences in perceptions of financial statement items (specifically stock and accruals) does fashion perceptions regarding the disclosure of the uncertain nature of such items.

Secondly, the most significant change *between* groups appears to be between those with less confidence in the reliability of financial statements. This is not a common trend between the other categories. It would appear, therefore, that the disclosure of the uncertain nature of financial statements undermined the confidence and assessment of performance and position of those whose initial perceptions were that financial statements were not reliable. The disclosure therefore confirmed these expectations. They did not, however, appear to alter the expectations of those who perceived financial statements as relatively more reliable (i.e. categories A and B). Therefore, mindful of the *caveat* regarding the relatively small numbers involved, Hypothesis **H1c** is supported particularly in the case of those whose initial expectation of the reliability of financial statements is relatively low.

8.3.3 Test of Hypothesis H1d

It is hypothesised in hypothesis **H1d** that the disclosure of the uncertain nature of financial statements would affect highly geared reporting entities more than those which are not highly geared. The mean assessments of the performance and position of the reporting entities (including their ranking) is presented in Tables 8.4 and 8.5 respectively. The characteristics of the companies are debt (high debt HD / no debt ND), turnover (growth HG / decline DEC) and stability (STA). The subjects in both groups ranked ND as the best company from the point of view of both

performance and position and HD as the lowest with respect to position. The lowest performance varied between DEC (by the control group) and HD (by the experimental group). This would appear to suggest not only that debt is perceived as a more important indicator of position than high growth or stability but also as an important indicator of performance.

The company portraying stability (STA) is ranked third in performance and second in position. This would appear not to support the proposals by, for example Ronen and Sadan (1981) and Dye (1988) that smoothing of financial ratios is optimal as 'smoothing' reduces the volatility of ratios and noise in financial information. Particularly in the context of performance, HG displays dramatic and, perhaps, erratic growth but is perceived as having a stronger performance than STA.

Significant changes between the two groups occurred in the context of the performance of HD and STA (at a 95% level of significance) and HG (at a 90% level of significance). There was also a significant difference (at the 95% level of significance) between both groups' assessment of the position of STA. This consistent caution concerning STA may indicate a particular view of financial statements portraying stability in the light of a signal of the uncertain nature of financial statements. This disclosure may have been interpreted as a signal from management cautioning the reader of the financial statements. This signal may have been perceived as particularly significant where reporting entities portrayed high levels of particular characteristics (growth or debt) or stability. This may result from Braun *et al.*'s (1995) view that the assessment of performance and position is partly a function of volatility. The uncertain nature of the information may increase the volatility of HG and HD and undermine the stability of STA. Although debt appears to be an important indicator of position and performance, such varied results do not support **H1d**.

8.4 CONCLUSION

This chapter examined in some detail the results of the disclosure of the uncertain nature of financial statements. This disclosure was examined particularly in the context of the objectives of financial statements. These objectives are to give the users of financial statements information that is useful in making investment decisions. It was argued that information concerning the uncertain

nature of financial statements informs expectations of the information used in decision models. Initial expectations of such information may play a role in the reaction to such disclosures.

The research findings show that the assessments of the control group and the experimental group differed. There was evidence therefore to support Hypothesis **H1a**. Further consideration would appear to suggest that, in particular, the assessments of performance and position of those who use financial statements were affected by the disclosure of the uncertain nature of financial statements while that disclosure affected the confidence of those not using financial statements. Overall confidence was not affected by the experimental disclosure. Such varied findings did not support Hypothesis **H1b**.

The experimental group initially expressed the view that financial statement items were less reliable than did the control group. These assessments were divided into three categories (category A perceiving financial statements to be relatively more reliable, category C perceiving financial statements to be relatively less reliable and category B in between the two.) Significant differences in the reaction to the experimental disclosure emerged between those who perceived financial statements to be less reliable. The assessments of this category of subject were markedly lower between the control group and the experimental group. The assessments and confidence of the other categories were relatively consistent. Hence, Hypothesis **H1c** was supported in the case of those who found financial statements less reliable.

Hypothesis **H1d** proposed that the effect of the disclosure would vary between companies. Generally, the effect of the disclosure did vary across companies, being particularly marked in the companies showing high level of growth and debt and a high level of stability. This may suggest that the disclosure of the uncertain nature of financial statements tended to accentuate volatility and undermine stability. Further, it appears that disclosures should not be driven by a view of materiality which focusses on the item alone. Materiality also has a context and that context should include, perhaps, the characteristics of the reporting entity.

CHAPTER 9

DISCLOSURE OF RANGES OF UNCERTAINTY IN THE DOMAIN OF ASSETS

9.1 INTRODUCTION

Chapter 2 outlined the various and varied suggestions for dealing with uncertainty concerning specific elements of financial statements. Such suggestions have evolved over a number of decades: several have been adopted by standard-setters and can be found within current or proposed accounting standards. Chapter 5 drew on a number of these suggestions to develop a pragmatic framework within which uncertainty might be disclosed in financial statements. Chapter 6 then established a number of hypotheses arising from these disclosures in the case of both assets and liabilities.

This chapter examines the effects of these disclosures of uncertain assets on the perceptions and confidence of the experimental subjects. The following chapter (chapter 10) then examines the effect of these disclosures in the context of liabilities and also differences between disclosures of uncertainty in the domains of assets and liabilities. Chapter 10 includes a discussion of the role of

perceptions of the reliability of assets and liabilities in forming the assessments of the experimental subjects.

The hypotheses examined in this chapter were developed in Section 6.3 and are set out in Table 6.1 of chapter 6. They are also summarised as they are considered in turn in sections 9.2.3 to 9.2.5 of this chapter. These hypotheses draw in particular on the discussion in chapters 3 and 6 concerning the need for inference in the light of incomplete or ambiguous information. More specifically, the research reported in this chapter examines the impact of the disclosure in financial statements of more complete or less ambiguous regarding stock on decision-making in an uncertain context.

The layout of the chapter is as follows: Section 9.2 outlines the characteristics of the experimental subjects (in section 9.2.1), outlines the research results (in section 9.2.2) and then (in sections 9.2.3 to 9.2.5) explores the results of the research in the context of the hypotheses set out. The chapter concludes with a discussion of the main implications of these findings in Section 9.4.

9.2 EXPERIMENTAL RESULTS

9.2.1 Description of the experimental groups

There were 4 experimental groups in the context of these hypotheses, the control group (who received the 5 sets of financial statements and no disclosure) and 3 others. These 3 others were in the domain of assets. (Further disclosures in the domain of liabilities are discussed in chapter 8.) In all 3 of these cases, the maximum exposure was disclosed as £900,000. Group A1 received the disclosure of the remote possibility of a remote event which may cause an inestimable decrease in assets. Group A2 received a disclosure quantifying the remote probability as between 5% and 8%. In all other respects, the disclosure was identical to the disclosure to group A1. Group A3 received a disclosure quantifying the inestimable outcome as between 35% and 65% of the

maximum exposure. In all other respects, the disclosure was identical to the disclosure to group A2.

Group A1 comprised 36 subjects, group A2 38 and group A3 36. As was outlined in chapters 5 and 6, the experimental subjects were given an aptitude test in advance of their participation in the experiments. Those who scored less than 3 out of 5 (or 60%) were excluded from further consideration in the context of this chapter. This resulted in usable experimental results for 29 subjects in group A1, 32 in group A2 and 26 in group A3.

The average age in group A1 was 24.7 years, 24.9 years in group A2 and 23.8 years in group A3. The average score in the aptitude test was 3.5, 3.5 and 3.8 respectively. Course attendance in each group is shown in Table 9.1. Table 9.2 shows the employment and the use of financial statements of the members of each group.

Table 9.1: Disclosure of an uncertain asset: Course attendance of experimental subjects.

Course	LEVEL OF DISCLOSURE[1]			
	Control Group	A1	A2	A3
NONE	13	10	10	9
BA in Accounting & Finance	7	10	8	8
MBS in Accounting	3	3	5	2
MSc in Investment & Treasury	2	4	6	4
MBA	4	2	3	3
Total	29	29	32	26

1 **Control group**: profit and loss account and balance sheet with no disclosure.
A1: profit and loss account and balance sheet with the disclosure of the remote possibility of a remote event which may cause an inestimable decrease in stock with a maximium exposure of £900,000 as in Figure 7.2.
A2: as A1, quantifying the remote probability as between 5% and 8% as in Figure 7.4.
A3: as A2, quantifying the inestimable outcome as between 35% and 65% of the maximum exposure as in Figure 7.6

Table 9.2: Disclosure of an uncertain asset: Employment and use of financial statements of the experimental subjects.

		LEVEL OF DISCLOSURE[2]		
	Control Group	A1	A2	A3
Not in employment	11	17	13	10
Use financial statements	17	7	12	16
Do not use financial statements	1	5	7	-

17 (12) members of group A1 were male (female), 21 (11) members of group A2 were male (female) while 12 (14) of group A3 were male (female). Differences between male and female responses are discussed in chapter11.

9.2.2 Discussion of experimental results

The experimental results are set out in Tables 9.3, 9.4, 9.5, and 9.6.

Table 9.3: Disclosure of an uncertain asset: Mean assessment of the position of the reporting entities

Reporting entity	Control group[2] *(n=29)*		Group A1[2] *(n=29)*		Group A2[2] *(n=32)*		Group A3[2] *(n=26)*
		% change		%change		%change	
High debt (HD)	41.9	+8%	45.3	-14%	39.1	+21%@	47.4
Declining (DEC)	42.7	+40%@	59.8	-22%@	46.5	-5%	44.3
Stability (STA)	63.9	-2%	62.4	-12%@	54.8	-2%	53.7
High growth (HG)	59.3	-15%	50.7	+8%	54.8	+12%	61.5
No debt (ND)	72.0	-----	72.1	-1%	71.2	+2%	72.5
Overall	**55.5**	**+5%**	**58.1**	**-8%**	**53.3**	**+5%**	**55.9**

@= significant at 95% level of confidence.

Table 9.4: Disclosure of an uncertain asset: Mean assessment of the performance of the reporting entities

Reporting entity	Control group[2] *(n=29)*		Group A1[2] *(n=29)*		Group A2[2] *(n=32)*		Group A3[2] *(n=26)*
		% change		% change		% change	
High debt (HD)	45.0	+6%	47.5	-13%	41.5	+8%	44.7
Declining (DEC)	44.5	+25%@	55.4	-30%@	38.7	+1%	39.2
Stability (STA)	61.8	-12%	54.5	+4%	56.8	-9%	51.5
High growth (HG)	65.9	-10%	59.5	-	59.2	+6%	62.8
No debt (ND)	66.2	-2%	64.6	+5%	67.7	-5%	64.5
Overall	**56.0**	**-**	**56.3**	**-6%**	**52.8**	**-**	**52.5**

@= significant at 95% level of confidence.

[2] For key to the level of disclosure, see footnote 1. As the disclosure evolves from the control group to A1 to A2 to A3, the % change likewise measures change from the control group to A1 to A2 to A3.

Table 9.5: Disclosure of an uncertain asset: Mean expression of confidence in the assessment of the position of the reporting entities.

Reporting entity	Control group[3] (n=29)		Group A1[3] (n=29)		Group A2[3] (n=32)		Group A3[3] (n=26)
		% change		% change		% change	
High debt (HD)	71.1	-5%	67.4	-8%	62.3	-	62.0
Declining (DEC)	65.5	+3%	67.2	-6%	63.2	-1%	62.5
Stability (STA)	64.3	+2%	65.9	-5%	62.4	+2%	63.9
High growth (HG)	68.6	-2%	67.1	-5%	63.7	+1%	64.6
No debt (ND)	68.4	-	68.8	+1%	69.1	-2%	67.7
Overall	**66.2**	**+2%**	**67.3**	**-5%**	**64.1**	-	**64.1**

Table 9.6: Disclosure of an uncertain asset: Mean expression of confidence in the assessment of the performance of the reporting entities.

Reporting entity	Control group[3] (n=29)		Group A1[3] (n=29)		Group A2[3] (n=32)		Group A3[3] (n=26)
		% change		% change		% change	
High debt (HD)	65.7	-5%	62.5	+2%	63.5	-	63.3
Declining (DEC)	65.2	-	65.2	-7%	60.5	+5%	63.7
Stability (STA)	63.2	-	63.7	-2%	62.3	+7%	66.8
High growth (HG)	68.6	-4%	66.1	-15%@	56.3	+13%#	63.7
No debt (ND)	68.4	-	68.0	-4%	65.6	+5%	68.8
Overall	**66.2**	**-2%**	**65.1**	**-5%**	**61.6**	**+6%**	**65.2**

@ = significant at 95% level of confidence.
 # = significant at 90% level of confidence.

9.2.3 Test of Hypothesis H2a and Hypothesis H2b

Hypothesis **H2a** proposed that the disclosure of a decrease in an asset where the probability of occurrence of the decrease is remote and where the outcome of the decrease is inestimable would affect the assessment of the performance and position of the reporting entities by the experimental subjects. Hypothesis **H2b** proposed that such disclosures would affect the confidence of subjects in their assessment.

[3] For key to the level of disclosure, see footnote 1. As the disclosure evolves from the control group to A1 to A2 to A3, the % change likewise measures change from the control group to A1 to A2 to A3.

Tables 9.3 and 9.4 set out the mean assessment of the the control group and the groups which received the disclosure of the remote, inestimable event affecting stock (Group A1). Tables 9.4 and 9.5 set out the mean expression of confidence of each of the experimental groups. There was no significant or consistent difference between the confidence of the control group and group A1. Hypothesis **H2b** is therefore unsupported.

With regard to hypothesis **H2a**, there was no readily apparent common trend in the effect of disclosure A1 on the assessment of position or performance. Examining Tables 9.3 and 9.4 in more detail, however, it may be observed that the disclosure had a positive effect (significant in the case of the company with declining turnover) on the reporting entities with a weaker position and performance (i.e. HD and DEC) and a negative effect (though not significant) in the case of the reporting entities with a stronger position and performance (i.e HG and ND). Hence the disclosure was perceived as good news in the case of the weaker reporting entities and bad news in the case of the stronger ones. This finding is consistent with the findings of Danos *et. al.* (1989) who found differing patterns of decision-making behaviour when confronted with differing reporting entities.

Furthermore, the experimental subjects may have been concerned about the potential for stock obsolescence in the light of the declining sales of DEC before the disclosure in question. The disclosure may have alleviated these concerns. (Further evidence for such a conclusion is found in the comparison of the disclosure of liabilities in chapter 10.) These conflicting effects result in no significant overall effect on assessments by the disclosure of A1.

The lack of significance (except in the case of DEC discussed below) of the disclosure regarding the possibility of a remote, inestimable loss (whether a decrease in assets or an increase in liabilities) may be due to the registering of a remote event as highly unlikely, as an event that need not be considered in the assessment of performance and position. Alternatively, as Birnberg and Slevin (1976, p. 154) suggest, perhaps the disclosure was 'consistent with the subject's prior assessment . . . and therefore provided no new data (information) to the subject'. In this instance, the remote loss is not seen as bad news of a significance requiring attention.

It does, however, appear to have a significant positive effect in the case of DEC. The disclosure of the possibility of a remote event increasing the liabilities of such a company may in fact mitigate the perceived risk of the company, which may have been seen as susceptible to stock obsolescence in the volatile environment of high technology companies. The perceived risk relating to such obsolescence may have been limited by the disclosure that any loss arising had a maximum potential of £900,000 and that the probability of the crystallisation of obsolescence was remote. Such considerations may not have been as vivid in the case of the other reporting entities whose growth was relatively stable.

In summary, the hypotheses that the disclosure of the existence of a remote loss whose outcome cannot be estimated would affect the assessment (**H2a**) and / or confidence (**H2b**) is not supported in the overall context. This would appear to suggest that events to which the word remote are attached or whose outcome cannot be estimated are disregarded in the consideration of the performance and position of reporting entities. Furthermore, this initial disclosure would appear to support the current view within accounting standards (e.g. SSAP 18) that remote events need not be disclosed.

However, the disclosure had differing effects on assessments between the reporting entities. Where the reporting entities were perceived as having a relatively strong position and performance, the disclosure had a negative though not significant effect. The disclosure had a positive effect in the case of the reporting entities which were initially perceived as having a relatively poor performance and position. The disclosure, therefore, appeared to reassure in the case of poor perceptions and, paradoxically, to undermine perceptions of good performance.

The following hypotheses explored further the apparent expectations of the experimental subjects concerning remote and (separately) inestimable events.

9.2.4 Test of Hypothesis H2c and Hypothesis H2d

Hypotheses **H2c** and **H2d** suggested that the disclosure of a range of probability for a remote event leading to an inestimable loss (decrease in an asset) would affect the assessments of subjects and their confidence in their assessment. The range of probability which was disclosed for the remote event was 5% to 8%. Tables 9.3 and 9.4 present the experimental results relating group A2 (the group receiving the disclosure of the range of probability of the occurrence of the remote event in the domain of assets).

There was a marked difference (decrease) in the assessments of position of Group A2 relative to groups A1 (which received a disclosure of a remote probability of loss). This decrease was significant at a 95% level of confidence in the case of the performance and position of the declining reporting entity (DEC) and in the case of the position of the stable reporting entity (STA). Similarly overall confidence decreased, significantly in the case of the assessment of the high growth company (HG).

These results would appear to suggest, in the broad context, that the quantification of remote as a range of 5% to 8% rather than simply as the word 'remote' undermines subjects' perception of the performance and position of some of the reporting entities whose financial statements were presented in the experiments. Groups A1 and A2 appear to have inferred that remote probability represented a probability less than 5% to 8%. Hence the disclosure that management estimated the 'remote' probability as representing a range of 5% to 8% was 'bad news'.

This seems to be particularly so in the case of the DEC and STA. In the case of DEC, not only does the mean assessment of the company decrease but Group A2 also ranked this company lower (4th in position and 5th in performance) than did Group A1 (3rd in both position and performance). This restores the ranking of the position of the reporting entities by the control group.

There is a significant (at a 95% level of confidence) decrease (12%) in the mean assessment of the position of STA. This decrease is driven primarily by those within group A2 who use financial statements as part of their employment. Tables 9.7 and 9.8 present the mean assessments of performance and position of those who use financial statements compared to those who do not. The assessment of the position of STA is relatively constant between Group A1 and those who do not use financial statements in Group A2. However, there is a decrease of 21% between those who use financial statements in group A2 and those who do not.

