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DERIVATIVES USE AMONG
NON-FINANCIAL FIRMS LISTED ON THE
AUSTRALIAN STOCK EXCHANGE

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DERIVATIVES USE AMONG NON-FINANCIAL FIRMS LISTED ON
THE AUSTRALIAN STOCK EXCHANGE

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A research report submitted to the Faculty of
Management, University of the Witwatersrand, in
partial fulfillment of the requirements for the degree
of Master of Business Administration.

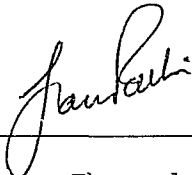
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ABSTRACT

The consideration of the appropriate use of derivatives by non-financial services firms has become increasingly important as numerous "derivative related disasters" have befallen corporations in the last decade. The purpose of this study was to examine aspects of derivatives use, with a focus on the appropriateness of derivatives use, by listed non-financial firms in Australia. The results were compared to benchmarks established by related studies undertaken in the United States. Overall the results seem to indicate that listed non-financial services firms in Australia tend to be more conservative in their management of derivatives and the associated risks than US firms and the appropriate internal controls appear to be enforced. Derivatives are primarily used for the management of financial price risk than for speculative activity.

DECLARATION

I declare that this research report is my own, unaided work. It is submitted in partial fulfillment of the requirements of the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

A handwritten signature in black ink, appearing to read 'Devon Pather', is written over a horizontal line.

Devon Thavendran Pather

January, 2000

DEDICATION

To Esther (JJM) for her love and friendship for so long and through so much.

To my parents and sister for their support and guidance.

Thanks to my supervisor, Frank Durand, for his time
and advice.

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Chapter 1: INTRODUCTION

1.1 Research Problem

The research involved examining the nature of the use of derivatives among non-financial firms listed on the Australian Stock Exchange. The main focus of the research was the appropriateness of the use of derivatives by these firms.

The issues considered in determining the appropriateness of the use of derivatives included:

- the rationale for managing financial price risk
- the extent and nature of the use of derivatives and non-derivative approaches to the management of financial price risk
- the awareness of the issues and risks associated with the use of derivatives
- the management of the risks associated with the use of derivatives

1.2 Background to the Research

A number of other studies have investigated the determinants of corporate hedging (the management of financial price volatility). Notable researchers include Nance, Smith and Smithson (1993), Froot, Scharfstein and Stein (1993), and Tufano (1998).

A large body of literature exists on the extent and nature of the corporate use of derivatives (Bodnar, Hayt & Marston (1998) and Klein & Lederman (1996). Bodnar *et al.* (1998) and Bodnar & Gebhardt (1998) focused on the use of derivatives by non-financial firms in the United States and Germany respectively.

This research attempted to validate these results in Australia by replicating aspects of the surveys undertaken by Bodnar *et al.* and Bodnar & Gebhardt in 1998. The results were placed within the context of a risk management framework to determine the appropriateness of the use of derivatives by non-financial services firms listed on the Australian Stock Exchange.

1.3 Problem and its relevance to management

Businesses have always faced priced risk and sought ways to protect themselves against unwanted risk. As the business world has become increasingly sophisticated, complex and international, the demand for risk management has increased. Modern financial theory and technology have enabled financial engineers to supply increasingly sophisticated instruments to meet this demand. The result has been the evolution of derivatives - a continual expansion of the number and types of markets in which derivatives are used as well as the number and type of derivatives available.

1.3.1 Increasing price volatility

Historical volatility of asset prices across all asset sectors has increased over the past two decades.

This has created an imperative for firms to actively manage their financial risk exposures. It is important for management to understand which factors influence the decision to use or not to use

derivatives as the risk management tool of choice.

1.3.2 Recent "Derivative Disasters"

There have numerous examples of firms, both financial and non-financial, that have experienced financial difficulty or even bankruptcy as a result of their use of derivatives (see Table 1).

The incidence of such disasters creates an imperative for management to understand the risks associated with the use of derivatives, and the tools available to manage derivatives risk.

<u>PERIOD</u>	<u>ORGANISATION</u>	<u>EVENT</u>
1986-1988	Hammersmith & Fulham local authority	\$900m loss on sterling interest rate swap in 1991
Mar-91	Allied Lyons	\$265m loss on forex options
Feb-93	Showa Shell Sekiyu	\$1.4b write-off on forex forward contracts
Dec-93	Metallgesellschaft	\$1.3b loss on oil futures trading
Jan-94	Codelco	\$207m loss on copper futures
Apr-94	Kashima Oil	\$1.5b loss on dollar derivatives
Apr-94	Proctor and Gamble	\$1.2m loss on leveraged interest rate swaps
May-94	Air Products and Chemicals	\$60m loss on interest rate derivatives
May-94	Sandoz	\$78.5m loss on derivatives
Jun-94	Gibson Greetings	\$19.7m loss on interest rate derivatives
Dec-94	Orange County	\$1.7b loss on leveraged interest rate products
Feb-95	Barings	\$1.4b loss accrued on index contracts on Singapore and Osaka exchanges
Jul-96	Sumitomo	\$2.8b loss on copper derivatives

Table 1: Recent Incidents of Major Derivative Losses
Source: Banks (1997, p21)

Chapter 2: LITERATURE REVIEW

2.1 Defining Risk

Galitz (1995, p5) defines risk as "...any variation in outcome."

According to Smith & Wilford (1992), financial price risk (or market risk) refers to the risk that losses will be incurred as a result of adverse movements in rates or prices.

Four sources of financial price risk were identified:

1. Exchange rate risk
2. Interest rate risk
3. Commodity price risk
4. Equity price risk

Each source is explored in depth in Appendix 1(a).