This significant difference exists in the case of STA although there is little difference overall between the assessments of those who use financial statements and those who do not. It would appear that more experienced subjects in particular hold a different view of remote and, furthermore, that this differing view undermined their view of STA in particular. This may be as a result of a more cautious view of stable performance and position on the part of the more experienced subjects. These subjects may either have held the view that the disclosure in question suggested smoothing of performance and / or position in the case of the stable company or that it undermined its stability in the most current year. This has echoes of the results in chapter 8, where the disclosure of the uncertain nature of financial statements undermined views of the stable company and appeared to raise questions of entities with smooth (or smoothed?) income and balance sheet growth.

Table 9.7: Disclosure of an uncertain asset: Assessment of the position of the reporting entities: those who use financial statements v. those who do not.

Reporting entity	Group A1[4]			Group A2[4]			Group A3[4]		
	Use FS *(n=7)*	<%>	Not use FS *(n=22)*	Use FS *(n=12)*	<%>	Not use FS *(n=20)*	Use FS *(n=10)*	<%>	Not use FS *(n=16)*
HD	42.9	+7%	46.1	38.7	+2%	39.3	51.0	-18%	41.7
DEC	59.3	+1%	60.0	44.6	+7%	47.6	42.6	+11%	47.2
STA	62.7	-2%	61.4	48.3	+21%	58.6	52.8	+4%	55.0
HG	55.0	-10%	49.3	55.0	—	54.6	61.9	-1%	61.0
ND	74.3	-4%	71.4	72.9	-4%	70.2	72.4	—	72.8
Total	**58.8**	**-2%**	**57.6**	**51.9**	**+4%**	**54.1**	**56.1**	**-1%**	**55.5**

4 For key to levels of disclosure, see footnote 1.

Table 9.8: Disclosure of an uncertain asset: Assessment of the performance of the reporting entities: those who use financial statements v. those who do not.

Reporting entity	Group A1[5]			Group A2[5]			Group A3[5]		
	Use FS *(n=7)*	<%>	Not use FS *(n=22)*	Use FS *(n=12)*	*(n=20)* <%>	Not use FS *(n=10)*	Use FS *(n=16)*	<%>	Not use FS
HD	42.9	+14%	49.0	42.9	-5%	40.6	48.5	-26%	35.7
DEC	46.7	+24%	58.0	39.2	-2%	38.5	38.0	+8%	41.1
STA	52.9	+4%	55.0	57.9	-3%	56.2	51.8	-2%	50.9
HG	67.1	-15%	56.9	58.3	+2%	59.7	62.6	+1%	63.2
ND	69.6	-9%	63.1	66.2	+3%	68.5	64.3	—	64.7
Total	**55.8**	**+1%**	**56.4**	**52.9**	—	**52.7**	**53.0**	**-4%**	**51.1**

Overall, it appears therefore that the quantification of 'remote' had a particular effect in the case of companies whose turnover growth was either stable or declining (in the instance of the asset disclosure). This is somewhat similar to the findings in chapter 8 that the disclosure of the uncertain nature of financial statements affected the high growth reporting entity (HG) more significantly than other entities. The entities with high debt or no debt were unaffected by these disclosures. Their position would appear to be more clear-cut to the experimental subjects as they were ranked as being in the best and worst respectively. This is consistent with the findings of Danos *et. al.* (1989, p. 244) who found that 'the perceived risk level of the borrower had a significant impact on how subsequent information was subsequently used'.

The disclosure of a range of probability of remote events affects the assessment of performance and position by the experimental subjects. Furthermore, the findings of Hypothesis **H1d** in chapter 8 regarding the importance of the characteristics of the reporting entities would appear to be echoed in these disclosures also. The disclosure would appear to undermine stability and accentuate volatility. In this case, however, volatility includes decline. Those entities with clear characteristics of high debt or no debt appear relatively unaffected.

[5] For key to the levels of disclosure, see footnote 1.

9.2.4 Test of Hypothesis H2e and Hypothesis H2f

Hyotheses **H2e** and **H2f** proposed that the disclosure of a range of outcomes of an event whose outcome is inestimable would affect assessments of the reporting entities and confidence in those assessments. The mean assessments of Group A3 are presented in Tables 9.3 and 9.4. These groups were given the financial statements of the five reporting entities along with the disclosure of the estimated range of outcomes of the decrease (increase) in assets (liabilities) respectively which had a probability of occurrence of between 5% and 8%. In other words, the additional disclosure to this group comprised the estimated range of outcomes. In all other respects, the disclosures were similar to the disclosures to Groups A2.

Overall there was little difference between the assessments of A2 and A3. In the case of the high debt entity (HD), the increase in Group A3's mean assessment of position relative to Group A2 was significant at a 95% level of confidence. There was also a marked but not significant increase in the assessment of the position of the high growth company (HG). Otherwise the mean assessments of groups A2 and A3 were broadly similar.

The effect of the disclosure of the range of outcomes was therefore confined to companies with specific characteristics of high growth or high debt. It may be noted from an examination of the research instrument in chapter 7 that HG is also characterised by high debt, although this debt level is mitigated and supported by turnover and asset growth. Chapter 10 (section 10.3.3) discusses this ambiguity further in the context of liabilities.

The assessments of Group A3, however, being broadly similar to those of Group A2 with the additional clarification of the 'inestimable' outcome, appeared therefore to be driven by the disclosure to A2 (of the range of probability of a remote event) rather than the disclosure of the range of outcomes of that remote event. This implies that the effect of the disclosure of the range of probability of a remote event carried through to the assessments of Group A3 as there was a significant difference between the mean assessments of Group A3 and A1 but not between A3 and A2.

There appeared to be no significant difference between the assessment of position of those who use financial statements in Groups A3 and those who do not (Tables 9.7 and 9.8). In the context of the performance of the reporting entities, however, those who use financial statements assessed the performances of HD, DEC and STA as significantly lower than those who do not use financial statements, while they assessed the performances of HG and ND as significantly higher. Overall, however, there was no marked difference in the assessment of performance of both groups. Any differences between them were confined to differences between their assessments of the reporting entities rather than overall differences resulting from the disclosure of the range of outcomes. Those who use financial statements attached more importance to growth and decline of turnover in assessing performance than those who did not use financial statements.

It would appear, given such varied results, that Hypotheses **H2e** and **H2f** are unsupported. The most marked differences in the mean assessments of the experimental subjects appear to arise from the disclosure of the range of probability of a remote event rather than the range of outcomes of the event. The implications of such a finding are two-fold. First, it seems that the range of outcomes disclosed (35% - 65%) did not add to or alter the impression of inestimability attached to the disclosure given. It seems that it fitted within the understanding of inestimability of the experimental subjects or at least did not upset that understanding.

Secondly, the more concrete effect seems to have arisen from the clarification of the remote probability of loss. This confirms the findings noted in the context of the disclosure of the range of probability of the remote loss (decrease in assets). Furthermore, the findings suggest that the experimental subjects focussed to a more significant extent on the probability of occurrence than its outcome. This may be as a result of the disclosure of a maximum potential loss. Hence, even if the loss was inestimable, even if it transpired to be the maximum loss, that maximum loss was nevertheless restricted to £900,000. Outcome in the disclosure to Groups A1 was therefore curtailed. It was also perhaps more concrete, more 'crisp' (Larsson and Chesley, 1986) than the somewhat more nebulous, vague (Budescu and Wallsten, 1985) concept of 'remote'.

9.2.5 Test of Hypothesis H2g and Hypothesis H2h

Hypotheses **H2g** and **H2h** in Table 6.2 deal with the intersubjective understanding of the concepts included in the disclosures in question. Hypotheses **H2g** and **H2h** proposed that the disclosure of information concerning the range of probability of a remote event and the range of outcomes among inestimable outcomes would lead to greater consensus among the experimental subjects. These propositions were based on the notion that greater consensus or unanimity would arise out of increased information concerning concepts such as 'remote' and 'inestimable'. Hence, the clarification of the directors' understanding of remote and inestimable would lead to a more shared understanding of such disclosures (after, for example, the illustration in Figure 6.2)).

Tables 9.9 and 9.10 present the standard deviations of the experimental subjects' assessments of the performance and position of the reporting entities.

Table 9.9[6]: Disclosure of an uncertain asset: Standard deviations of the assessment(s) of the position of the reporting entities

Reporting entity	Control group *(n=29)*	Group A1 *(n=29)*	Group A2 *(n=32)*	Group A3 *(n=26)*
High debt (HD)	19.4	18.2	11.6	18.9
Declining (DEC)	13.7	12.6	15.5	16.6
Stability (STA)	13.5	14.5	14.4	10.8
High growth (HG)	24.1	18.2	16.9	18.0
No debt (ND)	12.5	12.0	14.6	13.3
Mean Standard Deviation	**16.8**	**15.1**	**14.6**	**15.5**

Table 9.10[6]: Disclosure of an uncertain asset: Standard deviations of the assessment(s) of the performance of the reporting entities

Reporting entity	Control group *(n=28)*	Group A1 *(n=29)*	Group A2 *(n=32)*	Group A3 *(n=26)*
High debt (HD)	10.5	15.5	12.7	17.6
Declining (DEC)	17.0	18.4	14.9	14.1
Stability (STA)	17.9	22.2	16.2	10.9
High growth (HG)	22.0	20.7	16.9	18.2
No debt (ND)	29.3	14.3	12.7	22.4
Mean Standard Deviation	**17.7**	**18.2**	**14.7**	**16.6**

[6] For key to disclosures, see footnote 1.

Standard deviation is used as a measure of consensus. As pointed out by Coolican (1994, p. 228), standard deviation is a useful measure of dispersion. The results in Tables 9.9 and 9.10 illustrate that once more the most marked changes in the standard deviation of the subjects's assessments of both performance and position occurred with respect to Group A2 (decreased standard deviation). This suggests that the disclosure of the range of probabilities of the remote event strengthened the shared understanding of Group A2. Such differences between reactions in the domains of assets and liabilities are discussed in chapter 10.

Exploring the impact of the disclosures in a general sense, the effects on the standard deviation of the assessments of the experimental groups appears to confirm the earlier findings in this chapter that the disclosure of the range of probability of a remote event (disclosed to Groups A2) was more influential than the other disclosures. It served also to strengthen consensus. It would appear therefore that not alone did the experimental subjects have a lower definition of remote than 5% to 8%. The definition or clarification of remote, as hypothesised, led to a stronger consensus and shared view of the position and performance of the reporting entities. As outlined in chapter 5 earlier, the expectation would be that a range of 5% to 8% would lead to a firmer 'intersubjective reality' than the vaguer adjective 'remote'. The research results support this expectation.

Hence in those instances where disclosures had an effect on the assessments of the experimental subjects, they also seemed to have an effect on the consensus of subjects. Hypotheses **H2g** and **H2h** are supported to that extent. Such effects on consensus are however less marked and less consistent when examined for each reporting entity. The pattern of consensus does not follow to any significant extent the pattern of assessment with respect to DEC and STA. In fact, there is no discernible or consistent pattern of consensus in the individual entity context.

9.3 CONCLUSION

This chapter set out to explore some proposed disclosures of uncertainty. Chapter 5 introduced some of the origins of such disclosures. In particular, more recent suggestions by the ASB and the CICA were identified as forming a basis for disclosure in instances of uncertainty. These disclosures clarified the remote, inestimable nature of uncertain events where the recognition or disclosure of point estimates would potentially portray a misleadingly certain view of such estimates.

Research hypotheses were then developed in chapter 6. These hypotheses drew on the notion that disclosures more vivid and crisp than concepts such as 'remote' and 'inestimable' would affect the assessment of those involved in the experiments constructed. It was also proposed that the confidence of the experimental subjects in their assessment would also be affected. Furthermore, it was hypothesised that such disclosures would lead to a more shared view of the world, a firmer intersubjective reality. Such an intersubjective reality would result from a narrower variation of assessments of performance and position about the mean.

As outlined in chapter 7, experimental subjects were randomly assigned to seven groups. A between-subjects experimental design was used to disclose the remote probability of an uncertain event with an inestimable outcome. The Directors' estimates of the remote probability (between 5% and 8%) and the range of outcomes of the event (between 35% and 65% subject to a maximum of £900,000) were then disclosed in a controlled manner.

The research found that the clarification of the remote nature of an uncertain event leading to a loss (Group A2) did affect the experimental subjects' assessments in the domain of assets. Hypotheses **H2c** and **H2d** were therefore supported. This disclosure also affected the consensus among experimental subjects regarding the performance and position of the reporting entities, supporting hypotheses **H2g** and **H2h**. On the other hand, the disclosure that there was simply a remote probability of loss and that this loss was inestimable did not appear to affect the assessments of the experimental subjects. Likewise, subjects' assessments did not appear to be affected by the

disclosure of the estimated range of outcomes. Therefore, hypotheses **H2a**, **H2b**, **H2e** and **H2f** were unsupported although in the case of **H2a** and **H2b** the effect differed between reporting entities.

The research firstly indicates that the experimental subjects were more concerned with the occurrence of the event than with its outcome. This may be partly due to the limitation or 'capping' of the outcome at £900,000. (The outcome was 'capped' for the reasons outlined in chapter 5.) Secondly, it also indicates that subjects' impressions of remote differed from the disclosure of remote as between 5% and 8%. Clearly, a shared view of the word 'remote' does not exist or at least the clarification of remote as a probability of 5% to 8% altered the perception of the experimental subjects. This would suggest that the initial view of remote did not accord with a probability of 5% to 8%. This has implications for the notion of remote events promulgated, for example, by the CICA. (As outlined in Figure 7.1, an exposure draft by the CICA proposes that remote events should comprise those with a probability of occurrence of less than 15% .)

Such differing views of the meaning of 'remote' may lead to the non-disclosure by management of potential events or outcomes (as required by SSAP 18) which would not necessarily be viewed by others as remote and would therefore be usefully disclosed or recognised. Improved communication would require directors to disclose ranges of probability of uncertain events in order to allow users to incorporate such events, if necessary, into their assessment of the performance and position of the reporting entity. In practice, this could be limited by introducing restrictions on the incidence of disclosure as suggested by FRS 7 (when there is a high level of uncertainty regarding occurrence and outcome) or the CICA's ED on *Contingencies* (when the consequences could be catastrophic).

CHAPTER 10

DISCLOSURE OF RANGES OF UNCERTAINTY IN THE DOMAIN OF LIABILITIES

10.1 INTRODUCTION

Chapter 9 explored the research results in the context of the disclosure of assets, having drawn on the discussion in chapter 2 of the various suggestions for dealing with uncertainty concerning specific elements of financial statements. This chapter examines the results of these disclosures for liabilities.

As outlined in chapters 2 and 7, changes in assets and liabilities are treated asymmetrically in financial accounting. The constraints of prudence dictate that 'a degree of caution' be included 'in the exercise

of the judgements needed in making the estimates required under conditions of uncertainty, such that income or assets are not overstated and expenses or liabilities are not understated'. (ASB, 1995b, p. 46) One of the objectives of this research is to assess reactions to the disclosure of uncertain assets and liabilities within this asymmetric paradigm. This chapter explores the experimental results in this context.

Section 10.2 restates the research hypotheses particular to the exploration of the reaction of the experimental subjects to the disclosures in the domain of liabilities. This restatement is relatively brief as it concerns hypotheses developed in chapter 6 and based on the exploration of the thesis in earlier chapters (chapters 2, 3 and 8 in particular). The section then outlines the experimental results.

Section 10.3 discusses these results in the light of the hypotheses concerning the disclosure of an uncertain liability. The differences between the results concerning the disclosures in the area of liabilities and the disclosure of assets (analysed in chapter 8) are also explored in section 10.4. The role of expectations in forming the assessments of subjects will also be discussed. The final, concluding section (Section 10.5) explores some of the implications of the research findings.

10.2 RESEARCH HYPOTHESES AND EXPERIMENTAL RESULTS

The theories of decision-making and confidence formation underlying the research hypotheses were outlined in chapter 3. Drawing on this research, the research hypotheses addressed in this chapter were developed in chapter 6 and outlined in Table 6.2 of that chapter. These hypotheses are also restated briefly as they are considered in turn in this chapter.

There were 4 experimental groups in the context of these hypotheses, the control group (who received the 5 sets of financial statements and no disclosure) and 3 others who received the disclosures outlined in chapters 5 and 7. These disclosures concerned liabilities in this instance. In all of these 6 cases, the

maximum exposure was disclosed as £900,000. Group L1 received the disclosure of the remote possibility of a remote event which may cause an inestimable increase in liabilities. Group L2 received a disclosure quantifying the remote probability as between 5% and 8%. In all other respects, the disclosure was identical to the disclosure to groups A1 (in chapter 7) and L1. Group L3 received a disclosure quantifying the inestimable outcome as between 35% and 65% of the maximum exposure. In all other respects, the disclosure was identical to the disclosure to groups A2 (in chapter 7) and L2.

10.2.1 Description of experimental subjects

Group L1 contained 35 subjects, group L2 36 and group L3 36. As was outlined in chapters 5 and 6, the experimental subjects were given an aptitude test in advance of their participation in the experiments. Those who scored less than 3 out of 5 (or 60%) were excluded from further consideration in the context of this chapter. This left usable experimental results of 21 subjects in group L1, 29 in group L2 and 21 in group L3.

The average age in group L1 was 21.8 years, 22.1 years in group L2 and 26.1 years in group A3. The average score in the aptitude test was 3.6, 3.8 and 3.8 respectively. Course attendance in each group is shown in Table 10.1. Table 10.2 shows the employment and the use of financial statements of the members of each group.

Table 10.1: Disclosure of an uncertain liability: Course attendance of experimental subjects.

Course	LEVEL OF DISCLOSURE[1]			
	Control Group	L1	L2	L3
NONE	13	9	11	11
BA in Accounting & Finance	7	6	10	4
MBS in Accounting	3	2	3	4
MSc in Investment & Treasury	2	3	3	2
MBA	4	1	2	-
Total	29	21	29	21

Table 10.2: Disclosure of an uncertain liability: Employment and use of financial statements of the experimental subjects

	LEVEL OF DISCLOSURE[1]			
	Control Group	L1	L2	L3
Not in employment	11	10	13	6
Use financial statements	17	9	12	10
Do not use financial statements	1	2	4	5

8 (13) members of group L1 were male (female), 24 (5) members of group L2 were male (female) while 17 (4) of group L3 were male (female). Differences between male and female responses are discussed in chapter 11.