Rawls & Smithson (1993, p357) introduce the notion of financial price risk as encompassing three very different kinds of risk under the umbrella of

"strategic exposure". *Accounting exposures* are those transaction exposures arising from direct expenses or sales to which the firm is contractually committed. A subset of accounting exposure is the *translation exposure* faced by multinational organisations. This occurs when a firm converts the financial statements of overseas subsidiaries from local currencies to the home currency to produce a consolidated financial statement. *Contingent exposures* refer to changes in exchange rates, interest rates or commodity prices that affect the value of the firm through future transactions.

2.2 Defining Risk Management

Mian (1996, p419) defines risk management as "... the activities undertaken by the firm in order to mitigate the impact of these uncertainties on the value of the firm."

Ross et al. (1996, p627) define hedging as "... reducing a firm's exposure to price or rate fluctuations."

According to J.P Morgan and Company Incorporated (1997), while hedging specifically relates to the management of financial price risk that is the focus of this paper, risk management is an enterprise wide concept. It requires an understanding of:

- financial price risk (or market risk)
- credit risk - the degree of uncertainty of the ability of counter-parties to fulfill their legal obligations
- operational risk - uncertainty related to losses resulting from inadequate systems or controls, human error, or management failure
- legal risk - uncertainty regarding the possibility that a contract will not be enforceable

This paper proposes to use the terms "risk management" and "hedging" interchangeably and specifically relating to activities undertaken by the firm to reduce its exposure to financial price risk.

2.2.1 Hedging versus Speculation

According to Marshall & Ellis (1994), speculation involves the taking of a position in a financial instrument in anticipation of a favourable fluctuation in the price of that asset that results in a speculative profit. The principle objective of hedging, however, is to take a position that results in an outcome that offsets the impact of unfavourable moves in financial prices on the value of the firm.

2.3 Theories on the Incentives to Manage Financial Price Risk

Appendix 1(b) provides an overview of 5 theories on the incentives to manage financial price risk. These include:

1. Reduction in the cost of finance
2. Reduction in the probability of financial distress
3. Reduction in agency costs
4. Reduction in expected tax liabilities
5. Economies of scale of risk management

Each view involves relaxing one or more of the assumptions inherent in Modigliani & Millers' (1958) theorems in a world with no market imperfections. These assumptions include the absence of taxes, financial distress costs, contracting costs, information costs, and capital market imperfections.

The relaxation of each assumption creates an incentive for risk to be managed at the firm level.

2.4 Derivatives as a Risk Management Tool

Gunston (1995, p42) defines derivatives as "... financial products whose value (and existence) are linked to (derived from) the value of, or changes in, the value of an underlying 'item or index'."

This definition encompasses products such as futures, forwards, swaps and options and combinations thereof in more complex engineered products.

In accounting for the popularity of derivatives as

risk management instruments, Cannon (1995, p8) states, "Derivatives are leveraged products. It is because derivative instruments distinguish the risk profile of financial instruments from their cash flows that they have become such an effective and efficient tool in overall financial risk management. This feature has enabled corporates and others to rebalance or reduce their economic and other financial exposures quickly and effectively for a relatively small initial cash outlay."

Dilewyns (1996) summarises the use of derivatives under three main headings - hedging, speculation and arbitrage. In the framework of a non-financial company, unless explicitly permitted by management, using derivatives is only acceptable for hedging purposes, to eliminate a particular exposure by adopting an opposing position in one or more instruments. Derivatives offer the opportunity to achieve the 'perfect hedge' when a hedging instrument is found that exactly mirrors the underlying risk and in doing so eliminates all uncertainty.

2.5 Derivatives Theory

According to Cannon (1995) derivatives have been used by firms for many years and many of the classical instruments and uses pre-date the coining of the term 'derivatives' which only emerged as a collective description in the late 1980's. Commodity and currency futures, forwards and options have had long established roles in assisting firms to reduce or extinguish unacceptable risks and uncertainties. In recent years new forms of derivatives such as swaps have provided firms with opportunities to contain or reduce their funding costs, often with negligible incremental risk.

In Appendix 1(c) definitions and pay-off profiles for forward contracts, futures contracts, swap contracts and option contracts are provided. The distinction between exchange traded and over-the-counter derivative contracts is also made.

Appendix 1(d) illustrates the combination of derivatives to manage financial price risk.

The results of previous surveys of the use of derivatives by non-financial firms are presented in Appendix 1(e).

2.6 Types of Hedging

Klein & Lederman (1996) propose three types of hedging with derivatives.

2.6.1 The Straight Hedge

The straight hedge is an attempt to make the cash flows between the asset and the hedge instrument symmetric so that the losses and gains cancel each other out.

2.6.2 The Options Hedge

Klein & Lederman (1996) suggest that the goal of an options hedge is to purchase the possibility of exposure without having to assume it unless it is needed. The result is an asymmetric cash flow. This means that the value of the underlying asset remains unchanged by the option (less the cost of the option) unless the option is elected.

2.6.3 The Speculative Hedge

Klein & Lederman (1996, p32) define the speculative hedge as "an attempt to protect the value of an asset by using a proxy when the hedge instrument is not a derivative of the asset, or when the historical relationship between the hedge instrument and the underlying has been volatile beyond what one considers stable enough for a hedge."

Letwin (1996) proposes two conflicting views on the need for the hedging of financial price risk by firms.

Firstly, commodity companies should not hedge because the investor inherently assumes the responsibility for the price risk when investing in the commodity sector. The principal assumption underlying this premise is that an investor derives a greater portion of his/her investment return from the movement in commodity prices rather than from the selection of companies.