[1] **Control group**: profit and loss account and balance sheet with no disclosure.
L1: profit and loss account and balance sheet with the disclosure of the remote possibility of a remote event which may cause an inestimable increase in a guarantee with a maximium exposure of £900,000 as in Figure 7.3.
L2: as L1, quantifying the remote probability as between 5% and 8% as in Figure 7.5.
L3: as L2, quantifying the inestimable outcome as between 35% and 65% of the maximum exposure as in Figure 7.7.

10.2.2 Outline of experimental results

The experimental results are set out in Tables 10.3, 10.4, 10.5 and 10.6.

Table 10.3: Disclosure of an uncertain liability: Mean assessment of the position of the reporting entities

Reporting entity	Control group[2] (n=29)		L1[2] (n=21)		L2[2] (n=29)		L3[2] (n=21)
		% change		% change		% change	
High debt (HD)	41.4	—	41.0	+12%	45.9	-29%@	32.5
Declining (DEC)	42.9	+4%	44.8	+15%	51.4	+5%	53.8
Stability (STA)	63.8	+4%	66.4	-4%	63.5	+3%	65.7
High growth (HG)	57.6	+17%	67.4	-23%@	51.6	+16%	60.0
No debt (ND)	71.9	+2%	73.3	-2%	71.9	+15%#	82.4
Overall	**55.5**	**+10%**	**60.9**	**-9%**	**55.4**	**+8%**	**59.9**

@ = significant at a 90% level of confidence.
#= significant at 90% level of confidence.

Table 10.4: Disclosure of an uncertain liability: Mean assessment of the performance of the reporting entities

Reporting entity	Control group[2] (n=29)		L1[2] (n=21)		L2[2] n=29)		L3[2] (n=21)
		% change		% change		% change	
High debt (HD)	43.8	+9%	47.9	-2%	46.9	-8%	43.3
Declining (DEC)	44.3	+4%	46.0	-3%	44.8	+1%	45.2
Stability (STA)	62.1	+12%	69.8	-14%#	60.2	+8%	65.2
High growth (HG)	65.0	+7%	69.3	-14%#	59.7	+19%#	71.0
No debt (ND)	65.0	+10%	71.7	-9%	65.3	+14%#	74.7
Overall	**56.0**	**+5%**	**58.6**	**-3%**	**56.9**	**+4%**	**58.9**

 # = significant at 90% level of confidence.

Table 10.5: Disclosure of an uncertain liability: Expression of confidence in the assessment of the position of the reporting entities

Reporting entity	Control group[2] (n=29)		L1[2] (n=21)		L2[2] (n=29)		L3[2] (n=21)
		% change		% change		% change	
High debt (HD)	71.0	-4%	68.3	-9%	62.4	+6%	66.2
Declining (DEC)	65.7	-2%	64.5	-6%	60.7	+12%	68.1
Stability (STA)	63.8	+9%	69.8	-8%	64.1	+14%#	73.3
High growth (HG)	67.2	-2%	65.7	—	65.9	+5%	69.0
No debt (ND)	69.2	—	68.8	-7%	63.8	+28%@	81.4
Overall	**67.4**	**—**	**67.4**	**-6%**	**63.4**	**+13%**	**71.6**

 # = significant at 90% level of confidence.
@ = significant at 95% level of confidence.

[2] For key to disclosures, see footnote 1. As the disclosures evolve from the control group to L1 to L2 to L3, the % change likewise measures change from the control group to L1 to L2 to L3.

Table 10.6: Disclosure of an uncertain liability: Expression of confidence in the assessment of the performance of the reporting entities

Reporting entity	Control group[3] (n=29)	% change	L1[3] (n=21)	% change	L2[3] (n=29)	% change	L3[3] (n=21)
High debt (HD)	66.2	—	66.2	-10%	59.3	+11%	65.7
Declining (DEC)	65.0	+13%	73.3	-17%#	60.8	+12%	68.1
Stability (STA)	63.1	+8%	67.9	-10%	61.0	+17%@	71.4
High growth (HG)	68.3	+1%	69.3	-11%	61.4	+17%@	71.9
No debt (ND)	68.4	+3%	70.7	-8%	64.8	+15%#	74.3
Overall	**66.3**	**-2%**	**65.1**	**-5%**	**61.6**	**+6%**	**65.2**

 # = significant at 90% level of confidence.
@ = significant at 95% level of confidence.

10.3 THE EFFECT OF THE DISCLOSURE OF UNCERTAIN LIABILITIES

10.3.1 Test of Hypothesis H3a and Hypothesis H3b

Hypothesis **H3a** proposed that the disclosure of an increase in a liability where the probability of occurrence of the increase is remote and where the outcome of the increase is inestimable would affect perceptions of the performance and position of the reporting entities. Hypothesis **H3b** proposed that such disclosures would affect the confidence of subjects in their assessment.

Tables 10.3 and 10.4 set out the mean assessment of position and performance respectively of the the control group and the group which received the disclosure of the remote, inestimable event affecting accruals (Group L1). Tables 10.5 and 10.6 set out the mean expression of confidence in those assessments of each of the experimental groups. There was no significant difference between the confidence of the control group and group L1. Hypothesis **H3b** is therefore unsupported The lack of effect of the dislcosure L1 is consistent with the absence of effect in the case of A1 (discussed in chapter 9). Hypothesis **H2b** (relating to a similar disclosure regarding assets) was also unsupported.

[3] For key to disclosures, see footnote 1. As the disclosures evolve from the control group to L1 to L2 to L3, the % change likewise measures change from the control group to L1 to L2 to L3.

There was no significant difference between the assessment of performance of the control group and group L1. There was however a more marked difference between the assessment of position of the control group and group L1. Group L1 gave a higher assessment of the position and performance of the reporting entities as a whole than did the control group. The disclosure to group L1 therefore appeared to be 'good news'. The difference in the assessment of position was primarily due to the higher assessment of the position of the HG. (This difference was significant at an 85% level of confidence.)

The lack of significance (except in the case of HG discussed below) of the disclosure regarding the possibility of a remote, inestimable loss is similar to that in the domain of assets identified in chapter 9. Similarly, this lack of significance may be due to the registering of a remote event as highly unlikely, as an event that need not be considered in the assessment of performance and position (whether in the context of assets or liabilities). In this instance, the remote loss is not seen as bad news of a significance requiring attention.

It does, however, appear to have a (positive) effect in the case of the HG. The high growth company experienced a growth rate of approximately 75% on average during the previous 3 years. High growth is identified by Beaver *et al.* (1975) as being potentially high risk. This would particularly be the case in the high technology sector (Lev and Thiagarajan, 1992). One of the risks attached to such companies is the danger of overtrading, reflecting on their position more than on performance. It should also be noted (as outlined in chapter 7) that the high growth company also has a relatively high level of debt (although this is mitigated by growth in underlying assets and turnover). Hence, the position of such a company, in particular, may be the subject of concern in the technology sector. (The high growth company is ranked 3rd in position but joint first in performance by the control group.)

The disclosure of the possibility of a remote event increasing the liabilities of such a company may in fact mitigate the perceived risk of the high growth company, which may have been seen as susceptible to the crystallisation of guarantees granted to customers to fuel its growth in this volatile sector. The

crystallisation of such guarantees would, in particular, affect the position of the reporting entity. The perceived risk relating to guarantees may have been limited by the disclosure that such guarantees had a maximum potential of £900,000 and that the probability of the crystallisation of such guarantees was remote. Such considerations may not have been as vivid in the case of the other reporting entities whose growth was relatively stable or declining.

In summary, the hypotheses that the disclosure of the existence of a remote loss whose outcome cannot be estimated would affect the assessment of performance and position and / or confidence is not supported. This would appear to suggest that events to which the word remote are attached or whose outcome cannot be estimated are disregarded in the consideration of the performance and position of reporting entities. The exception in this instance was the high growth company whose position was perceived in a better light in the context of the disclosure to group L1. The reasons for this increase may be specific to the concerns raised by a high growth (and relatively high debt) company in the technology sector (e.g. overtrading and crystallisation of guarantees or other undisclosed liabilities). The following hypotheses explored the reactions of the experimental groups to further disclosures concerning the remote event in question.

10.3.2 Tests of Hypothesis H3c and Hypothesis H3d

Hypotheses **H3c** and **H3d** suggested that the disclosure of a range of probability for a remote event leading to an inestimable loss (an increase in a liability) would affect the assessments of subjects and their confidence in their assessment. Tables 10.3 to 10.6 present the experimental results relating to L2 .

There was a marked decrease in the assessments of position of Group L2 relative to group L1 (which received a disclosure of a remote probability of loss). This result is consistent with the results noted in the context of assets. This disclosure therefore had a consistent and marked effect on the experimental subjects in the context of both assets and liabilities. However the difference between the assessments of

position of groups L1 and L2 was not consistent to all reporting entities as shown in Tables 10.3 and 10.4. There was an increase in the assessment of the position of HD and DEC and a decrease in the assessments of position of the remaining companies (STA, HG and ND). There was, however, a consistent fall in the assessment of performance of all reporting entities. This fall was most marked in the case of STA, HG and ND (the same companies where the assessment of position fell) and somewhat negligible in the case of HD and DEC. This difference in assessment was significant at a 90% level of confidence in the case of the performance and position of the declining reporting entity (DEC) and at a 95% level of confidence in the case of the position of the stable reporting entity (STA). There was a consistent fall in confidence in the assessments of the position and performance of all companies. There appeared to be no significant variation within groups between the assessments of those who use financial statements and those who do not (see Tables 10.7 and 10.8).

Table 10.7: Disclosure of an uncertain liability: Assessment of the position of the reporting entities: those who use financial statements v. those who do not

	L1[4]		L2[4]		L3[4]	
	Use FS *(n=9)*	Not use FS *(n=12)*	Use FS *(n=12)*	Not use FS *(n=17)*	Use FS *(n=10)*	Not use FS *(n=11)*
High debt (HD)	47.2	36.2	45.0	46.5	30.2	34.5
Declining (DEC)	52.8	38.7	47.5	54.1	52.0	55.5
Stability (STA)	66.7	66.2	61.7	64.8	69.0	62.7
High growth (HG)	73.3	62.9	56.2	48.2	62.0	58.2
No debt (ND)	80.6	67.9	72.9	71.2	85.0	80.0
Total	**64.1**	**54.4**	**56.7**	**57.0**	**59.6**	**58.2**

[4] For key for disclosures, see footnote 1.

Table 10.8: Disclosure of an uncertain liability: Assessment of the performance of the reporting entities: those who use financial statements v. those who do not.

	L1[5]		L2[5]		L3[5]	
	Use FS	**Not use FS**	**Use FS**	**Not use FS**	**Use FS**	**Not use FS**
	(n=9)	*(n=12)*	*(n=12)*	*(n=17)*	*(n=10)*	*(n=11)*
High debt (HD)	51.7	45.0	43.3	49.4	34.0	47.0
Declining (DEC)	46.7	45.4	40.7	47.6	38.0	51.8
Stability (STA)	67.8	71.2	57.9	61.8	60.0	70.0
High growth (HG)	73.2	66.2	69.2	52.9	79.0	63.6
No debt (ND)	74.4	69.6	62.9	67.1	78.0	71.8
Total	**62.8**	**59.5**	**54.8**	**55.8**	**57.8**	**60.8**

These results would appear to suggest, in the broad context, that the quantification of remote as a range of 5% to 8% rather than simply as the word 'remote' undermines subjects' perception of the performance and position of some of the reporting entities whose financial statements were presented in the experiments. As in the case of assets, groups L1 and L2 appear to have inferred that a remote probability represented a probability less than 5% to 8%. Hence the disclosure that management estimated the 'remote' probability as representing a range of 5% to 8% was 'bad news' with the exception of the position of HD and DEC.

It is perhaps worth noting that HD and DEC are assessed as in the weakest positions (and having the weakest performances) by all the experimental groups. The quantification of a 'remote' event may reassure in the context of the poor position of these companies: vague notions of remote events alone may not instill confidence in the abilities of management or in the financial statements themselves given an already poor position. This finding is similar to that in Hypotheses H2a and H2b in chapter 9. Weetman *et. al.* (1994), for example, suggest that disclosures in general and the OFR in particular are used to construct a view of the credibility and awareness of management of their business position. Hence, the disclosure of a remote, inestimable event (as in group L1) in the context of a poor position may not instill confidence in the reporting entity in general while, on the other hand, the ability to quantify a remote event may mitigate such lack of confidence.

[5] For key to disclosures, see footnote 1.

It appears furthermore that the quantification of 'remote' had a particular effect (a decrease) in the case of the reporting entity whose turnover growth was high in the instance of the disclosure of liabilities. This is similar to the findings in chapter 8 that the disclosure of the uncertain nature of financial statements affected the high growth reporting entity (HG) more significantly than other entities. The entities with high debt or no debt were unaffected by the L2 (or A2) disclosure. Their position would appear to be more clear-cut to the experimental subjects as they were ranked as being in the best and worst respectively.

The evidence supports hypotheses **H3c** and **H3d**: the disclosure of a range of probability of remote events affects the assessment of performance and position by the experimental subjects. Furthermore, the findings of Hypothesis H1d in chapter 8 regarding the importance of the characteristics of the reporting entities would appear to be echoed in these disclosures also. The disclosure would appear to undermine stability and accentuate volatility. Those entities with clear characteristics of high debt or no debt appear relatively unaffected.

10.3.3 Tests of Hypothesis H3e and Hypothesis H3f

Hypothesis **H3e** proposed that assessments of the reporting entities would be affected by the disclosure of a range of outcomes of an event whose outcome is inevitable. Hypothesis **H3f** proposed that such a disclosure would affect the confidence of the experimental subjects in that assessment. The mean assessments of Group L3 are presented in Tables 10.3 and 10.4. This group was given the financial statements of the five reporting entities along with the disclosure of the estimated range of outcomes of the increase in liabilities which had a probability of occurrence of between 5% and 8%. In other words, the additional discosure to this group comprised the estimated range of outcomes. In all other respects, the disclosures were similar to the disclosures to Group L2.

There were some significant differences between the assessments of L2 and L3. The overall assessments of Group L3 of the performance and position of the reporting entities were higher than those of Group L2. This increase was maintained across all reporting entities with the exception of HD whose assessment decreased (significantly in the case of position). There was a particularly marked increase in the assessments of the performance and position of HG and ND. As may be noted in Tables 10.3 and 10.4 and also from their characteristics, HD and ND are at both ends of the spectrum of the reporting entities: HD having the lowest position and performance and a high level of debt and ND having the highest position and performance and no debt. Similarly, the performance and position are affected in a converse manner, with the perception of the position and performance of HD weakened by the disclosure in L3 and the position and performance of ND strengthened by the same disclosure.

Throughout the experiments, subjects were asked to comment on the experimental instrument or write any workings they might have on the documentation supplied. In the case of disclosures A3 and L3, several participants calculated the expected value of loss given the probabilities disclosed as £900,000 * 8% * 65% = £46,800. The experimental subjects appear to have judged that the no debt company (ND), having relatively small amounts of liabilities, was in a better position than others to support such losses and that the high debt company (HD) was in an even poorer position given such losses. Similarly, the mean confidence that Group L3 expressed in their assessment was significantly higher than other groups with respect to ND. This increased confidence derived mainly from the increased confidence of those who used financial statements in group L3 relative to those who did not (see Tables 10.9 and 10.10). These differences in confidence and assessments based on experience first identified in chapter 8 are explored further in chapter 11.

Table 10.9: Disclosure of an uncertain liability: Expressions of confidence in the assessment of position of the reporting entities: those who use financial statements v. those who do not.

	L1[6]		L2[6]		L3[6]	
	Use FS	Not use FS	Use FS	Not use FS	Use FS	Not use FS
	(n=9)	*(n=12)*	*(n=12)*	*(n=17)*	*(n=10)*	*(n=11)*
High debt (HD)	72.8	65.0	62.5	62.3	72.0	61.0
Declining (DEC)	63.3	65.4	60.8	60.6	77.0	60.0
Stability (STA)	67.8	71.2	65.8	62.9	88.0	60.0
High growth (HG)	65.0	66.2	65.0	66.5	78.0	60.9
No debt (ND)	73.3	65.4	65.8	62.4	88.0	75.5
Total	**68.4**	**66.6**	**64.0**	**62.9**	**80.6**	**63.5**

Table 10.10: Disclosure of an uncertain liability: Expressions of confidence in the assessment of performance of the reporting entities: those who use financial statements v. those who do not.

	L1[6]		L2[6]		L3[6]	
	Use FS	Not use FS	Use FS	Not use FS	Use FS	Not use FS
	(n=9)	*(n=12)*	*(n=12)*	*(n=17)*	*(n=10)*	*(n=11)*
High debt (HD)	72.2	69.6	68.3	62.4	78.0	70.9
Declining (DEC)	70.6	75.4	67.7	55.9	75.0	61.8
Stability (STA)	67.8	67.9	64.2	58.8	78.0	65.5
High growth (HG)	70.0	68.7	60.0	62.4	85.0	60.0
No debt (ND)	64.4	67.5	62.5	57.1	70.0	61.8
Total	**69.0**	**69.8**	**64.5**	**59.3**	**77.2**	**64.0**

DEC and STA were relatively unaffected by the disclosure L3. However, the assessments of the performance and position by group L3 of the high growth company (HG) was markedly higher than those of group L2 (consistent with the assessment of groups A3 *vis-a-vis* A2 in chapter 9). As was noted in chapter 7, the characteristics of HG are ambiguous particularly with regard to its position: it is characterised by high growth in turnover but also by high debt which is underpinned by a high level of assets and the growth in turnover. As discussed in chapter 5, the research attempts *inter alia* to assess the effects of the disclosures of uncertainty on the perceived ambiguity concerning financial statements and the entities in question. The disclosure in L3, by narrowing the potential misunderstanding of such losses, may help to reduce the ambiguity concerning HG.

The ambiguity with respect to HG may be measured as the standard deviation of the assessments of performance and position. Such ambiguity is measured in Tables 10.11 and 10.12. In this case, it may

[6] For key to disclosures, see footnote 1.

be seen that there is most consistent disagreement among experimental subjects concerning HG and HD. In the case of HG, however, this ambiguity is lowest in the case of group L3. Hence in the context of the assessment of position, the disclosure of L3 served to reduce the ambiguity concerning the position of HG (i.e. given the estimability of outcome). It also served to restore the perception of the performance of HG to the level it was assessed at prior to the disclosure L2. In other words, explanations for the increased assessment of the performance of HG emanate from the diminished perception of its performance given L2 (discussed earlier): disclosure L3 merely reinstates the perception of its performance by clarifying the potential extent of loss. Given such varied results between reporting entities, hypothesis **H3e** is unsupported although it is clear that the disclosure had some inconsistent effects given the characteristics of the reporting entities.

The experimental subjects' expressions of confidence in their assessments were consistently greater in group L3 than in other groups. This confirms hypothesis **H3f**. It is consistent with the expectation that disclosure L3 is the clearest, most crisp (in Chesley's (1988) phrase) of the disclosures. The increased confidence is most marked (significant at a 95% level of confidence) in the case of the position of ND. This is consistent with the assessment of performance and position of ND which also increased significantly in the light of disclosure L3. Hence, the perception of performance and position of ND, which was always clearcut and strong, became even more so given L3.

There appeared to be no significant difference between the assessment of position of those who use financial statements in Group L3 and those who do not (Tables 10.9 and 10.10). In the context of the performance of the reporting entities, however, those who use financial statements assessed the performances of HD, DEC and STA as significantly lower than those who do not use financial statements, while they assessed the performances of HG and ND as significantly higher. Overall, however, there was no marked difference in the assessment of performance of both groups. Any differences between them were confined to differences between their assessments of the reporting entities rather than overall differences resulting from the disclosure of the range of outcomes. Those

who use financial statements attached more importance to growth and decline of turnover in assessing performance than those who did not use financial statements.

It would appear, given such varied results, that hypotheses **H3e** is unsupported while there is some evidence to support hypothesis **H3f**. As in the case of assets, the most marked differences in the mean assessments of the experimental subjects appear to arise from the disclosure of the range of probability of a remote event rather than the range of outcomes of the event. The implications of such a finding are similar to the findings in chapter 7: that the range of outcomes disclosed (35% - 65%) did not add to or alter the impression of inestimability attached to the disclosure given and that the more concrete effect seems to have arisen from the clarification of the remote probability of loss.

10.3.4 Comparison with other studies

These results, in the case of both assets and liabilities, concur with Chen's tentative conclusion that (Chen, 1974, pp. 163 and 204) 'removing the appearance of certainty from accounting is not without effect.' (The background to Chen's study and his *modus operandi* are discussed in chapter 4). He found that subjects tended to allocate significantly higher levels of (hypothetical) investment funds to the reporting entities which presented their financial statements in probabilistic form leading him to suggest (p. 204) that 'evidently subjects overestimate risk on the basis of data with the appearance of certainty'. The overall results (although like Chen's not having a strong significance) are consistent with Chen's findings that subjects gave a slightly stronger assessment of the performance and position of the reporting entities disclosing the uncertain nature of certain aspects of financial statements. There is a clear exception, however, in the case of the clarification of the Directors' estimate of remote (groups A2 and L2).

Chen, however, found a (non-significant) reduction in the confidence of the experimental subjects given increased information regarding uncertainty. He found this 'important . . . when the kind of data

provided was supposed to have more information' (p. 165). Confidence is relatively unaffected by the increased information concerning the uncertainties which are the subject of this research except, once more, the disclosures A2 and L2. Overall confidence decreases in each of these instances, significantly in the case of some reporting entities. Hence, there is some consistency between the findings in this research and those of Chen (1974). The varied nature of the findings here, however, appear to offer a richer explanation of such diminishing confidence: that the expressed confidence is based on the clarification of the disclosure of remote relative to a benchmark perception or preconception of 'remote'.

Oliver (1972) argued (p. 165) that 'it can be concluded that the bankers [who were the subjects of his experiments] did not significantly alter their hypothetical loan decisions, even though the two study groups received different types of financial statements [one 'conventional', the other 'probabilistic']'. (Again, this work is introduced in some detail in chapter 4.) Birnberg and Slevin (1976) draw on and extend the work of Oliver (1972). (As noted in chapter 4, they used skewed confidence intervals where Oliver used a symmetrical distribution. Birnberg and Slevin's context was not an accounting one.) Like Oliver, they found little difference between the assessments of those users who received point-estimate financial statements and those who received confidence interval statements. The findings of this research differs from those of Oliver and Birnberg and Slevin and is closer to those of Chen.

The research itself differs, however. The hypotheses developed are not limited to measuring only the reaction to the disclosures outlined. The nature of consensus given the need for inference, and the messages which may be drawn from such consensus, are also explored. The research also examines any differecnes between these inferences in the context of assets and liabilities. The next sections discuss the research results in the light of these objectives.

10.3.5 Test of Hypothesis H3g and Hypothesis H3h

Hypotheses **H3g** and **H3h** deal with the intersubjective understanding of the concepts included in the disclosures in question. Tables 10.11 and 10.12 present the standard deviations of the experimental subjects' assessments of the performance and position of the reporting entities.

Hypotheses **H3g** and **H3h** proposed that the disclosure of information concerning the range of probability of a remote event and the range of outcomes among inestimable outcomes would lead to greater consensus among the experimental subjects. These propositions were based on the notion that greater consensus or unanimity would arise out of increased information concerning concepts such as 'remote' and 'inestimable'. Hence, the clarification of the directors' understanding of remote and inestimable would lead to a more shared understanding of such disclosures.

Table 10.11: Disclosure of an uncertain liability: Standard deviations of the assessment(s) of the position of the reporting entities

Reporting entity	Control group[7] *(n=29)*	L1[7] *(n=21)*	L2[7] *(n=29)*	L3[7] *(n=21)*
High debt (HD)	19.1	24.4	22.5	15.0
Declining (DEC)	13.7	17.0	16.4	19.4
Stability (STA)	13.5	12.2	18.2	15.8
High growth (HG)	25.3	17.6	21.9	14.3
No debt (ND)	12.3	16.8	18.9	7.7
Mean Standard Deviation	**16.8**	**17.6**	**19.6**	**14.4**

Table 10.12: Disclosure of an uncertain liability: Standard deviations of the assessment(s) of the performance of the reporting entities

Reporting entity	Control group[7] *(n=29)*	L1[7] *(n=21)*	L2[7] *(n=29)*	L3[7] *(n=21)*
High debt (HD)	12.2	19.3	17.5	13.6
Declining (DEC)	16.7	21.7	22.6	17.9
Stability (STA)	17.6	11.2	17.6	19.5
High growth (HG)	22.1	15.4	22.7	21.5
No debt (ND)	20.1	11.5	19.4	13.0
Mean Standard Deviation	**17.7**	**15.8**	**20.0**	**17.1**

[7] For key to disclosures, see footnote 1.

The approach adopted to measure the consensus or 'intersubjective reality' of such disclosures is identical to that in chapter 9. The results in Tables 10.13 and 10.14 illustrate that once more the most marked changes in the standard deviation of the subjects' assessments of both performance and position occurred with respect to Group L2 (increased standard deviation). This finding is consistent with that in the case of assets in the sense that the most marked effect on consensus in the assets groups (in chapter 9) was in A2. However, the disclosure resulted in decreased dispersion in the case of A2 and increased dispersion in the case of liabilities. This suggests that the disclosure of the range of probabilities of the remote event strengthened the shared understanding of Group A2 (assets) but led to less consensus among Group L2 (liabilities). Such differences between reactions in the domains of assets and liabilities are discussed in the next section to this chapter.

Exploring the impact of the disclosures in a general sense, the effects on the standard deviation of the assessments of the experimental groups appears to confirm the earlier findings in this chapter that the disclosure of the range of probability of a remote event (disclosed to Groups A2 and L2) was more influential than the other disclosures whether it served to strengthen or weaken consensus. Furthermore, within Group L3 the strongest consensus is with regard to the assessment of the position of ND echoing the strong assessment given by this group to the position of ND in Table 10.3 and the significant effect this disclosure appeared to have on the assessment of position of ND.

Hence in those instances where disclosures had an effect on the assessments of the experimental subjects, they also seemed to have an effect on the consensus of subjects. Hypotheses **H3g** and **H3h** are supported to that extent. Such effects on consensus are however less marked and less consistent when examined for each reporting entity. With the exception of the marked effect on the assessment of ND in Group L3 noted above, the pattern of consensus does not follow to any significant extent the pattern of assessment with respect to DEC and STA. In fact, there is no discernible or consistent pattern of consensus in the individual entity context.

10.4 DIFFERENCES IN ASSESSMENTS IN THE CONTEXT OF ASSETS AND LIABILITIES

Chapter 9 explored the results of the disclosures of a remote and inestimable event in the context of assets. The earlier part of this chapter explored the effect of identical disclosures of liabilities. As outlined in the first section of this chapter, accounting conventions demand an assymmetric approach to the recognition (though not necessarily the measurement) of assets and liabilities. In particular, more evidence is required for the recognition of an asset than the recognition of a liability. The assumption of such assymmetry appears to be that information regarding uncertain assets will cause more concern than the same information regarding uncertain liabilities. This leads to the hypotheses developed in section 6.4.1. Further hypotheses were developed in Section 6.4.1 concerning differences between outcome and occurrence in the context of assets and liabilities. These hypotheses are set out in Table 6.3 and are summarised briefly at the beginning of sections 10.4.1.

10.4.1 Tests of Hypotheses H3i to H3p

Section 6.4.1 suggested that the assumption of the ASB's assymmetric approach to the recognition of assets and liabilities (ASB, 1995b; ASC, 1980) is that there would be more concern regarding uncertain assets than uncertain liabilities. As a result, the disclosure of an uncertain asset would lead to lower assessments of the position and performance of the reporting entities than the disclosure of an uncertain liability (hypotheses **H3i** and **H3k**) and / or a lower level of confidence in those assessments (hypotheses **H3j** and **H3l**). Furthermore, hypotheses **H3m** and **H3o** proposed that these lower assessments of position and performance respectively would not differ between outcome and occurrence. Hypotheses **H3n** and **H3p** made similar proposals regarding the expression of confidence in the assessments of position and performance.

The assessments of the performance and position of the reporting entities and the expressed confidence in those assessments are given in Tables 10.13 to 10.16. These assessments are divided between those who received disclosures of assets (the 'assets group') and liabilities (the 'liabilities group'). Chapter 9 and the earlier part of this chapter discussed the differences between the nature of each disclosure (i.e. between A1, A2 and A3 in chapter 9 and L1, L2 and L3 in this chapter). This discussion is concerned with the differences between the disclosures in the domain of assets and liabilities (i.e. between A1 and L1, A2 and L2 and A3 and L3).

Table 10.13:[8] Mean assessment of the position of the reporting entities: asset groups to liability groups.

Reporting entity	Group A1 (n=29)	% change	Group L1 (n=21)	Group A2 (n=32)	% change	Group L2 (n=29)	Group A3 (n=26)	% change	Group L3 (n=21)
High debt (HD)	45.3	-9%	41.0	39.1	+17%	45.9	47.4	-31%@	32.5
Declining (DEC)	59.8	-25%	44.8	46.5	+10%	51.4	44.3	+21%@	53.8
Stability (STA)	62.4	+6%	66.4	54.8	+16%@	63.5	53.7	+22%@	65.7
High growth (HG)	50.7	+33%@	67.4	54.8	-6%	51.6	61.5	-2%	60.0
No debt (ND)	72.1	+2%	73.3	71.2	—	71.9	72.5	+14%#	82.4
Overall	**58.1**	**+5%**	**60.9**	**53.3**	**+4%**	**55.4**	**55.9**	**+7%**	**59.9**

@= significant at 95% level of confidence.
#= significant at 90% level of confidence.

Table 10.14:[8] Mean assessment of the performance of the reporting entities: asset groups to liability groups.

Reporting entity	Group A1 (n=29)	% change	Group L1 (n=21)	Group A2 (n=32)	% change	Group L2 (n=29)	Group A3 (n=26)	% change	Group L3 (n=21)
High debt (HD)	47.5	+1%	47.9	41.5	+13%#	46.9	44.7	-3%	43.3
Declining (DEC)	55.4	-17%	46.0	38.7	+16%	44.8	39.2	+15%@	45.2
Stability (STA)	54.5	+28%@	69.8	56.8	+6%	60.2	51.5	+27%@	65.2
High growth (HG)	59.5	+16%@	69.3	59.2	+1%	59.7	62.8	+13%	71.0
No debt (ND)	64.6	+11%#	71.7	67.7	-4%	65.3	64.5	+16%#	74.7
Overall	**56.3**	**+4%**	**58.6**	**52.8**	**+8%**	**56.9**	**52.5**	**+12%**	**58.9**

@= significant at 95% level of confidence.
#= significant at 90% level of confidence.

[8] **A1:** profit and loss account and balance sheet with the disclosure of the remote possibility of a remote event which may cause an inestimable decrease in stock with a maximium exposure of £900,000 as in Figure 7.2.
A2: as A1, quantifying the remote probability as between 5% and 8% as in Figure 7.4.
A3: as A2, quantifying the inestimable outcome as between 35% and 65% of the maximum exposure as in Figure 7.6.
L1: as A1 except that disclosure relates to the remote possibility of an inestimable increase in a guarantee as in Figure 7.3 rather than a decrease in stock.
L2: as A2 except that disclosure relates to the remote possibility of an inestimable increase in a guarantee as in Figure 7.5 rather than a decrase in stock.
L3: as A3, except that disclosure relates to the remote possibility of an inestimable increase in a guarantee as in Figure 7.7 rather than a decrase in stock.

Table 10.15[9]: Expression of confidence in the assessment of the position of the reporting entities: asset groups to liability groups.

Reporting entity	Group A1 (n=29)		Group L1 (n=21)	Group A2 (n=32)		Group L2 (n=29)	Group A3 (n=26)		Group L3 (n=21)
		% change			%change			% change	
High debt (HD)	67.4	+1%	68.3	62.3	—	62.4	62.0	+7%	66.2
Declining (DEC)	67.2	-4%	64.5	63.2	-4%	60.7	64.5	+6%	68.1
Stability (STA)	65.9	+6%	69.8	62.4	+3%	64.1	69.8	+5%	73.3
High growth (HG)	67.1	-2%	65.7	63.7	+3%	65.9	65.7	+5%	69.0
No debt (ND)	68.8	—	68.8	69.1	-8%	63.8	68.8	+18%#	81.4
Overall	**67.3**	—	**67.4**	**64.1**	**-1%**	**63.4**	**64.1**	**+12%**	**71.6**

#= significant at 90% level of confidence.

Table 10.16:[9] Expression of confidence in the assessment of the performance of the reporting entities: asset groups to liability groups.

Reporting entity	Group A1 (n=29)		Group L1 (n=21)	Group A2 (n=29)		Group L2 (n=32)	Group A3 (n=26)		Group L3 (n=21)
		% change			% change				% change
High debt (HD)	62.5	+6%	66.2	63.5	-7%	59.3	63.3	+4%	65.7
Declining (DEC)	65.2	+12%	73.3	60.5	—	60.8	63.7	+7%	68.1
Stability (STA)	63.7	+7%	67.9	62.3	-2%	61.0	66.8	+7%#	71.4
High growth (HG)	66.1	+5%	69.3	56.3	+9%	61.4	63.7	+13%#	71.9
No debt (ND)	68.0	+4%	70.7	65.6	-1%	64.8	68.8	+8%#	74.3
Overall	**65.1**	**+7%**	**69.5**	**61.6**	—	**61.5**	**65.2**	**+8%**	**70.3**

 # = significant at 90% level of confidence.

[9] For explanations of levels of disclosure, see footnote 8.

The assessments of those receiving the disclosure regarding assets are consistently lower on an *overall* basis than the assessments of those receiving disclosures concerning liabilities. Overall, this suggests that *ceteris paribus* uncertain decreases in assets cause greater concern than uncertain increases in liabilities. Resulting assessments, given the disclosure of uncertainty, are lower in the case of the assets group than the liabilities group. This concern extends also to the expressions of confidence of the groups.

Tables 10.13 to 10.16 show the differences within each disclosure including those differences that are significant at a 90% and 95% level of confidence. These tables illustrate that the subjects' overall assessments of the reporting entities where uncertain assets are disclosed are consistently lower than those of the reporting entities where the corresponding uncertain liabilities are disclosed. Analysing the differences between the reporting entities, there are two marked exceptions to this overall trend: that of DEC (assessment of A1 > L1) and HD (assessment of A3 > L3). In the case of HD, this is intuitively sensible as the defining characteristic of HD is its high level of debt and hence one would expect that the disclosure of a potentially greater liability in HD would concern the experimental subjects to a greater extent than the disclosure of an uncertain asset.

The situation is less clear in the case of DEC. As noted in chapter 9, the assessment of group A1 represents a significant increase over the assessment of the control group. Similar to the analysis in that context, perhaps there is already heightened concern regarding stock in group A1 (in the light of declining sales in a volatile sector), that the focus in DEC is on stock as a result and that the disclosure alleviates some of the concerns of the experimental subjects with regard to DEC. The L1 disclosure would not serve to alleviate such concerns and, therefore, the assessment of group A1 is greater than that of L1.

This research concerned itself with an uncertain recognised asset (a potential loss) and an uncertain unrecognised liability (also a potential loss). The disclosures differ in two respects. First, one set of disclosures relates to assets, the second set to liabilities. Secondly, one set reveals information about recognised items, the other about unrecognised items. The heightened effect therefore of the different

disclosures may either be due to heightened concern about uncertain assets relative to uncertain liabilities or a concern that uncertain items (even though the level of uncertainty is remote) have been recognised. Further analysis of the differences in assessments, however, offers more insight into the source of the differences in the assessments.