Secondly, there is a need for commodity companies to integrate price risk management into the course of business activities, as part of their fiduciary responsibility to shareholders. This duty creates the imperative for cash flow protection through hedging.

A review of literature relating to the risk associated with each type of hedging may be found in Section 2.7.

2.7 General Risks Associated with the Use of Derivatives

KPMG Peat Marwick (1994) document four key risks associated with the use of derivatives:

1. Market risk
2. Credit risk
3. Legal risk
4. Operational risk
5. Liquidity risk

Each risk is defined in Appendix 1(f).

2.8 Specific Risks Associated with Different Types of Hedging

Klein & Lederman (1996) propose three types of hedging (see Section 2.6) with derivatives and the risks with each.

The Straight Hedge

Correlation risk - is the risk that the value of the hedge instrument will change unequally to the value of the asset as the assets value changes in the market place. Typically correlation risk is greatest where the hedge instrument is not a direct derivative of the underlying. That is the hedge instrument may be derived from an asset with a different maturity, liquidity or risk profile.

Ratio risk - is the risk of using the incorrect amount and combination of hedge instruments. Ratio risk always increases when price changes result in changes in the hedge ratio.

Execution risk - is the risk that a hedge may be improperly initiated or liquidated. Execution risk

tends to be higher when strategies like dynamic hedging require hedge positions to be changed regularly.

Liquidity risk - is the risk that the hedge instrument cannot be purchased or liquidated at the correct price.

Model risk - is the risk that the derivatives pricing model may be incorrect. Particular attention must be paid to the assumptions that are being used to determine the structure of the hedge are sound.

The Options Hedge

Option hedge risk is a complex combination of the aforementioned risks.

Further, options also add additional risks such as interest rate risk and volatility risk. As key inputs to most option pricing models, poor interest rate and volatility assumptions may cause mispricing.

Liquidity risk is also considered to be significant, particularly where a position is hedged through exotic or OTC options.

The Speculative Hedge

Klein & Lederman (1996) suggest that judgement risk is the core of speculative hedging. Since any mix of assets of assets and hedges could be used, it is impossible to plot the cash flows associated with such hedges. The role of judgement becomes significant in determining the hedging instruments and the size of the positions to be taken.

2.9 Management of Derivatives Risk

Cannon (1995) proposes the following as common themes of recent derivative disasters:

1. Failing to set appropriate guidelines for derivatives activity; or
2. Failing to adhere to authorised levels of activity; or

3. Failing to identify and focus on the full risk profile of various derivative strategies; combined with

4. Failing to impose suitably robust standards of internal control.

Ultimately poor internal controls allow an initial error or abuse to be perpetuated over long periods of time so as to have a potentially destructive impact on a corporation.

Lewent & Kearney (1993) suggest that the effective use of derivatives to manage exposures requires a detailed understanding of the nature of the exposures, as well as a clearly defined rationale for using derivatives to manage that risk.

Any plan to use derivatives to manage financial price risk requires the consideration of the following:

- a review of the likelihood of adverse fluctuations

in the price of the asset/liability that has the potential to create, or is creating, an exposure;

- strategic plan impact which quantifies the potential impacts of adverse price/rate movements over the period of the plan;
- a critical examination of the reasons for hedging;
- selection of which instruments to use and how to execute the hedge; and
- determination of a hedging program which is cost-effective and matches the risk tolerance profile of the firm.

Lewent and Kearney's approach focuses on management of derivatives risk through the creation of a rationale for the use, and implementation of a rigid system of criteria which determine acceptable levels of derivatives use. Their approach also encompasses the management of operational risk associated with the use of derivatives. This would include:

- Board of Directors involvement in the derivatives mandate
- policy formulation

- risk limits
- risk measurement

Blaauw (1997) discusses corporate applications of a 'Value-at-Risk' (VAR) model which is widely used in the financial sector to measure market risk. In order to measure VAR, the information required includes the current market value of a position or portfolio, the expected changes in value, and the confidence limit. He suggests that the growth in VAR as a derivatives risk management tool can be attributed to two factors:

- the widespread acceptance of VAR by the international financial community as a method for ascertaining market risk capital requirements
- the technology available to support the use of VAR

Blaauw (p39) presents a strong case for the use of VAR as a tool to manage the financial price risk associated with derivatives.

According to Evans (1996), the International Swaps

and Derivatives Association (ISDA) has devised master documentation to be used in OTC derivative deals. This has the potential to reduce the level of concern amongst derivative users, regarding legal risk, through the development of standard documentation that eliminates some of the legal uncertainty on the enforceability of derivatives contracts in jurisdictions around the world.

Klein & Lederman (1996), propose that the first step in avoiding derivative disasters is to ensure three kinds of failure they believe to be the cause of large losses are dealt with:

1. Knowledge failure - people involved in the derivatives decision making process need to know their business and understand derivatives.
2. Accountability failure - two primary controls required are a policy statement and an evaluation procedure.
3. Judgement failure - the largest risk lies in the

individuals making decisions and executing trades rather than the markets themselves. Enforcement of a derivatives mandate and monitoring of individuals becomes essential.

2.10 Alternatives to Hedging with Derivatives

Nance et al. (1993) proposes four approaches to financial management that reduce the need to hedge with derivatives altogether. These are:

1. Balance sheet restructuring
2. Issuance of preference stock
3. The issuance of convertible debt
4. Dividend restrictions

Neuberger (1996) propagates the notion of operations diversification to act as a natural internal hedge.

Baldoni & Yeager (1995) discuss the use of risk sharing arrangements as alternative form of hedging to the use of derivatives.

The definitions and merits of the alternatives to hedging with derivative instruments are presented in

Appendix 1(g).

2.11 The Impact of Developments in the Accounting Treatment of Derivatives

In 1996, the Australian Accounting Standards Board (AASB) issued the new accounting standard, AASB1033/AAS 33: Presentation and Disclosure of Financial Instruments. The Standard, applicable to reports after 31 December 1997, defined financial instruments to include derivatives. The effect was that any organisation, regardless of size, would have to present and disclose information on the use of derivatives, regardless of the purpose of the use. According to Ernst & Young (1997), prior to this requirement many companies assumed that because they did not use derivatives, they did not hold financial instruments.

The standard for derivatives also includes the objectives for holding or issuing derivatives

The requirements of the standard for hedges of anticipated future transactions includes:

- the description of the anticipated transaction
- the description of the hedging instrument; and
- deferred gains or losses and the expected timing of revenue or expense recognition.

Gastineau (1995) suggests that the only useful elements of current accounting disclosure requirements are the market value requirements, and derivative profit and loss reporting requirements. He goes further to suggest that accounting data does not really lend itself to any kinds of risk analysis. Suppose for example that the notional value of a derivative position revealed is small and the marks-to-market for successive accounting periods reveal no significant market value fluctuations in a variety of interest rate, currency, commodity, and stock prices. In such a situation, there is little apparent need on the part of investors or analysts to delve deeper.

Gastineau's inference is that the accounting disclosure requirements offer little incentive for firms to reveal their derivative positions. Firstly,

this may be due to an inability of the market to adequately assess the change in the risk profile of the firm following the adoption of a derivatives program. Secondly, derivatives disclosure standard may result in disclosure of confidential competitive information. Finally, misrepresentation of reports, by the media for example, can create panicked responses from investors.

Schlumberger (1995) supports the view that the disclosure of the use of derivatives may place the reporting firm at a competitive disadvantage.

Chapter 3: PROPOSITIONS

Proposition 1

The reduction of the probability of financial distress is the most important influence in the decision to manage financial price risk.

Proposition 2

The predominant motivation for the use derivatives is the management of financial price risk.

Proposition 3

Counter-party credit risk is the most important issue for the users of derivatives.

Proposition 4

Users of derivatives employ appropriate internal controls to manage derivatives risk.

Proposition 5

Accounting disclosure requirements do not influence the decision to use derivatives to measure financial price risk.

Chapter 4: RESEARCH METHODOLOGY

4.1 Research Method

A *non-experimental quantitative research* method was selected to test the propositions. Leedy (1997, p189) described this type of research as "... making careful descriptions of observed phenomena and/or exploring the possible relationships between phenomena."

The technique selected for the collection of data was the questionnaire.

4.2 The Population Researched

The population that was researched consisted of non-financial services companies listed on the Australian Stock Exchange.

The population consisted of 1035 firms.

4.3 The Sampling Approach

The primary aim of this research was to investigate the appropriateness of the use of derivatives by listed non-financial services firms. A secondary aim was to obtain insight into the issues predominant in the decision not to use derivatives.

While a judgmental approach to sampling was used, an effort was made to not discriminate between users and non-users of derivatives.

4.3.1 Sampling Method

Firms were selected from the population of non-financial services companies listed on the Australian Stock Exchange. Those companies classified in the following sectors were excluded:

Financial - Developers and Contractors

Financial - Banks

Financial - Insurance

Financial - Investments and Financial Services

Financial - Property Trusts

The number of firms selected from each included

sector was determined by proportional representation for a total sample size of 300 (illustrated in Table 4.1, p38).

The largest companies, in terms of market capitalisation, were chosen from each sector.

Sector	Number	Percentage	Sample
	Firms	Total	
Gold	268	26%	77
Other Metals	118	11%	34
Diverse Resources	4	0%	1
Energy	74	7%	21
Infrastructure Utilities	18	2%	5
Building Materials	20	2%	6
Alcohol and Tobacco	24	2%	7
Food and Household Goods	39	4%	11
Chemicals	9	1%	3
Engineering	41	4%	12
Paper/Packaging	10	1%	3
Retail	40	4%	12
Transport	15	1%	4
Media	36	4%	11
Telecommunications	30	3%	9
Miscellaneous Industrials	180	17%	52
Diverse Industrial	27	3%	8
Healthcare/Biotech	45	4%	13
Tourism/Leisure	37	4%	11
TOTAL	1035	100%	300

Table 4.1 Sample Composition

4.3.2 Sample Size

Leedy (1997, p211) suggested that a population of 1000 would require the selection of a sample of 285 firms. A sample of 300 was used.

In a similar survey in the United States, Bodnar, Marston & Hayt (1998) reported a 20.7% response rate from a randomly selected sample of 1928 firms. In Germany, Bodnar & Gebhardt (1998) reported a 34.2% response rate from a random sample of 368 companies. In South Africa, Merrifield (1998) reported a response rate of 22% from a judgmental sample of 300.

Considering these surveys and typical response rates in Australia ranging between 20% and 25%, a response rate of 20% was assumed. 60 usable responses were considered to be sufficient for the purposes of this study.

4.3.3 Limitations Imposed by Sampling Approach

Random sampling was not used, therefore on the basis of the results obtained, it would not be possible to infer anything about the appropriateness of the use of derivatives in the general population of listed non-financial services companies in Australia.

Due to differences in sampling techniques it would not be possible to directly compare the results of this analysis with those obtained in surveys by Bodnar, Marston & Hayt (1998), Bodnar & Gebhardt (1998) and Merrifield (1998). The findings of previous researchers, nonetheless, provide a valid backdrop against which to view the results of this study.