The previous chapter noted significant differences between the type of disclosure in the context of the probability of the occurrence of the loss (i.e. groups 2). The findings discussed earlier indicated that the experimental subjects' understanding of what constitutes a remote event was lower than the range disclosed in the experiments (5% to 8%). This difference existed in the context of both assets and liabilities. When comparing the assessments of groups A2 and L2, the assessments of group A2 are lower than L2 overall with some relatively minor and non-significant exceptions. Hence while the definition of remote (as less than 5% to 8%) is consistent between assets and liabilities, the disclosure again causes more concern when it relates to assets than liabilities. This suggests either that the definition of remote is even less for an asset than a liability or that once the threshold of definition is breached, this causes greater concern when it is breached for an asset than for a liability. Both of these conclusions run counter to the ASB's views (and the requirements of accounting standards) regarding the asymmetric recognition (or non-recognition) of assets and liabilities. This finding is explored in more detail later in this chapter in the light of the perceptions of the reliability of assets and liabilities.

However, the most significant differences appear to occur in the context of the initial, general disclosure of the uncertainty of the assets and liabilities (i.e. groups 1) and in the context of the clarification of the range of inestimable loss (i.e. groups 3). The differences between Groups A1 and L1 indicate, further, that the disclosure of a possibility of a remote decrease in a recognised asset concerns the experimental subjects more than the possibility of a remote increase in a recognised liability.

When Groups A3 and L3 are considered, the disclosure of the range of the inestimable loss appears to have had an effect on the assessments of the experimental subjects with the assessment of those receiving the disclosure in the domain of assets significantly less than those receiving the disclosure in the

domain of liabilities. This effect was particularly significant and persistent in the context of the stable company (STA) and the company with no debt (ND). In both instances, the perception of the reporting entities recovers in the case of Group L3 to the level of Group L1 having fallen in the case of L2. There is also a recovery in the case of the assessment of A3 but not to the level of A1 and not to the same extent as the recovery in the context of liabilities. Therefore the clarification that an inestimable loss is potentially between 35% and 65% allows for a recovery of the perception of the reporting entities when the uncertainty concerns a liability to a greater extent than when that same uncertainty concerns an asset.

These findings suggest that the experimental subjects allow the non-recognition of an inestimable liability while being less tolerant of the recognition of a similarly inestimable asset. Parsing the two reasons outlined above, they suggest that the differences between the assessments of Groups A and Groups L are not due to the context of assets and liabilities (as these would differences would be marked in the context of occurrence alone) but are instead due to the difference of recognition and non-recognition. It appears, therefore, given no other factors, that hypotheses **H3i** to **H3l** are supported. Hypotheses **H3m** to **H3p** are unsupported. However, these findings must be treated cautiously as expectations of the reliability of financial statement items differ between the assets groups and the liabilities groups and between stock and accruals. The next section discusses the role of such expectations in forming these assessments.

10.4.2 The role of expectations of reliability

Chapter 8 discussed the role of expectations of the reliability of financial statements in the formation of assessments. That discussion focused in particular on the aggregate assessment of the reliability of a number of financial statement items. The impact of this aggregate assessment on the reaction to the broad disclosure of the uncertain nature of financial statements was then discussed.

The focus of this section is the differences between the assessments of groups receiving information concerning an uncertain asset (stock) and an uncertain liability (an accrual for a guarantee). *A priori* perceptions of the reliability of such items may affect the reactions of the experimental groups to the disclosures in question. Of further interest are the perceptions of the reliability of such items given the prudence concept and the general principle that more evidence is required for the recognition of an asset than the recognition of a liability. This principle implies that recognised assets are at least as reliable, if not more reliable, than recognised liabilities.

Table 10.17 presents the mean assessments of the reliability of particular financial statement items by the experimental groups.

Table 10.17:[10] Mean assessment of the reliability of financial statement items

Financial statement item	Control group	A1	A2	A3	L1	L2	L3
Trade debtors	79.1	67.6	72.2	72.3	68.8	65.0	75.7
Prepayments	70.9	64.1	72.5	60.0	64.5	64.3	78.1
Stock	65.0	55.5	52.0	51.1	54.0	49.6	61.9
NBV of fixed assets	52.6	51.6	48.1	47.3	51.2	44.7	57.1
Asset items	*66.9*	*59.7*	*61.2*	*57.8*	*59.6*	*55.9*	*68.2*
Trade creditors	74.0	70.5	68.3	70.4	66.0	65.0	73.3
Accruals	59.8	59.5	59.7	56.9	68.8	56.7	63.3
Liability items	*66.9*	*65.0*	*64.0*	*63.6*	*67.4*	*60.8*	*68.3*
TOTAL	66.9	61.5	62.1	59.7	62.2	57.6	68.3

No significant differences emerge between the two broad groups' mean assessment of the reliability of financial statement items. Liabilities are generally viewed as more reliable than assets. (Differences within the groups, based for example, on experience, are discussed in chapter 11.) This is the converse of what might be expected given the prudence concept. The constraints of prudence imply (ASB, 1995b, p. 46) 'that income or assets are not overstated and expenses or liabilities are not understated'. Reliability, however, is not limited to recognition / non-recognition. It includes 'faithful representation' and 'substance'. Faithful representation of the effect of a transaction or other event includes the consideration of recognition *and* valuation (ASB, 1995b, p. 45). The evidence here may justify in a

[10] For explanation of levels of dislosure, see footnote 8.

certain context the ASB's concerns regarding the valuation and broader reliability of assets (particularly tangible fixed assets).

The experimental disclosures in this research involve the disclosure of uncertainty regarding the asset of stock and, separately, regarding the liability of accruals. There is a significant difference (at a 99% level of confidence) between the overall perception of the reliability of stock (mean 54.2, standard deviation 20.2) and of the reliability of accruals (mean 59.6, standard deviation 18.4). Hence, the differing assessments of the disclosures of uncertainty relating to stock and accruals may be influenced by the differing initial perceptions of the reliability of stock and accruals.

Extending this analysis further, the assessment of stock by the asset groups (A1 to A3) averages 52.9 while the assessment of accruals by the liability groups (L1 to L3) averages 62.2 (Table 10.17). Hence, the two groups have quite different perceptions of the reliability of the financial statement items that are the subject of the disclosure of uncertainty. Groups A1 to A3 receive the disclosure of uncertainty regarding stock while groups L1 to L3 receive the disclosure of uncertainty regarding accruals.

As was noted earlier (Table 10.13 and 10.14), the assessments of the performance and position of the asset groups are lower than those of the liability groups. Hence, the direct comparison of these two broad groups should consider pre-dispositions towards the uncertainties which are disclosed. For example, stock is generally perceived as being less reliable than accruals. The disclosure of uncertainty regarding stock leads to a lower assessment of reporting entities than the disclosure of uncertainty regarding accruals. Given the relative perceptions of these financial statement items, it appears that the disclosure regarding stock renders the position more uncertain than does the same disclosure regarding accruals. There is less confidence regarding stock to begin with: the disclosure of its related uncertainty serves to undermine the reliability of stock still further. Accruals are perceived as more reliable.

Hence, the differing assessments of the reporting entities may stem from different anchors of perception regarding stock and accruals. This does not weaken the earlier arguments. In fact, it strengthens and explains the conclusions drawn that uncertainty regarding stock leads to more concern regarding the reporting entities. There is initially more concern anyway regarding stock. The disclosure of an uncertainty of that stock therefore creates more concern (and a weaker assessment of the reporting entities) than a similar disclosure regarding liabilities. The results in Table 10.17 explain the origins of such concerns.

10.5 CONCLUSION

This chapter explored two aspects of the experimental results. First, the experimental results in the context of the disclosure of uncertain liabilities were discussed (in Sections 10.2 and 10.3). Second, following from this discussion, Section 10.4 explored the differences, if any, arising from the disclosure of uncertainty in the domain of assets and the domain of liabilities.

Chapters 2 and 6 discussed the origins of the assymetric approach to the recognition of disclosure of assets and liabilities in financial statements. Such an approach is symptomatic of the fundamental accounting principle of prudence. This concept has evolved to embrace more recently the principle that more evidence is required for the recognition of an asset than for the recognition of a liability. As a result of such fundamental concepts, Section 6.4 hypothesised that it may be expected that uncertainty regarding liabilities would cause more concern (and hence lower assessments of the performance and position of reporting entities and lower expressions of confidence in those assessments) than similar disclosures in the case of assets. Section 10.2 restated these hypotheses.

Section 10.2 also outlined the research results in the context of the disclosure of uncertain liabilities. Section 10.3 then explored these reactions in some detail. The direction (but not the extent) of such reaction was broadly similar to that noted in the case of assets (in chapter 9). The disclosures affected

the assessments and expressed confidence of groups L2 adversely, consistent with the suggestion in the disclosure of assets that the experimental subjects had a lower expectation of 'remote' than 5% to 8%. Hypotheses **H3c** and **H3d** were therefore supported. In the other disclosures (and hypotheses **H3a, H3b, H3e** and **H3f**), however, the results were less clear with the reaction to the disclosures differing between reporting entities. This was again consistent with chapter 9 and consistent with the findings of, for example, Danos *et al.* (1989) who found dissimilar patterns of response between weak and strong reporting entities. As regards the effects of the disclosures on the level of consensus or 'intersubjective reality' as expressed in hypotheses **H3g** and **H3h**, the results on an overall level showed some support for these hypotheses although these results were not consistent across all reporting entities.

Differences between the assessments of the reliability of financial statement items between the asset groups and the liability groups were discussed further in Section 10.4. The overall assessment of financial statement items did not differ between these groups. However, all groups viewed assets as being less reliable than liabilities. This conflicts with the ASB's view and the generally accepted accounting principle that more evidence is required for the recognition of an asset than a liability. In particular, stock (which was the focus of disclosure in the asset groups) is viewed as significantly less reliable than accruals (which was the focus of disclosure in the liability groups). This particular finding has two implications: one specific to the findings of this research (and hypotheses **H3i to H3p**), the second general to the framework of accounting.

The implications specific to this research are that the differences in the assessments of the asset groups and the liabilities group do not arise from a view that assets should be more reliable and firm than liabilities. These differences may, in fact, arise from a heightened, reinforced concern for the reliability of assets. In other words, the disclosure of the uncertainty relating to assets may not necessarily undermine the experimental subjects' faith in the reliability of assets but may serve to reinforce their perception regarding the reliability (or relative lack of reliability) of assets. As a result, the findings supporting hypotheses **H3i to H3l** result from initial perceptions of the unreliability of assets relative to liabilities

rather than from any undermining of faith regarding the reliability of assets: the disclosure of the uncertain assets serves to heighten the subjects' perceptions rather than undermine them.

This finding has general implications for the accounting field also. It appears from the perceptions of the reliability of assets and liabilities expressed by the experimental subjects that the notion that assets are more reliable, requiring a higher threshold for recognition, is not be shared by the experimental subjects. It would appear, therefore, that this principle of asymmetric recognition is largely aspirational in the eyes of the experimental subjects.

The notion of reliability, however, transcends recognition issues alone. Reliability includes representational faithfulness: that the item represents what it purports to represent (ASB, 1995b, p. 44). Reliability therefore includes reliability of measurement also, in which case the experimental findings would support the ASB's focus on the measurement of assets (through, for example, its Discussion Paper on the *Measurement of Tangible Fixed Assets* (ASB, 1996)) as well as their recognition. The following chapter will analyse these findings in more detail, looking in particular at any differences between assessments deriving from experience and gender.

CHAPTER 11

THE EFFECTS OF SUBJECT CHARACTERISTICS ON ASSESSMENT AND CONFIDENCE

11.1 INTRODUCTION

Previous chapters (i.e. chapters 8, 9 and 10) explored the effects of the disclosure of uncertainty on the assessments and confidence of the experimental subjects. This chapter discusses the effects of some of the characteristics of the experimental subjects on their assessments. As such, the chapter does not focus, as heretofore, on differences between groups but on the experimental subjects as a whole, categorising them in accordance with several key characteristics and exploring differences between the assessments of these different categories.

The chapter draws broadly on the findings of Birnberg (1976, p. 212) that 'the users or consumers of financial outputs are not a homogeneous class. They differ in their ability to handle abstract concepts, their expertise in the areas of accounting and financial analysis, the data sources open to them and their experience in dealing with the information available for financial decisions'. More recently, Maines (1996, p. 98) has commented that 'research on external users has not thoroughly exploited the heterogeneity of users of financial reports'. This chapter attempts to address this absence in the particular context of this research.

The chapter is in three sections. The first section (Section 11.2) identifies the main characteristics of the experimental subjects, in particular those common characteristics which render statistical analysis meaningful. In particular, Section 11.2 draws on some of the characteristics of the experimental subjects identified in chapter 5. Section 11.3 discusses the literature with regard to the potential impact of these characteristics on assessments and confidence. Some research hypotheses in this particular context are also established. The testing of these hypotheses is then discussed and some comparisons are made between the research results and the literature in the area. The third and final section, Section 11.4, summarises the results and draws some broad conclusions from the results.

11.2 CHARACTERISTICS OF THE EXPERIMENTAL SUBJECTS

Chapter 5 discusses the experimental method and the characteristics of the experimental subjects in some detail. To reiterate, there were 291 experimental subjects in all. The first section of the experimental instrument (in the appendix to chapter 7) identified some broad characteristics of the experimental subjects. These included age, gender, educational background, workplace, employment experience and the use of financial statements during employment. The experimental subjects were also asked five multiple choice questions to determine their aptitude in the use of financial statements. They were also asked their opinion concerning the reliability of a number of financial statement items.

The results of the 'aptitude test' are set out in Table 11.1.

Table 11.1: Aptitude scores of experimental subjects

SCORE	NUMBER OF SUBJECTS	%
0	1	-
1	20	7
2	55	19
3	102	35
4	96	33
5	17	6
	291	291

In the exploration of the experimental results in chapters 8 to 10, those experimental subjects who achieved less than 3 out of 5 of the aptitude questions correct (i.e. those scoring less than or equal to 40%) were excluded from consideration. The number of experimental subjects excluded in that manner totalled 76, the remainder being 215. The experimental subjects were allocated randomly between the experimental groups. With few exceptions (these exceptions are dealt with in chapters 8 to 10) there was no significant difference between the characteristics of the members of the experimental groups. These characteristics do not therefore represent potential extraneous variables on a widespread scale.

This chapter will assess differences, if any, between subjects based on their scores in the aptitude test. The literature concerning the effects of ability (and / or what is termed in this context `aptitude') on assessments and confidence will also be discussed (specifically in Section 11.3.2). It would appear reasonable to establish three categories of aptitude: low aptitude (0 - 2 inclusive) containing 75 subjects, modal aptitude (the mode = 3) containing 102 subjects and high aptitude (4 and 5) containing 113 subjects. Having established research hypotheses in this context in the Section 11.3, these hypotheses will be tested using comparison of means across these categories. As a by-product of these results, the consideration of aptitude will include the differing characteristics, if any, of the different categories of aptitude scores.

As the exploration of the main body of the research (in chapter 8 to 10) excluded those scoring less than or equal to two out of five, for the purposes of consistency, the remaining discussion in this chapter similarly excludes these subjects. Of the 215 cases remaining, their overall characteristics are as presented in Table 11.2 to 11.9:

Table 11.2: Gender of experimental subjects.

GENDER	**No.**	**%**
Male	125	58
Female	90	42
	215	

Table 11.3: Current course attendance by experimental subjects.

COURSE ATTENDANCE	No.	%
None	77	36
BA in Accounting&Finance	59	27
MBS in Accounting	25	12
M.Sc. in Investment&Treasury	33	15
MBA	21	10
	215	

Table 11.4: Graduate composition of experimental subjects.

GRADUATE OF	No.	%
None	70	33
BA in Accounting&Finance	29	13
MBS in Accounting	58	27
M.Sc. in Investment&Treasury	18	8
Other	40	19
	215	

Table 11.5: Professional membership of experimental subjects.

PROFESSIONAL BODIES	No.	%
None	168	78
Institute of Investment Management & Research	9	4
Institute of Chartered Accountants in Ireland	24	11
Certified Institute of Management Accountants	2	1
Other (mainly engineers)	12	6
	215	

Table 11.6: The use of financial statements by the experimental subjects.

USE OF FINANCIAL STATEMENTS	No.	%
Not in employment	91	42
In employment - use financial statements	98	46
In employment - do not use financial statements	26	12
	215	

Table 11.7: Age of the experimental subjects.

AGE	No.	%
Less than 20	44	20
21 - 25	131	61
26 - 30	24	11
31 - 35	8	4
36 - 40	6	3
Over 40	2	1
	215	

Table 11.8: Place of employment of experimental subjects

EMPLOYMENT	No.	%
None	91	42
'Big 6' accountancy firm	36	17
Other accountancy firm	12	6
Financial institution	37	17
Manufacturing firm	15	7
Service organisation	6	3
Other (mainly state / semi-state)	18	8
	215	

Table 11.9: Years in employment of the experimental subjects.

YEARS IN EMPLOYMENT	No.	%
None	91	42
Less than one year	45	21
Between one and two years	33	15
Between two and three years	20	9
More than three years (up to 23 years)	26	13
	215	

Differences between those employed and not employed will be explored in the context of the use of financial statements (Table 11.8). Within the category of those employed it would appear reasonable to examine differences between those working in accountancy firms (48), financial institutions (37) and elsewhere (36).

The main (and most populated) characteristics of experimental subjects are, therefore, gender, employment category and experience, course attendance and use of financial statements. The main characteristics which this chapter will consider are gender and experience. The former is clearly

defined. The latter will comprise the consideration of various factors such as employment category, experience and use of financial statements. There is some overlap between, for example, course attendance, employment and use of financial statements as all of those attending undergraduate courses were not in full-time employment (and not therefore classified as employed) and furthermore, did not, therefore, use financial statements as part of their employment. These differences will be teased out as part of the consideration of the effect of the experience of the experimental subjects.

As the age of the experimental subjects is centred around the 21 - 25 age group (comprising 61% of the experimental subjects), it is not proposed to examine the effects of age on the assessments or expressed confidence of the experimental subjects. For the same reason, professional membership will not be considered as only 12% of those participating were members of a professional accounting body with a further 4% being members of the IIMR. Similarly, the current year of study of those attending courses of study will not be considered due to the relatively small numbers involved and the fact that such attendance comprises different milestones: the courses involved involve one, two and three years, part-time and full-time, undergraduate and post-graduate study. The consideration of years of study without the further consideration (and dilution of numbers) of those other characteristics would be potentially misleading and meaningless. Instead, the overall educational experience of subjects will be considered including the effect, if any, of courses of study pursued currently and in the past.

11.3 EFFECTS OF THE CHARACTERISTICS OF THE EXPERIMENTAL SUBJECTS

11.3.1 Gender

Several studies have been carried out on the effects of gender of ratings and self-confidence although none of these has been in the context of accounting tasks. These studies have been carried out in both laboratory and organisational contexts. First, Maccoby and Jacklin (1974) in a comprehensive review of the literature referring to the laboratory setting at the time found that women have less positive 'self-referent' attitudes than men in differing contexts. In particular, they concluded that women have lower expectations of their own performance, value their abilities lower and also evaluate their own completed performance lower than their male counterparts.

Deaux and Farris (1977) and Lenney (1977) drew similar conclusions. Deaux and Farris (1977) and Lundeberg, Fox and Puncochar (1994) concluded that men rated their own performance higher than women even when more objective scores of their performances were similar. Furthermore, Lenney (1977) argued that where feedback is absent or where social cues are salient, men tend to overestimate and women tend to underestimate their own performance. However, Lenney (1977) suggested that gender differences are unlikely to occur where the individuals in question are given clear information regarding their ability to perform the task. Similarly, a subsequent study (Lenney, Browning and Mitchell, 1980) found that gender differences in self-evaluation were less marked when performance criteria were clear.

On the other hand, Snyder and Bruning (1979) and Shore and Thornton (1986) observed no gender-based differences in self-ratings. Lundeberg *et. al.* (1994, p. 119) concluded, albeit in a narrow context, that there was 'scant evidence to support the notion that women have low confidence'. Shore and Thornton (1986) argue, however, that in organisational settings, various factors, such as feedback for example, may influence such ratings, rendering these findings consistent perhaps with those of Lenney (1977) in the laboratory setting.

The literature therefore does not suggest a hypothesis regarding differences between the actual assessment of men and women. It does however suggest that the expressions of confidence of women in their assessment of the performance and position of the reporting entities will be lower than those of men. This is particularly so in the light of the ambiguous context described in chapter 7: that 'correct answers' are unsought and that little feedback is given in this research. Furthermore, it may be hypothesised (after Deaux and Farris, 1977) that this difference will be evident even when their assessments are similar.

Tables 11.10 to 11.14 outline the research results categorised by gender. It may be noted that, in the case of the assessment of position and performance, the assessments of males and females are broadly similar. No consistent pattern emerges in the assessment of position. The assessment of the position of the stable company by females is, however, significantly higher (at a 95% level of confidence) than those of the males. There is a similar difference (though not as significant) in the context of performance. The reason for this is unclear, although perhaps it arises from the observation that STA

is one of the entities concerning which there is most disagreement (see chapters 8 to 10). There is no significant difference in the assessment of performance although the females' assessment of the performance of the performance of the reporting entities is consistently higher and higher overall than that of males.

The differences in the expressions of confidence are more marked. The expressions of confidence by females are consistently lower than those of males in the case of both position and performance. They are significantly lower (at a 95% level of confidence) in the case of the performance and position of the stable (STA) and no debt (ND) reporting entities. These findings are consistent with those in chapter 8 in particular where the same reporting entities manifested significant differences in the assessments of the experimental subjects given the disclosure of uncertainty. More pertinently, however, these findings strongly support those elsewhere in the literature outlined above. This is the case even where the assessments of male and female are similar confirming the findings of Fennema and Sherman (1978) and Zukerman (1987) that 'even when female students achieve as well or better than their male counterparts, they tend to underestimate themselves'. (in Lundeberg *et. al.*, 1994, p. 114). Lundeberg *et. al.* (1994, p. 120) comment that 'perhaps the question that should be pursued is not why women are less confident than men, but why in our culture we hesitate to recognise and admit uncertainty'. Such a question underpins the rationale of this research in the culture of accounting which introduced this area (chapters 2 and 3).

Table 11.10: Mean assessment of position: gender.

	GENDER		
	Male	**% change**	**Female**
	(n= 123)		*(n=89)*
High debt (HD)	42.2	-4%	40.5
Declining (DEC)	47.1	+4%	49.2
Stability (STA)	57.9	+9%#	63.2
High growth (HG)	55.6	+2%	56.5
No debt (ND)	74.4	-2%	72.6
	55.4	**+2%**	**56.4**

 # = significant at a 95% level of confidence.

Table 11.11: Mean assessment of performance: gender.

	GENDER		
	Male	**% change**	**Female**
	(n= 123)		*(n=89)*
High debt (HD)	43.6	---	43.6
Declining (DEC)	44.0	+4%	45.6
Stability (STA)	56.3	+7%	60.0
High growth (HG)	61.2	+5%	64.5
No debt (ND)	67.2	+1%	68.0
	54.5	**+3%**	**56.3**

Table 11.12: Mean confidence in assessment of position: gender.

	GENDER		
	Male	**% change**	**Female**
	(n= 123)		*(n=89)*
High debt (HD)	66.3	-2%	64.9
Declining (DEC)	66.0	-5%	62.8
Stability (STA)	68.0	-7%#	63.0
High growth (HG)	67.1	-4%	64.4
No debt (ND)	71.4	-7%#	66.6
	67.8	**-5%**	**64.3**

 # = significant at a 95% level of confidence.

Table 11.13: Mean confidence in assessment of performance: gender.

	GENDER		
	Male	**% change**	**Female**
	(n= 123)		*(n=89)*
High debt (HD)	64.4	-2%	63.3
Declining (DEC)	65.5	-3%	63.4
Stability (STA)	66.7	-8%#	61.4
High growth (HG)	66.0	-4%	63.6
No debt (ND)	70.8	-8%#	64.8
	64.7	**-2%**	**63.3**

 # = significant at a 95% level of confidence.

11.3.2 Aptitude

Several reviews of judgemental research in accounting (e.g. Joyce, 1989; Ashton, 1996) have commented on the growing need to assess the impact of ability on decision-making. As Schneider and Lopes (1986) comment in a broader context, 'who . . . may suggest why?' The motivation for such suggestions involve using an understanding of the effects of different factors on decision-making to improve decision-making. As explained in chapter 7, the research instrument in this particular research does not indicate or contain a 'correct' answer. Therefore, the discussion that follows does not set out to suggest that ability or aptitude, as measured by the aptitude test in this experiment, leads to better answers. It merely explores whether it leads to different answers and differing expressions of confidence.

Tables 11.14 to 11.17 set out the mean assessments of performance and position of the reporting entities by the different groups defined earlier in the chapter and their expressions of confidence in those assessments. The results indicate that the assessments and expressions of confidence generally increase with aptitude. There are some exceptions to this overall trend particularly in the assessment of position of HD by those with high aptitude (Table 11.14). The rankings of the position and performance of the reporting entities remain broadly the same between the categories. Again the exception is the case of HD where those with high aptitude appear to have differentiated quite markedly between the performance and position of HD. The high aptitude group assess the performance of HD as significantly healthier than do the other groups having assessed its position markedly lower relative to the other aptitude groups. As such, the high aptitude group assesses the performance of HD as marginally higher than DEC. The profits of the latter are higher, but declining. This may indicate a greater attention to potential future trends in the assessment of performance by the high aptitude group.

On the other hand, the low aptitude group assesses the performance of DEC as significantly lower than the other groups. This is in line with the overall trend towards lower assessment of position and (less consistently) performance by the low aptitude group. The lower assessment of position is mirrored (and perhaps driven) by lower confidence regarding these assessments. The expressions of confidence concerning the performance of the reporting entities is also mirrored somewhat in the assessment of performance. In the case of aptitude, therefore, it would appear that lower aptitude effects confidence

in the assessment of position primarily and that that confidence also effects the assessment of position and performance, injecting a measure of caution where confidence is diminished.

Table 11.14: Mean assessment of position: aptitude.

	APTITUDE SCORE				
	Low	**% change**	**Mode**	**% change**	**High**
	(Score <3/5)		*(Score 3/5)*		*(Scor e>3/5)*
	(n=75)		*(n=102)*		*(n=104)*
High debt (HD)	41.7	+3%	43.0	-8%	39.7
Declining (DEC)	43.1	+9%	47.1	+3%	48.5
Stability (STA)	55.4	+8%	59.6	+2%	60.5
High growth (HG)	52.6	+7%	56.5	-2%	55.2
No debt (ND)	68.4	+5%	71.7	+5%	75.5
	52.2	**+6%**	**55.6**	**—**	**55.9**

Table 11.15: Mean assessment of performance: aptitude.

	APTITUDE SCORE				
	Low	**% change**	**Mode**	**% change**	**High**
	(Score <3/5)		*(Score 3/5)*		*(Score >3/5)*
	(n=75)		*(n=102)*		*(n=104)*
High debt (HD)	44.2	-8%	40.7	+13%	45.9
Declining (DEC)	38.2	+18%#	45.3	-2%	44.2
Stability (STA)	55.2	+5%	58.0	-1%	57.6
High growth (HG)	61.1	—	60.9	+5%	63.9
No debt (ND)	67.7	-3%	66.0	+5%	69.4
	53.3	**+2%**	**54.2**	**+4%**	**56.2**

 # = significant at a 95% level of confidence.

Table 11.16: Mean expression of confidence in assessment of position: aptitude.

	APTITUDE SCORE				
	Low	**% change**	**Mode**	**% change**	**High**
	(Score <3/5)		*(Score 3/5)*		*(Score >3/5)*
	(n=75)		*(n=102)*		*(n=104)*
High debt (HD)	63.0	+6%	66.7	-2%	65.1
Declining (DEC)	61.5	+5%	64.7	—	65.1
Stability (STA)	65.3	-1%	64.4	+5%	67.7
High growth (HG)	64.7	+1%	65.6	+2%	66.7
No debt (ND)	64.5	+6%	68.6	+3%	70.6
	63.8	**+3%**	**66.0**	**+2%**	**67.0**

 # = significant at a 95% level of confidence.

Table 11.17: Mean expression of confidence in assessment of performance: aptitude.

	APTITUDE SCORE				
	Low	**% change**	**Mode**	**% change**	**High**
	(Score <3/5)		*(Score 3/5)*		*(Score >3/5)*
	(n=75)		*(n=102)*		*(n=103)*
High debt (HD)	61.8	—	61.9	+7%	66.2
Declining (DEC)	61.5	+5%	64.4	+1%	65.3
Stability (STA)	65.0	-2%	63.5	+4%	65.9
High growth (HG)	64.2	—	63.9	+4%	66.4
No debt (ND)	63.3	+3%	65.4	+8%#	70.8
	63.2	—	**63.8**	**+5%**	**66.9**

 # = significant at a 95% level of confidence.

Generally aptitude does not differ significantly based on the other characteristics of the experimental subjects. The most marked differences are between those in employment (mean score = 3.24) and those not in employment (mean score = 2.96) and between those attending (mean score = 3.0) and those not attending (mean score = 3.32) a course of study at DCU. Both of these differences are significant at a 95% level of confidence indicating, as suggested in chapter 7, that the aptitude test may have captured elements of the 'real' environment to a greater extent than the 'classroom' environment. There were no other significant differences in the aptitude scores recorded.

11.3.3 Experience

This section examines the effect of experience on the assessments and confidence of subjects. It is not intended to define experience as a single factor or observation or to filter a number of factors into one variable termed 'experience'. Experience will be defined as a number of separate characteristics which, together, present a picture of the effect of experience on the assessments and expressions of confidence of subjects. Experience in this instance may be classified as work experience and educational experience. The former may be defined by a number of factors including, for example, sector of employment, use of financial statements and years in employment. Educational experience includes attendance at a course of study and whether the subject is graduate or non-graduate.

The discussion that follows will focus only on those areas where there are adequate numbers to render any differences between subjects based on these characteristics meaningful. These areas comprise (under work experience) employment, use of financial statements as part of that employment and area of employment. With regard to educational experience, they comprise the issue of whether the subject is a graduate or not, whether he / she is currently attending a course of study and whether that course of study is a post-graduate or undergraduate course. Year of study will not be considered as all the subjects who were attending a course of study at the time of the experiments were in the third and final year of a full-time undergraduate course or in post-graduate programmes of one (full-time) or two years (part-time) duration. Any differences between these groups will be adequately captured by the undergraduate / post-graduate dichotomy.

11.3.3.1 Employment

Tables 11.18 to 11.21 in the appendix to this chapter present the experimental results categorised between subjects in employment and not in employment and, of those in employment, those using (not using) financial statements as part of that employment. The assessment of position and performance of those not in employment is generally higher than those in employment and significantly higher (at a 95% and 90% level of confidence) in the case of a number of reporting entities (HD and DEC). Conversely, the level of confidence expressed by the subjects not in employment is consistently and (in some instances) significantly lower than the level of confidence expressed by those in employment.

By way of explanation of these findings, the prior expectations of position and performance of reporting entities may differ between those in employment and those not in employment. In particular, the experience and, hence, expectations of the extent of failing firms in particular may differ. This would be particularly true of HD and DEC, both firms whose position and performance are assessed as marginal by both groups. For example, the effect of such expectations is advanced by Lev (1974, p. 141) as one of the weaknesses of a study by Beaver (1966) regarding corporate failure as, he argues, prior expectations colour judgement regarding corporate failure.

Of those in employment, the mean assessment of position of those who do not use financial statements is lower overall and significantly lower in the case of HD and HG than those who do use financial statements as part of their employment. On the other hand, the assessment of performance differs significantly only with respect to STA and in this instance, the assessment of those not using financial statements is significantly higher. There is little difference between the confidence expressed by these two groups in their assessments.

These findings can be further explored by observing the nature of the employment of those in employment: those who do not use financial statements are predominantly in sectors other than accounting firms (96% of those subjects employed in accounting firms use financial statements as part of their employment against 66% in the other categories).

Further analysis of those in employment is presented in Tables 11.22 to 11.25 in the appendix. These are classified as those working in accounting firms (48), those in financial institutions (37) and those working elsewhere (36, mainly in manufacturing and service organisations). Those working in financial institutions generally (with the exception of the position of STA) assess the performance and position of the reporting entities less favourably than those working in accounting firms. This is significant in the case of the position of HD and DEC and the performance of STA. In contrast, those working in financial institutions view STA's position as significantly better than those working in accounting firms. This appears to be primarily because those working in financial institutions distinguish sharply between the position and performance of STA viewing its position very favourably (ranked third) relative to its performance (ranked fourth). This would appear to contradict the view proposed by Ronen and Sadan (1981) and Dye (1988) regarding the importance of growth in the assessment of performance and confirm the findings of chapter 8 where stable growth is devalued. These findings suggest that this

may be particularly so in the case of those working in financial institutions. There is no significant or consistent difference between the confidence of those in financial institutions and those in accounting firms.

There are further numerous and significant differences between the assessments of those employed in financial institutions and those employed elsewhere. Differences in the assessments of performance and position are quite inconsistent and significant in the case of the position of HD and STA and the performance of STA. Once more differences or disagreement between the employment categories appear to be focused on HD and STA. There also appear to be significant differences between those employed in accounting firms and others with regard to the positions of DEC (-13%) and HG (-12%). These findings suggest that, as discussed in chapters 4 and 6, the perception of the reality of a reporting entity's position and performance can differ significantly given the same information (Hines, 1988) and, furthermore, that that reality is strongly informed by the background and experience of the readers of the financial statements.

The findings are consistent with the findings of Firth (1978, p. 69) who also found that there were significant differences between the assessments of 'finance directors and auditors, on the one hand, and financial analysts and bank loan officers on the other'. This may be for a number of reasons. First, as Chandra (1974) commented (p. 741) 'accountants generally do not value information for equity investment decisions the same way as security analysts do'. He suggests that this may be due to a lack of communication between the two groups, a time lag between the identification of needs by analysts and their adoption by accountants and a (p. 69) 'tendency by accountants to adhere to the established order'.

Second, as Chesley (1986) points out the interpretation of words such as likely by preparers and users of financial statements may differ. Chesley and Wier (1985) found that these differences persisted between employment groups. In the case of their research, these groups comprised the accounting and legal professions. Hence, the understanding of remote and the perception of its subsequent clarification may differ between those employed in accounting firms and those in financial institutions.

A more fundamental reason in this case, however, may be that the assessment of performance and position carries a different meaning for both groups. Those in financial institutions may be interested in

such assessments as a means to decide investment and / or loan decisions. Those in accounting firms (mainly involved in auditing) may perform such assessments as part of the consideration of audit risk, analytical review and going concern. Both the conceptual tests and the threshold of materiality is different in both cases, with that for loan commitment or investment being lower (more sensitive) than a going concern or analytical review threshold. By this logic, those employed in financial institutions are more likely to downgrade reporting entities with high debt or declining growth relative to those in accounting firms. The one exception is the case of STA where those employed in financial institutions appear to value stability relative to those in accounting firms who may view such stability as a signal of income-smoothing.

The expression of confidence of those employed in employment other than in accounting firms and financial institutions is consistently and in some instances significantly lower than the confidence expressed by those employed in accounting firms and financial institutions. This is influenced to a certain extent by the extent to which those in financial institutions and accounting firms are familiar with accounting information, particularly with additional conceptual information such as that disclosed in these experiments. O'Connor (1989, p. 157) found evidence that 'familiarity with the topic of interest' provides 'some insight into the variation in calibration of expressions of confidence in the accuracy of human judgement'. As argued by Bradley (1996) 'familiarity breeds confidence'. Such views are supported by Mautz (1990) in a study concerning inflation-adjusted disclosures (also discussed in chapter 4) when he suggests (p. 289) that lower confidence may result from unfamiliarity with the information disclosed. Mautz comments that such a suggestion requires further research. To the extent that this research represents a limited, if incidental, extension of Mautz's research and that of O'Connor, it offers some support for such suggestions regarding the role of familiarity in forming confidence.

Part of the consideration of experience includes age. Tables 11.26 to 11.29 in the appendix present the assessments and expressions of confidence of the experimental subjects classified by age. There appears to be little discernible or significant pattern or difference across the age groups. Furthermore, the numbers involved categorised by age are highly-skewed (with over 60% of the subjects between 21 and 25 years of age). There appears little pattern and little trend based on age. Age is therefore considered only to the extent that it appears to have little influence and to the extent that more detailed consideration does not add value to the consideration of experience.

11.3.3.2 Education

The use of student subjects in experiments concerning judgments in accounting has been discussed by several authors (e.g. Dickhaut, Livingstone and Watson, 1972; Abdel-Khalik, 1974 and Ashton and Kramer, 1980). As outlined in chapter 5, such discussions appear to discourage the use of student subjects. As studies of judgment in accounting are context specific, the literature suggests in particular that the judgment processes and values of students do not replicate or represent those of, for example, auditors, accountants, bank lenders or investment analysts.