4.4 Method of Data Collection

4.4.1 Questionnaire Design

The data collection was through the questionnaire. The format was based on the questionnaire designed by Bodnar, Marston & Hayt (1998) for their survey of

financial risk management by U.S. non-financial firms. It was modified to meet the objectives of this study.

Question 8a, 8b, 9c, 10, 11, 12, 13, 14, 15, 16 and 18 were directly extracted from, or were based on, the Bodnar et al. questionnaire.

Two experienced derivative practitioners were asked to review the questionnaire for instances of ambiguity and relevance.

4.4.2 Questionnaire Structure

Each of the five parts of the questionnaire examined an aspect of risk management and derivatives usage. The sections were as follows:

Part A: Background Information

Questions in this part focused on obtaining data on the industry type and the size of financial price exposures faced by respondents.

Respondents were asked to rank their degree of

concern with different types of exposure, and rank the importance of factors in their decision to manage financial price risk.

The data obtained from this part was used to evaluate Proposition 1.

Part B: Non-Derivative Risk Management Approaches

This part of the questionnaire examined the extent of the awareness and usage of non-derivative financial price risk management approaches by respondents.

The data obtained from these questions was used to partially evaluate Proposition 2. Additional data from Part C and Part D was used to complete the evaluation.

Part C: Use of Derivatives

This part of the questionnaire examined the extent of the use of derivatives by respondents, and the importance of factors in the decision not to use derivatives to manage financial price risk.

Data obtained in this section also provided insight to the types of derivatives used by firms and changes in the intensity of the usage of derivatives.

The data obtained from these questions was used to partially evaluate Proposition 2.

Part D: Management of Derivatives Risk

Questions in this part were focused on obtaining data on the derivatives practices of respondents.

Specific aspects examined were as follows: type of hedging activities using derivatives, ranking of issues and risks associated with the use of derivatives, internal control and management of the risks associated with the use of derivatives.

The data obtained from this section was used to complete the evaluation of Proposition 2, and evaluate Proposition 3 and 4.

Part E: Impact of Accounting Standards

Issues relating to the disclosure of information on the use of derivatives were examined in this part.

Data obtained from this part was used to evaluate Proposition 5.

4.5 Method of Data Analysis

The data extracted from the questionnaire was analysed using a combination of qualitative and quantitative methods.

Relative frequency analysis was the predominant method used. The presentation of data was accomplished through the use of bar charts, relative frequency distributions and pie charts.

This was the same method of analysis used by Bodnar, Marston & Hayt (1998), Bodnar & Gebhardt (1998) and Merrifield (1998) in similar research.

The Chi-square test for significance was used to increase the richness of the analysis where there

was considered to be value in determining whether different industry groups exhibited differences in their response to specific questions.

Chapter 5: ANALYSIS OF RESULTS

Responses were obtained from 80 of the 300 non-financial services firms included in the sample. The response rate of 26.7% was not considered atypical of such surveys.

5.1 Background Information

This part of the questionnaire focused on obtaining information on the general nature of the respondents.

5.1.1 Industry Analysis

Respondents were asked to indicate the industry sector that best reflected the nature of their business. The analysis of responses to this part of the questionnaire was conducted by industry sector. The aim of this was to determine whether there was any meaningful difference in the responses to the questions across the primary, manufacturing and services sector.

Figure 5.1 presents the proportional representation of respondents from the three sectors. The number of respondents from each sector was fairly even.

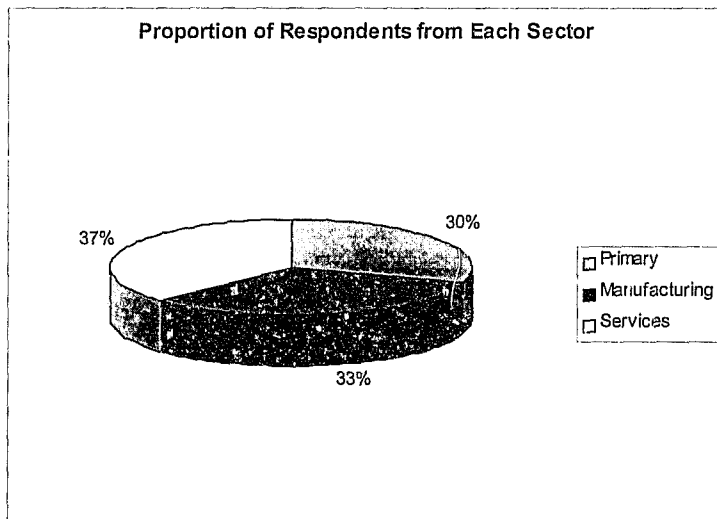


Figure 5.1 Proportion of Respondents from Each Industry Sector

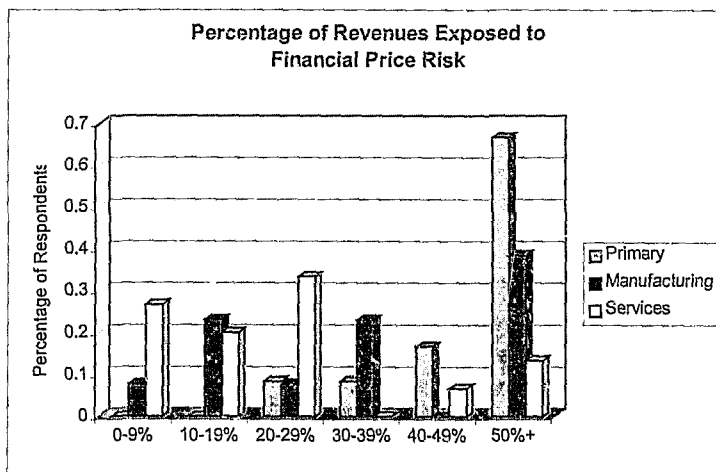
5.1.2 Extent of Exposure to Financial Price Risk

Question 3a and 3b attempted to extract information on the extent of the respondents' exposure to financial price risk. Firms were asked to indicate what percentage of their consolidated costs and revenues were exposed to financial price risk. The relative size of exposures was considered to be a more effective means of comparing the extent of

exposures across industry sectors.

5.1.3 Extent of Revenue Exposure

The results in Figure 5.2 indicate that 67% of respondents from the primary industry group reported that more than 50% of revenue was exposed to financial price risk. In the services industry, 80% of the respondents indicated less than 30% of revenue was exposed, while in manufacturing industry, 40% of respondents reported exposures



greater than 50%.

Figure 5.2 Extent of Revenue Exposure by Industry

The results were tested for evidence of a meaningful

difference in the extent of revenue exposure to financial price risk across the sectors. The result was significant (chi-square =24.456, p-value=0.0000, see Appendix 3). There was strong evidence to suggest that, on average, firms in each industry group have different sized consolidated revenue exposure to financial price risk.

5.1.4 Extent of Cost Exposure

The manufacturing sector indicated the highest consolidated cost exposure, on average, to financial price risk. 69% of respondents from the manufacturing sector reported that more than 30% of consolidated costs were exposed to financial price risk. Respondents from the services industry experienced the lowest exposure with 80% indicating less than 30%. 83% of respondents from the primary industry group reported consolidated cost exposure of 10-39%.

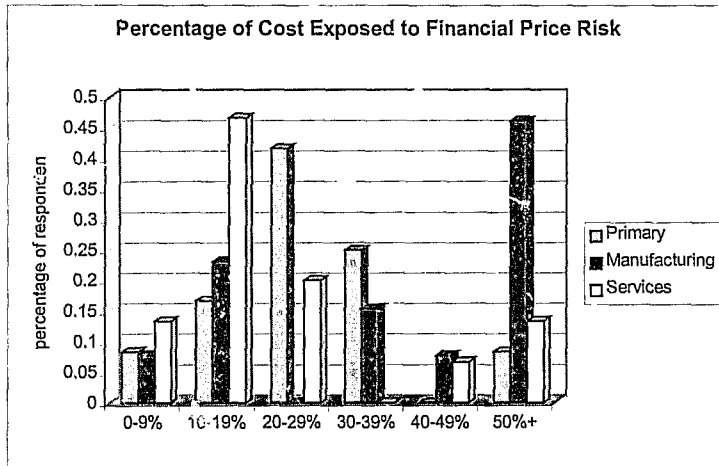


Figure 5.3 Extent of Cost Exposure by Industry Sector

The 'chi-square' test yielded a significant result (chi-square =27.692, p-value=0.0000, see Appendix 3) which supported that, on average, firms in each industry group have different sized consolidated cost exposure to financial price risk.

5.1.5 Concern with Types of Exposure

This question attempted to determine the degree to which different types of exposures concerned respondents. Accounting exposures refer to transaction exposures arising from contractual commitments. Translation exposure more specifically

refers to exposure upon conversion of foreign denominated costs or revenues into domestic currency. Contingent exposures refer to exposures arising from changes in financial prices that affect the firm value through future transactions.

The results indicated that respondents across all industries were most concerned for contingent exposures with 68% of respondents indicating 'Moderate' to 'High' concern.

Table 5.1 shows the percentage of respondents indicating their degree of concern for each exposure.

The 'chi-square' test was performed to determine whether there was, on average, any difference across industry groups in the degree of concern respondents experienced for each type of exposure. There was no evidence to suggest that firms in each industry group have a different degree of concern for translation, and contingent exposures (chi-square =0.605, p-value=0.962 and chi-square=5.800,p-

value=0.215 respectively, see Appendix 3). The test indicated significant difference between each industry sector in the degree of concern for accounting exposure (χ^2 -square=18.078, p-value=0.001, see Appendix 3). The manufacturing sector showed higher concern than primary and services industries.

<i>All Sectors</i>	No Concern	Low	Moderate	High
a.Accounting Exposures	10%	38%	20%	33%
b.Translation Exposures	15%	35%	30%	20%
c.Contingent Exposures	5%	28%	40%	28%

<i>Primary</i>	No Concern	Low	Moderate	High
a.Accounting Exposures	8%	33%	33%	25%
b.Translation Exposures	8%	42%	33%	17%
c.Contingent Exposures	8%	33%	33%	25%

<i>Manufacturing</i>	No Concern	Low	Moderate	High
a.Accounting Exposures	8%	15%	23%	54%
b.Translation Exposures	8%	38%	31%	23%
c.Contingent Exposures	0%	15%	46%	38%
<i>Services</i>	No Concern	Low	Moderate	High
a.Accounting Exposures	13%	60%	7%	20%
b.Translation Exposures	27%	27%	27%	20%
c.Contingent Exposures	7%	33%	40%	20%

Table 5.1 Concern with Types of Exposure by Industry Sector

5.1.6 Rationale for Financial Price Risk Management

The final question in Part A of the questionnaire required respondents to rank the importance of a number of factors in their decision to manage financial price risk. Table 5.2 shows the percentage of respondents that allocated a rank on a scale of 1-5 (most important to least important) to each factor.