Nevertheless in a wide-ranging survey of the literature, Snowball (1986) found that students participated in 70% of the sample studies (published in particular in *The Accounting Review, The Journal of Accounting Research* and *Accounting, Organizations and Society*). The reasons for such findings are explored in Section 5.4.3. This chapter, however, discusses whether the decision outcomes (as opposed to the processes) of participants differ based on their educational status. In particular, differences, if any, in the assessments and expressions of confidence of those attending courses of study in DCU will be compared with those who are not (Tables 11.30 to 11.33 in the appendix). A further exploration will consider differences between graduates and non-graduates in the same context (Tables 11.34 to 11.37 in the appendix). The existence (or not) of such differences may be interesting in the light of Lundeberg *et al.*'s (1994) tentative finding that graduates were generally more confident than undergraduates.

As may be noted in Tables 11.30, 11.31, 11.32 and 11.33, the only significant difference between the assessment of performance and position of the reporting entities is with respect to HD. Such a difference (among others) was also observed when comparing those in employment with those not in employment (Table 11.18). A substantial percentage of (54%) of those attending a course of study in DCU were not in employment. The explanations for the difference in assessment of the position of HD may therefore be similar to that offered in the context of the employment of the subjects (i.e. a greater awareness by those in employment of the implications of high debt). On an overall basis, however, employment status rather than educational status would appear to create differences between the *assessments* of subjects to a greater and more numerous extent than educational status.

More consistent and significant differences may be found in the *confidence* expressed by the subjects based on their educational status. Those not currently attending a course of study in DCU expressed a consistently and significantly higher confidence in their assessments than those who are attending a course of study at DCU. Further, educational status is a more significant and consistent 'driver' of confidence than any of the other variables discussed in this research.

Further exploration of this finding through Tables 11.34 to 11.37 embraces whether the subjects are graduates: all of those not attending a course of study at DCU are graduates while 46% of those attending a course of study at DCU are graduates. Intuitively, it may be that graduation and / or completion of a course of study may create confidence and that this would explain some of the differences observed between those attending / not attending a course of study. While Tables 11.36 and 11.37 illustrate consistent differences between the confidence of graduates / non-graduates, these differences are not significant and not as significant as those found based on course attendance. Furthermore, a further breakdown of the composition of those attending courses of study between those who are graduates and non-graduates (in Tables 11.38 and 11.39 in the appendix) reveals no significant difference in confidence between graduates and non-graduates who are attending a course of study.

It would therefore appear that the main influence on confidence in this context is course attendance and not graduation. In other words, the influence of *attendance* outweighs that of *graduation*. Attendance at a course of study diminishes confidence even among those who have already graduated. Hence while the literature is largely unsupported concerning differences between the decision outputs of student / non-student subjects, there is a significant difference between the confidence felt by student and non-student subjects in those decision outputs.

11.4 CONCLUSION

This chapter set out to explore differing influences on the assessments of the reporting entities and the expressions of confidence. These influences were based on the characteristics of the experimental subjects as gleaned in the research instrument. The chapter discussed these characteristics in three broad categories in Sections 11.3.1, 11.3.2 and 11.3.3 resectively: gender, aptitude (as measured by the

research instrument) and experience. The last of these comprised an amalgam of characteristics including category of employment, use of financial statements and current educational status.

A number of these factors proved influential with regard to the overall assessments and expressions of confidence of experimental subjects. With respect to gender, females were significantly and consistently less confident than their male counterparts. This was consistent with the other studies which found women generally less confident than men. This difference in confidence concerned assessments which did not differ significantly. Hence, although the assessments of position and performance by men and women were broadly similar, nevertheless, women were less confident of those assessments.

Aptitude did not appear to be a consistently significant influence on assessment or confidence. Those with a higher aptitude appeared more confident in their assessments (although not significantly so). This is intuitive and is also consistent with the literature in the area of ability and its influence on confidence. As noted, several items were considered in the exploration of experience. The most marked influence appeared to be, first, the effect of employment category on assessments and, secondly, the effect of course attendance on confidence. The chapter discussed the reasons for such findings in the light of this and other research.

There were a number of other, more isolated differences, between the categories of subjects taking part in the research. These appeared to revolve in particular around the reporting entities where there was disagreement based on the disclosures of information which was at the heart of the research. The following chapter summarises the implications of this particular finding with regard to differing reporting entities. In broad terms, the implications of this chapter appear to confirm the comments of Dermer (1973, p. 512) that 'it appears that information usage is an idiosyncratic or subjectively determined process', and that that determination is distilled by gender and elements of experience.

Appendix to Chapter 11

Tables 11.18 to 11.39

Table 11.18: Mean assessment of position: those not in employment / in employment / using financial statements.

				In employment		
	Not in employment		**In employment**	**Not use FS**		**Use FS**
	(n=91)	*% change*	*(n=124)*	*(n=26)*	*% change*	*(n=98)*
High debt (HD)	44.7	-13%#	39.0	31.8	+28%#	40.9
Declining (DEC)	50.7	-9%#	46.0	46.0	---	46.0
Stability (STA)	62.1	-6%@	58.6	59.0	-1%	58.5
High growth (HG)	55.5	+1%	56.3	40.8	+48%#	60.4
No debt (ND)	73.8	---	73.5	71.0	+5%	74.2
	57.4	**-5%**	**54.7**	**49.7**	**+13%**	**56.0**

= significant at a 95% level of confidence.

@= significant at a 90% level of confidence.

Table 11.19: Mean assessment of performance: those not in employment / in employment / using financial statements.

					In employment	
	Not in employment		**In employment**	**Not use FS**		**Use FS**
	(n=91)	*% change*	*(n=124)*	*(n=26)*	*% change*	*(n=98)*
High debt (HD)	45.4	-7%	42.3	43.5	-3%	42.0
Declining (DEC)	48.8	-14%#	41.8	49.0	-19%#	39.9
Stability (STA)	59.5	-2%	58.5	56.0	+6%	59.2
High growth (HG)	61.7	+2%	63.2	59.6	+8%	64.2
No debt (ND)	66.3	+3%	68.6	71.8	-6%	67.7
	56.3	**-2%**	**54.9**	**56.0**	**-3%**	**54.6**

= significant at a 95% level of confidence.

@= significant at a 90% level of confidence.

Table 11.20: Mean expression of confidence in assessment of position: those not in employment / in employment / using financial statements.

			In employment			
	Not in employment		**In employment**	**Not use FS**		**Use FS**
	(n=91)	*% change*	*(n=124)*	*(n=26)*	*% change*	*(n=98)*
High debt (HD)	62.1	+10%#	68.4	70.6	-4%	67.8
Declining (DEC)	62.4	+6%@	66.3	65.9	+1%	66.4
Stability (STA)	64.0	+5%	67.3	64.2	+6%	68.1
High growth (HG)	64.0	+5%	67.4	69.3	-3%	66.9
No debt (ND)	68.2	+3%	70.3	71.9	-3%	69.9
	64.1	**+6%**	**67.9**	**68.4**	**—**	**67.8**

= significant at a 95% level of confidence.

@= significant at a 90% level of confidence.

Table 11.21: Mean expression of confidence in assessment of performance: those not in employment / in employment/ using financial statements

				In employment		
	Not in employment		**In employment**	**Not use FS**		**Use FS**
	(n=91)	*% change*	*(n=124)*	*(n=26)*	*% change*	*(n=98)*
High debt (HD)	59.9	+12%#	66.9	68.8	-3%	66.5
Declining (DEC)	62.2	+7%@	66.4	65.4	+2%	66.7
Stability (STA)	60.7	+11%#	67.3	67.4	-1%	66.7
High growth (HG)	62.7	+6%#	66.7	66.1	+1%	66.9
No debt (ND)	66.5	+5%	69.5	68.8	+1%	69.7
	62.4	**+8%**	**67.4**	**67.3**	**---**	**67.3**

= significant at a 95% level of confidence.

@= significant at a 90% level of confidence.

Table 11.22: Mean assessment of position by employment category.

	EMPLOYMENT CATEGORY				
	Accounting	**<%>**	**Financial Institution**	**<%>**	**Other**
	(n=48)		*(n=37)*		*(n=38)*
High debt (HD)	44.7	-19%#	36.2	+11%#	40.1
Declining (DEC)	49.5	-11%#	44.0	-2%	43.4
Stability (STA)	57.5	+12%#	64.5	-16%#	54.4
High growth (HG)	59.5	-5%	56.2	-7%	52.5
No debt (ND)	74.0	-1%	73.1	---	73.5
	57.0	-4%	54.8	-4%	52.8

 # = significant at a 95% level of confidence.

Table 11.23: Mean assessment of performance by category of employment.

	EMPLOYMENT CATEGORY				
	Accounting	**<%>**	**Financial Institution**	**<%>**	**Other**
	(n=48)		*(n=37)*		*(n=38)*
High debt (HD)	42.4	-9%	38.6	+19%#	46.0
Declining (DEC)	44.8	-12%#	39.3	+3%	40.3
Stability (STA)	55.7	+4%	58.1	-3%	56.4
High growth (HG)	64.4	-3%	62.2	+1%	62.9
No debt (ND)	69.5	-5%	66.3	+4%	69.2
	55.4	-5%	52.9	+4%	55.0

 # = significant at a 95% level of confidence.

Table 11.24: Mean expression of confidence of assessment of position by category of employment.

	EMPLOYMENT CATEGORY				
	Accounting	**<%>**	**Financial Institution**	**<%>**	**Other**
	(n=48)		*(n=37)*		*(n=38)*
High debt (HD)	69.3	-1%	68.6	-2%	67.1
Declining (DEC)	67.1	+3%	68.8	-8%	63.1
Stability (STA)	69.0	-3%	66.8	-1%	65.8
High growth (HG)	67.8	+5%	71.1	-11%#	63.3
No debt (ND)	74.0	-1%	73.1	----	73.5
	69.4	---	69.7	-5%	66.6

Table 11.25: Mean expression of confidence of assessment of performance by category of employment.

	EMPLOYMENT CATEGORY				
	Accounting	**<%>**	**Financial Institution**	**<%>**	**Other**
	(n=48)		*(n=37)*		*(n=38)*
High debt (HD)	69.2	-5%	65.4	---	65.7
Declining (DEC)	68.1	---	68.3	-8%	62.5
Stability (STA)	68.5	+2%	69.6	-9%	63.4
High growth (HG)	67.1	+1%	67.6	-3%	65.5
No debt (ND)	69.0	+3%	71.3	-4%	68.4
	68.4	---	68.4	-5%	65.1

Table 11.26: Mean assessment of position: age

	AGE					
	<=20	**21-25**	**26-30**	**31-35**	**36-40**	**>40**
	(n=44)	*(n=130)*	*(n=24)*	*(n=6)*	*(n=6)*	*(n=2)*
High debt (HD)	47.5	38.5	42.7	66.7	40.0	15.0
Declining (DEC)	51.1	47.7	48.8	33.8	41.7	65.0
Stability (STA)	60.7	60.9	57.5	46.2	70.8	50.0
High growth (HG)	55.7	57.2	51.7	52.5	58.3	40.0
No debt (ND)	71.4	74.7	73.3	62.5	85.8	65.0
	57.3	55.8	54.8	52.3	59.3	47.0

Table 11.27: Mean assessment of performance: age.

	AGE					
	<=20	**21-25**	**26-30**	**31-35**	**36-40**	**>40**
	(n=44)	*(n=130)*	*(n=24)*	*(n=6)*	*(n=6)*	*(n=2)*
High debt (HD)	47.7	42.3	39.6	61.7	41.7	40.0
Declining (DEC)	46.9	45.3	43.0	36.3	35.0	40.0
Stability (STA)	58.7	58.6	52.9	51.3	66.7	40.0
High growth (HG)	61.1	62.7	61.7	65.0	67.5	90.0
No debt (ND)	65.2	68.6	68.1	58.8	75.0	40.0
	55.9	55.5	53.1	54.6	57.2	50.0

Table 11.28: Mean assessment of confidence in position: age.

	AGE					
	<=20	**21-25**	**26-30**	**31-35**	**36-40**	**>40**
	(n=44)	*(n=130)*	*(n=24)*	*(n=6)*	*(n=6)*	*(n=2)*
High debt (HD)	59.9	67.2	66.0	75.0	56.7	80.0
Declining (DEC)	60.8	66.0	64.8	57.5	70.8	75.0
Stability (STA)	61.0	67.8	64.6	56.3	80.0	60.0
High growth (HG)	62.3	66.2	70.6	61.3	78.3	60.0
No debt (ND)	65.5	70.0	72.7	61.3	76.7	85.0
	61.9	67.4	67.7	62.3	72.5	72.0

Table 11.29: Mean assessment of confidence in performance: age.

	AGE					
	<=20 21-25	**26-30**	**31-35**	**36-40**	**>40**	
	(n=44)	*(n=130)*	*(n=24)*	*(n=6)*	*(n=6)*	*(n=1)*
High debt (HD)	58.4	65.8	61.5	76.3	60.0	50.0
Declining (DEC)	60.3	66.4	66.5	57.5	64.2	40.0
Stability (STA)	60.5	64.8	66.5	68.8	78.3	40.0
High growth (HG)	62.5	64.7	69.6	63.8	72.5	70.0
No debt (ND)	65.3	68.3	70.4	70.0	76.7	70.0
	61.4	66.0	66.9	67.3	70.3	54.0

Table 11.30: Mean assessment of position: course attendance.

	COURSE ATTENDANCE		
	Yes	**% change**	**No**
	(n=129)		*(n=83)*
High debt (HD)	43.8	-13%#	37.9
Declining (DEC)	48.3	-2%	47.5
Stability (STA)	59.8	+1%	60.6
High growth (HG)	54.8	+5%	57.8
No debt (ND)	74.0	-1%	73.1
	56.1	**-1%**	**55.4**

#= significant at a 95% level of confidence.

Table 11.31: Mean assessment of performance: course attendance.

	COURSE ATTENDANCE		
	Yes	**% change**	**No**
	(n=129)		*(n=83)*
High debt (HD)	45.2	-9%	41.0
Declining (DEC)	45.7	-5%	43.2
Stability (STA)	57.1	+3%	59.0
High growth (HG)	62.7	----	62.4
No debt (ND)	67.5	----	67.7
	55.6	**-2%**	**54.7**

= significant at a 95% level of confidence.

Table 11.32: Mean expression of confidence in assessment of position: course attendance.

	COURSE ATTENDANCE		
	Yes	**% change**	**No**
	(n=129)		*(n=83)*
High debt (HD)	62.5	+13%#	70.7
Declining (DEC)	62.0	+11%#	68.8
Stability (STA)	63.3	+11%#	70.0
High growth (HG)	63.3	+11%#	70.0
No debt (ND)	68.4	+4%	71.0
	63.9	**+10%**	**70.1**

= significant at a 95% level of confidence.

Table 11.33: Mean expression of confidence in assessment of performance: course attendance.

	COURSE ATTENDANCE		
	Yes	**% change**	**No**
	(n=129)		*(n=83)*
High debt (HD)	60.4	+15%#	69.4
Declining (DEC)	61.5	+13%#	69.4
Stability (STA)	60.1	+18%#	71.1
High growth (HG)	62.6	+14%#	68.8
No debt (ND)	67.4	+3%	69.6
	62.4	**+12%**	**69.7**

= significant at a 95% level of confidence.

Table 11.34: Mean assessment of position: graduate / non-graduate.

	GRADUATE		
	Yes	**% change**	**No**
	(n=145)		*(n=70)*
High debt (HD)	38.9	+19%#	46.4
Declining(DEC)	46.8	+7%	50.3
Stability (STA)	59.5	+3%	61.3
High growth (HG)	57.2	-6%	53.6
No debt (ND)	73.6	----	73.7
	55.2	**+3%**	**57.1**

= significant at a 95% level of confidence.

Table 11.35: Mean assessment of performance: graduate / non-graduate.

	GRADUATE		
	Yes	**% change**	**No**
	(n=145)		*(n=70)*
High debt (HD)	41.2	+17%#	48.4
Declining (DEC)	43.4	+9%	47.4
Stability (STA)	58.7	-4%	56.2
High growth (HG)	63.7	-5%	60.4
No debt (ND)	67.0	+3%	68.7
	54.8	**+3%**	**56.2**

= significant at a 95% level of confidence.

Table 11.36: Mean expression of confidence in assessment of position: graduate / non-graduate.

	GRADUATE		
	Yes	**% change**	**No**
	(n=145)		*(n=70)*
High debt (HD)	66.9	-5%	63.3
Declining (DEC)	65.4	-3%	63.3
Stability (STA)	66.9	-4%	63.9
High growth (HG)	66.7	-3%	64.4
No debt (ND)	70.1	-3%	68.1
	67.2	**-4%**	**64.6**

= significant at a 95% level of confidence.

Table 11.37: Mean expression of confidence in assessment of performance: graduate / non-graduate

	GRADUATE		
	Yes	**% change**	**No**
	(n=145)		*(n=70)*
High debt (HD)	65.1	-5%	61.6
Declining (DEC)	65.4	-3%	63.2
Stability (STA)	65.3	-4%	62.9
High growth (HG)	65.3	-1%	64.4
No debt (ND)	69.0	-3%	66.7
	66.0	**-3%**	**63.8**

Table 11.38: Mean expression of confidence in assessment of position: graduate / non-graduate attending a course of study.

	GRADUATE ATTENDING A COURSE OF STUDY		
	Yes	**% change**	**No**
	(n=61)		*(n=68)*
High debt (HD)	62.3	---	62.6
Declining(DEC)	60.9	+3%	62.9
Stability (STA)	63.6	-1%	63.0
High growth (HG)	63.1	+1%	63.5
No debt (ND)	69.4	-3%	67.4
	63.9	**—**	**63.9**

Table 11.39: Mean expression of confidence in assessment of performance: graduate / non-graduate attending a course of study.