Where

- A. tax benefits arising from the management of future income streams
- B. reduction in the probability of financial distress
- C. economies of scale in the use of risk management instruments
- D. reduction in the cost of finance
- E. reduction in agency costs (conflict between shareholders and management)

Factor	Rank				
	1	2	3	4	5
A.	13%	10%	38%	23%	18%
B.	70%	20%	3%	8%	0%
C.	0%	8%	35%	38%	20%
D.	15%	55%	10%	15%	5%
E.	0%	8%	15%	20%	58%

Table 5.2 Rank of Factors in Decision to Manage
Financial Price Risk (all sectors)

A simple 'measure the location of the responses' was used to analyze the data (see appendix 3). The responses ranging from 1 to 5 were ordinal measures and corresponded to the level of importance of each statement, so an 'average response' could be calculated. This average was considered to be a reasonable reflection of the importance attached to each statement.

Respondents across all sectors ranked the factors, on average, as follows:

<u>Factor</u>	<u>Rank</u>
A. Tax benefits	3
B. Probability of financial distress	1
C. Economies of scale	4
D. Cost of finance	2
E. Agency costs	5

Analysis of the data was conducted to determine if there was any meaningful difference in the rankings allocated to the factors across industry groups. The results showed no significant difference between each industry sector in their decision to manage financial price risk in B, D and E (chi-square = 0.997, 5.031, 6.091, p-value = 0.607, 0.284, 0.192 respectively). There was a significant difference between each industry sector in A and C (chi-square = 12.783, 11.031, and p-value = 0.012, 0.026 respectively, see Appendix 3).

Further investigation of the data, using ordinal logistic regression, revealed that in A, the difference between the primary and the manufacturing industry respondents was insignificant. There was a

significant difference between primary and services, and the manufacturing and services industry (see Appendix 3). The services industry believed factor A was more important than respondents from the other sectors.

5.2 Non-Derivative Risk Management Approaches

The second part of the questionnaire examined the extent of the awareness, and usage, of non-derivative financial price risk management approaches by respondents.

5.2.1 Awareness of Non-Derivative Risk Management Approaches

The data suggested that 95% of respondents across all industry groups were aware of at least one non-derivative risk management approach (NDRMA).

Table 5.3 presents the extent of the awareness of NDRMA by industry sector. Where:

- A. Risk sharing arrangements
- B. Balance sheet restructuring

- C. Issuance of preference stock
- D. Issuance of convertible debt
- E. Dividend restrictions
- F. Geographical and/or vertical diversification
- G. Other approaches not involving the use of derivatives

NDRMA	Industry Sector		
	Primary	Manufacturing	Services
A.	66.7%	61.5%	46.7%
B.	100.0%	46.2%	86.7%
C.	58.3%	42.3%	73.3%
D.	66.7%	84.6%	66.7%
E.	41.7%	34.6%	60.0%
F.	75.0%	100.0%	73.3%
G.	0.0%	7.7%	13.3%

Table 5.3 Awareness of NDRMA (by industry groups)

Respondents from the service and primary industry sectors indicated that balance sheet restructuring was the most widely recognised NDRMA. Respondents from the manufacturing industry indicated that diversification was the approach they were most familiar with. Respondents in the primary and manufacturing sectors indicated that dividend

restrictions were the NDRMA they were least familiar with. Service sector respondents were least aware of risk sharing arrangements.

Figure 5.4 shows the degree of awareness (in percentage form) of each non-derivative risk management approach across all industry sectors. Across all industry groups, balance sheet restructuring (90% of respondents), diversification (82.5%), issuance of convertible debt (72.5%), and issuance of preference stock were the most widely recognised non-derivative risk management approaches.

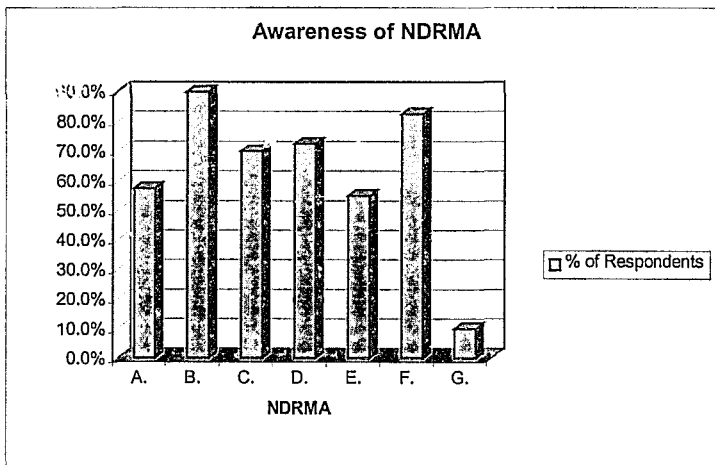


Figure 5.4 Awareness of NDRMA (all respondents)

5.2.2 Extent of the Use of NDRMA

Respondents were asked to indicate what proportion of their exposures to financial price risk were managed by NDRMA. The results are presented in Figure 5.5 (for all respondents) and Figure 5.6 (by industry sector).

42.5% of all respondents indicated that 0-19% of financial price exposures were managed by NDRMA. 32.5% of respondents managed 20-39% of financial risk by NDRMA. Only 25% managed more than 50% of financial risk by NDRMA.

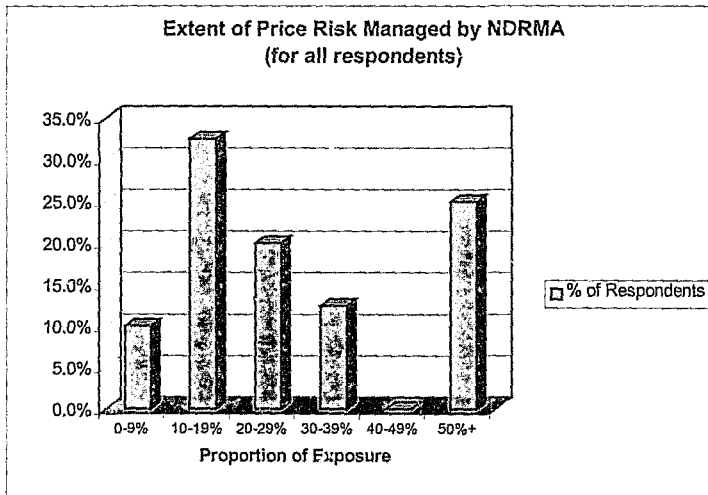


Figure 5.5 Price risk managed by non-derivative risk approaches (all respondents)

Further investigation of the data revealed in the primary and manufacturing industries, 17% of respondents managed more than 50% of financial risk by NDRMA, while 83% managed less than 40% of their financial price risk by NDRMA.