	GRADUATE ATTENDING A COURSE OF STUDY		
	Yes	**% change**	**No**
	(n=61)		*(n=68)*
High debt (HD)	59.5	+3%	61.1
Declining(DEC)	60.7	+2%	62.2
Stability (STA)	58.2	+6%	61.9
High growth (HG)	61.5	+3%	63.5
No debt (ND)	68.8	-4%	66.0
	61.7	**+2%**	**62.9**

CHAPTER 12

CONCLUSION

12.1 INTRODUCTION

This thesis explored the implications of uncertainty for financial reporting and, in particular, how uncertainty might be disclosed in financial statements. In doing so, it drew on suggestions or requirements currently in the domain of financial accounting standard-setting in the UK and Ireland and in the US. As such the conclusions of the thesis have implications for policy-setting in the realm of accounting standards. This chapter, the concluding chapter of the thesis, has among its themes the identification and exploration of those implications.

As noted in chapter 1, the thesis evolved from a consideration of the relevance and importance of uncertainty to financial reporting (in chapter 2) through an exploration of the literature in the areas of decision-making and accounting (in chapters 3 and 4) to the concretised of the research (in chapters 5, 6 and 7) and a discussion of the research results (in chapters 8 to 11).

This chapter is in three main sections reflecting the development of the thesis. Section 12.2 outlines the development of the conceptual background to the research. In particular, this section discusses the main contribution of chapters 2 to 4 to the evolution of the central tenets of the thesis. These central tenets are implemented in chapters 5 to 7. Section 12.3 addresses the limitations raised by the manner of that implementation. From such limitations grow some further research opportunities. These research opportunities are also explored in this section.

The concepts and framework of the research are moulded substantially by contemporary suggestions in accounting policy and the research is focused to a great extent by those suggestions. As a result, the conceptual framework of the research lays the foundations for the consideration of uncertainty in the context of accounting choice and policy-making. The concluding section, Section 12.4 explores the main implications of the thesis findings for accounting policy and for the development of accounting practice. These implications are discussed in the context of the nature of financial statements and the disclosure of uncertainty in such financial statements.

12.2 CONCEPTUAL BACKGROUND

Chapter 2 argued that uncertainty is central to financial reporting. This is particularly so given a view of financial reporting which increasingly portrays the objectives of financial statements as the provision of 'information about the financial position, performance and financial adaptability of an enterprise that is useful to a wide range of users in making economic decisions' (ASB, 1995b, p. 35). Users are characterised as seeking 'economic relevance' (Tweedie and Whittington, 1990). Such relevance is fashioned in an increasingly uncertain world.

The chapter then went on to identify the needs of the wide range of users identified by the ASB in its draft *Statement of Principles* (ASB, 1995b). A common component of such a consideration is that users' needs are influenced, to varying degrees and in different contexts, by uncertainty. Commenting that while financial statements existed because of uncertainty they were also constrained by uncertainty, a number of suggestions were then explored regarding how financial statements might better reflect uncertainty. These suggestions were contemporary and historical, cautious and radical, pragmatic and conceptual. The research drew on more contemporary, pragmatic approaches to the disclosure of uncertainty to make concrete the examination of the effects of the disclosure of uncertainty on decision-making. To be true to their objectives, financial statements, it was argued, need to include an indication of the uncertain world.

Chapter 3 traced the development of theories of decision-making under uncertainty. It drew, in particular, on more recent theories such as those of Einhorn and Hogarth (1986) and Kahneman and Tversky (1979) to illuminate the influence of uncertain contexts on the decision-making of

individuals. These theories evolved in the context of individual decision-making. Such theories introduced, in particular, the need for 'closure' or inference in the face of incomplete information. This need became a foundation of some of the hypotheses (particularly concerning the variability of assessments) in later parts of the thesis. The institutional context of decision-making was also considered before the chapter concluded by emphasising the importance of uncertainty to decision-making and the potential influences of information regarding uncertainty on decision-making.

Chapter 4 explored the literature regarding decision-making in financial accounting. This exploration was distinct from that in chapter 2, which considered alternative approaches to the disclosure of uncertainty. Chapter 4 began, however, by drawing on chapter 2 to develop a specific, narrower framework of disclosure. This framework comprised on the one hand the disclosure of the uncertain nature of financial statements and, on the other, the increased and increasing disclosure of specific estimates within the financial statements.

Such estimates constitute two elements: the uncertainty of occurrence and the uncertainty of outcome. The research sought to examine disclosure of more information concerning these estimates. Furthermore, drawing on conventions concerning the evidence required to recognise assets and liabilities (for examples that the recognition of assets requires more evidence than the estimation of liabilities (ASB, 1995a, 1995b and 1997b), part of the research objective was to consider any differences in the assessments of decision-makers in the light of an uncertain asset (potentially obsolete stock) and, separately, an uncertain liability (potential crystallisation of a guarantee).

The chapter concluded by identifying the characteristics of the thesis which rendered it unique: for example, its contemporary, policy focus, its consideration of differences in the perceptions of uncertain assets and liabilities, and its consideration of what chapter 3 identified as 'intersubjective reality'.

Chapters 3 and 4 helped in the identification of a behavioural, experimental approach to the research in chapter 5. The identification of the framework within which the research question would be approached allowed the establishment of specific research hypotheses in chapter 6. These in turn fashioned the research instrument developed in chapter 7.

Having outlined the manner in which the research is constructed both with regard to the research concepts and the framework within which such concepts are developed, it is worth noting that there are, however, a number of limitations to the research. These limitations constrain the application of the research and suggest the need, in some instances, for further research. The following section discusses these limitations, the manner in which they are addressed and the potential of further research before the final section identifies the main findings of the research and their implications for accounting policy-makers.

12.3 LIMITATIONS AND OPPORTUNITIES OF THE RESEARCH

Having embarked on research in the general area of accounting and uncertainty, the manifestation of this research is relatively narrow. The strength of experimental research is the level of control which can be exercised. This is also its weakness as, very often, the exercise of such control requires a narrow focus. This leads to several doubts regarding the manner in which the research developed. The discussion of these limitations encompasses the broader concerns of the research. These limitations are in certain instances mitigated by the objectives and design of the research. They also offer opportunities for further development of research in the area of uncertainty.

The first limitation concerns the financial statements supplied to participants. One of the aims of recent accounting standards has been to encourage a focus on a broad range of information available within financial statements. Users take a broad, non-myopic view of financial statements. Surveys by, for example, Lee and Tweedie (1977 and 1981) and Arnold and Moizer (1984) have found that users do not rely simply on the profit and loss account and balance sheet. Yet the research instrument proposed provides only a profit and loss account and balance sheet and the selected disclosures. Little background information and no annual report is provided.

Much of the previous accounting work which has used experiments has taken this approach (e.g. Elias, 1972; Hendricks, 1976; Birnberg and Slevin, 1976; Libby, 1979a and 1979b and Chen and Summers, 1981). It is like establishing a bridgehead on a narrow front before moving beyond to wider fields. Litterer (1965) suggests that decision-makers perceive information by selecting from

the broad information set. This selection is influenced, for example, by the experience of the decision-maker. The broader the information set that is provided, therefore, the greater the variation that may occur not because of the information itself, but because of its variety and the experience of the decision-makers. A focus on a narrow information set limits the potential for variation in such selection mechanisms. This does not necessarily mean that research ends having established a bridgehead: having found that the bridgehead is tenable, further research may legitimately expand beyond its limited boundaries.

The second limitation concerns the subjects involved in the research, their representativeness and, hence, the external validity of the research. This limitation was discussed in some detail in Section 5.4.3. In this research, the experimental subjects were not homogeneous but constituted subjects with differing experiences and characteristics as do the users of financial statements described in chapter 2. Chapter 11 explored the variances between the performance of participants and finds that this variance is only significant in the case of the effects of gender and current educational status on their *expressions of confidence* only. Little difference was perceived in the *assessments* of the different participating groups. Thus the nature of the subjects and their random allocation to the experimental groups serves to limit the external invalidity of the research while not weakening its internal validity.

The third limitation is related to the second. As outlined in chapter 5, the disclosure of additional information exposes participants to information of a nature and in a form possibly not seen by them before. Birnberg (1976) and Chang and Birnberg (1977), for example, comment that additional disclosures may lead to 'information overload' and 'functional fixation'. Users may require a period of learning and adaptation to new forms of accounting treatment and disclosure. On the other hand, Thaler (1987) argues that users do not in fact have the opportunity to learn. They are instead sporadically exposed to new information which they are expected to understand without necessarily having the time to absorb and learn its significance. Furthermore, the research does not concern itself with changes in accounting treatment which has been the subject of numerous other pieces of research in accounting. It involves the disclosure of new information. The feedback from the pilot group (who would not be more sophisticated than the participants of the actual experiments) in chapter 7 indicates that the information disclosed is not difficult to understand or apply.

A fourth and final issue concerns the nature of the disclosures. One wonders whether the research has become concerned with accounting for remote and inestimable contingencies rather than with uncertainty in general. In particular, for the reasons of control outlined in clapters 5 and 6, the diclosures concerning assets and liabilities related to limited (or 'capped') losses only. In addition, constrained by current accounting conventions (e.g. in SSAP 18), this led to the assymetric consideration of recognised assets but unrecognised liabilities.

Uncertainty affects financial statements in many ways. The exclusion of business risks and the focus on the uncertain nature of financial statements and remote contingencies represents a significant narrowing of the research. However, having decided to focus on proposals that are in the domain of current standard-setting, the means of making the hypotheses concrete became narrower. Furthermore, perhaps the focus should be on the end rather than the means: that the research instrument is simply a way (and not the only way) of testing the hypotheses outlined. The research then becomes indicative and not definitive. Having described the world as a complex and changing place which accounting struggles to reflect, perhaps research also can only capture a corner of the confusion.

12.4 THE CLARITY OF FULLNESS: MAIN POLICY IMPLICATIONS OF THE RESEARCH

Only fullness leads to clarity[1]

Chapters 8 to 11 identified in considerable detail the main findings of the research. These findings were summarised in each of these chapters (8 to 11) in the context of the research questions and previous research in the area. In general, the effects of the disclosure of uncertainty varied depending on the nature of the disclosures and on the characteristics of the reporting entities. As this research was policy-driven in the objectives set out in chapter 2 and, hence, in the focus adopted in chapter 5, the findings have a number of implications both in the support and lack of

[1] From Schiller's 'Sayings of Confucius'.

support for the research hypotheses. This section will explore some of the implications for accounting policy-makers (rather than in a theoretical sense) of the research findings. As noted in chapters 2 and 4, policy-makers (e.g. the ASB, the AICPA and the CICA) have been particularly active in considering these issues. Therefore, these findings are of interest not only in Ireland and the UK but also in those other jurisdictions such as the US and Canada.

12.4.1 Effects of disclosures

The broad finding of the research is to confirm the view propogated in chapter 2: uncertainty matters. Uncertainty is relevant to the development of financial reporting. Generally, the research found that, to varying and differing degrees, the disclosure (or lack of disclosure) of uncertainty had an impact on decision-making and confidence. Policy-makers should continue to address the nature of uncertainty when framing financial statements which will be relevant and which will portray the complex and uncertain reality of modern business.

Uncertainty, however, is not homogeneous. It afflicts financial statements generally, but also particular items in financial statements, their occurrence and their outcome. Furthermore, therefore, it would appear that different types of uncertainty have a different flavour, a different potency and that the framing of the disclosures of such uncertainty also matters.

Essentially, two types of disclosure had particular effects on the assessments of the experimental subjects of the financial performance and position of the reporting entities. First, the disclosure of the uncertain nature of financial statements led to poorer perceptions of the reporting entities. This leads one to support the view of, for example, the AICPA (1994) that the judgmental, uncertain nature of financial statements should be disclosed in financial statements. Such a finding indicates that such a disclosure may serve to educate users regarding the nature of financial statements rather than to inform them of the reporting entity which they perceive through the prism of financial statements. The disclosure would, therefore, serve perhaps a short-term role which would dissipate as users became more aware of the uncertain nature of financial statements.

Secondly, the clarification of the potential occurrence of a 'remote' event had a more marked effect overall on the assessments and confidence of the experimental subjects. The range of the remote event that was used (5% - 8%) was less than that suggested, for example, by the CICA (1993) (who define remote as less than 15%). The implications of this finding are manifold:

a) the disclosure of (in Sterling's terms (1985)) numerals rather than words to denote phenomena would appear to add power to the descriptions of probability. Chesley (e.g. 1986) argues that the mapping of words to phenomena can be a subjective process with quite divergent notions or definitions of the meaning of words such as remote, probable or possible. As this disclosure also appeared to strengthen the consensus between the experimental subjects, it appeared to create a stronger shared or 'intersubjective' reality. For these reasons, the disclosure of ranges of probability would appear to add to the ability of the financial statements to communicate meaning. This supports moves, however disparate or tentative, by the ASB, for example, in FRS 6 (1994b) and FRED 14 (1997b) and the AICPA (1994) towards such disclosures of contingencies.

b) the definition of remote of the experimental subjects would appear to be less than 15% (in fact less than 5%-8%) in the case of both assets and liabilities. This may appear to undermine the attempts by the CICA (1994) to define 'remote' as such a level of probability. However, it may paradoxically support some definition of phrases such as remote in financial statements and / or accounting standards so that standard-setters, preparers and users can share a mutual understanding of what such concepts mean. In other words, if standard-setters define remote as less than 15%, this level of probability may come to be accepted as meaning 'remote'.

c) The lack of effect in the context of the general disclosure of the remote event with an inestimable outcome (A1 and L1) and also of the clarification of inestimable outcome (A3 and L3) indicates that users are more interested in occurrence than outcome. This finding is however tempered by the capping or limiting of the outcome (for the reasons outlined in chapters 5 and 7) at £900,000. This limitation was addressed in Section 12.3.

12.4.2 Effects of the characteristics of the reporting entities.

The effects of the disclosures of uncertainty were found to differ between the reporting entities. In some instances, for example, the extent of debt appeared to create a particular focus on uncertainties regarding liabilities, the extent of growth a concern regarding guarantees etc. These varied, sometimes inconsistent results created a wider consideration of the effects of the disclosures of uncertainty.

Disclosures are generally, though not exclusively (those required by company law being one exception) determined by the materiality of the item(s) in question. The ASB (1995b, p. 42) defines materiality as information which could influence users' decisions. It includes among the aspects to be considered in assessing materiality

> the events and transactions giving rise to it and the particular financial statement headings that are affected. Circumstances that are considered include other elements of the financial statements taken as a whole and other information available to users that would affect their evaluation of the financial statements: this involves, for example, a consideration of the implications for the evaluation of trends.

Thus materiality, and as a result the recognition and / or disclosure of financial statement items, is driven by judgments of their relative size, their context, their potential to influence judgments. These findings suggest that considerations of disclosure should consider the characteristics and the perceptions of the reporting entity which the characteristics of the reporting entity create: that materiality should also explicitly embrace the context and nature of the particular reporting entity. For example, highly geared firms may need to disclose more information regarding the uncertainty of debt than less highly geared firms. It may be useful for firms with static or declining turnover whose stock is of a kind that may become obsolete over a relatively short period to disclose information concerning the uncertainty of such obsolescence. This strengthens the ASB's suggestion (ASB, 1995b, p. 42) that considerations of materiality should include, for example 'the implications of the item for the evaluation of trends'.

Not alone does this broaden the consideration of materiality, it also raises the issue of what triggers the disclosure of uncertainty. The ASB in its draft *Statement of Principles* (ASB, 1995b), as well as the CICA (1993) and the ASB's FRS 6 (ASB, 1994b) suggest that the trigger for such disclosures should be a lack of sufficient evidence to allow the recognition and / or measurement of particular items in the financial statements. This finding, further, suggests that this trigger should also incorporate the nature of the uncertainty and its potency in the context of the particular reporting entity. Essentially, therefore, the findings concerning the different effects between reporting entities calls for a wider consideration of disclosure which would include the nature of the reporting entity itself.

12.4.3 Uncertainty of assets vis-a-vis liabilities

One of the research questions concerned whether disclosures of uncertain assets would have different effects than the disclosure of uncertain liabilities given the asymmetric approach of accounting conventions to the recognition of assets and liabilities. Differences in this regard were not significant. The research did not support the notion that assets and liabilities *per se*, and uncertainties therein, are perceived differently by the users of financial statements.

The research did, however, reveal the importance of perceptions of the reliability of financial statement items generally and certain items in particular to the disclosure of uncertainty. Assets were universally perceived as being less reliable than liabilities. As discussed in chapter 10, this conflicts with the view of the ASB that more evidence is required for the recognition of an asset than a liability. However it does support the subtle shift away from the focus on evidence supporting the recognition of assets and liabilities alone which characterised an early version of the ASB's *Statement of Principles* (1992b, para. 24) to a consideration of gains and losses and their associated assets and liabilities in later documents (for example in a later draft of *the Statement of Principles* (ASB,1995b) and in FRED 14: *Contingencies and Provisions* (ASB, 1997b).

This finding indicates that the idea of reliability is broader than recognition alone. Reliability encompasses representational faithfulness: that the item faithfully represents what it purports to represent, not alone its existence (and hence recognition) but also its value (and hence its

measurement). Valuation also, it would appear, is part of the tapestry of reliability. Chapter 10 argued that this supports the ASB's current preoccupation with the valuation of assets in financial statements (through, for example their Discussion Paper *The Role of Valuation in Financial Reporting* (ASB, 1996)).

Furthermore, it would suggest that reliability includes completeness as noted by the ASB (1995b, p. 41). Many of the proposals outlined in chapter 2 and those comprising the research instrument (being subjective), on the face of it, appear less reliable or objective than the current recognition and disclosure in financial statements. However, if reliability is deemed to include such characteristics as 'faithful representation', 'substance' and 'completeness' (ASB, 1995b, pp. 44-46) such disclosures are more reliable than single point measures which do not represent the substance of doubt completely.

Imposing more stringent tests regarding the existence of assets in the face of uncertainty leads to more reliable evidence regarding *recognised* assets than *recognised* liabilities. It also results however in unrecognised assets and an incomplete portrayal of the assets (recognised and unrecognised) of the firm. Hence, imposing stricter hurdles on the recognition of assets does not necessarily lead to more reliable, complete assets. Disclosure of uncertainty, this research suggests, mitigates such lack of completeness.

This, in a sense, encapsulates the findings of this thesis. Uncertainty matters: it is at the heart of the recognition of assets and liabilities. The framing and context of the disclosure of uncertainty matters. Moreover, its disclosure adds to a clearer and fuller representation of the assets and liabilities of the reporting entity.

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