Respondents from the services sector revealed the greatest use of NDRMA. 60% of respondents managed 10-39% of the financial price risk by NDRMA, and 40% managed more than 50% financial risk by NDRMA.

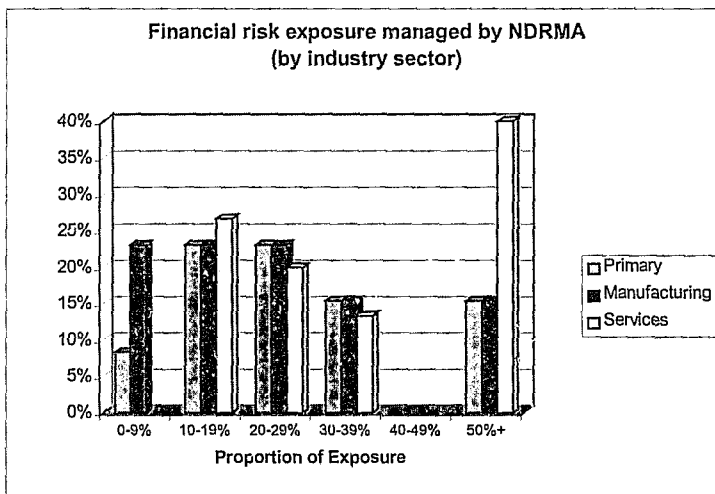


Figure 5.6 Price risk managed by non-derivative risk approaches (by industry sector)

5.3 Use of Derivatives

The data acquired in this part of the questionnaire was used to determine the extent of the use of derivatives by respondents. Respondents were also asked to rank the factors in their decision not to use derivatives.

Data obtained in this section also provided insight to the types of derivatives used by firms and changes in the intensity of the usage of derivatives.

5.3.1 Extent of the Use of Derivatives

90% of respondents indicated that they were users of the derivatives (forwards, futures, swaps, options or other exotic structures). Figure 5.7 presents the extent of derivative usage by industry group.

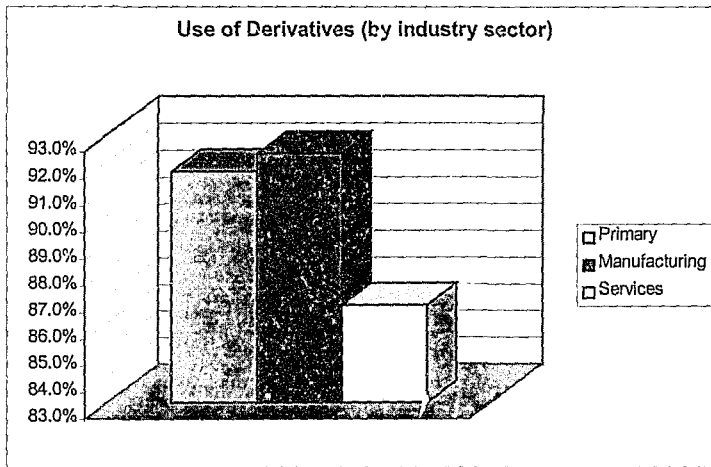


Figure 5.7 Derivative Use (by sector)

The results indicated that 91.7% of respondents from the primary industry group were users of derivatives, while from the manufacturing and services sectors 92.3% and 86.7% were users respectively.

5.3.2 Non-use of Derivatives

Non-users of derivatives were required to rank a number of factors influencing their decision. 50% of respondents ranked 'Insufficient exposure to financial prices' and 'Costs of establishing and maintaining a derivatives program exceed benefits' as the most important influences.

Respondents indicated that other means of managing financial price risk, and concerns about public/shareholder/regulator perceptions of derivatives were less important factors in their decision not to use derivatives.

Difficulty in pricing and evaluating derivatives, disclosure requirements, and accounting treatment were considered to be the least important factors in their decision not to use derivatives.

Subsequent questions were directed at users of derivatives only.

5.3.3 Type of Derivatives Used

This question focused on extracting data on the extent of the use of exchange traded and over-the-counter (OTC) derivatives.

64% of users indicated that 0-9% of the derivatives used were exchange traded instruments. 6% of users indicated that exchange traded derivatives accounted

for 10-19% of overall derivative use, while 8% and 22% of respondents indicated exchange traded derivatives constituting 20-29% and more than 50% respectively.

The majority, 77% of users indicated that more than 50% of the derivatives used were OTC instruments. 17% of users indicated that OTC instruments accounted for 0-9% of overall derivative use, while 6% of respondents indicated OTC instruments constituting 30-49% of derivatives use.

5.3.4 Intensity of the Usage of Derivatives

Users of derivatives were asked whether the intensity of their use of derivatives had changed over the last year. It was suggested that users evaluate the change in intensity on the basis of the change in the notional value of derivative contracts employed in the current and previous year.

Figure 5.8 indicates that 39% of respondents increased the intensity of their usage compared to

last year, 8% decreased and for 53% of respondents the intensity of their usage remained constant.

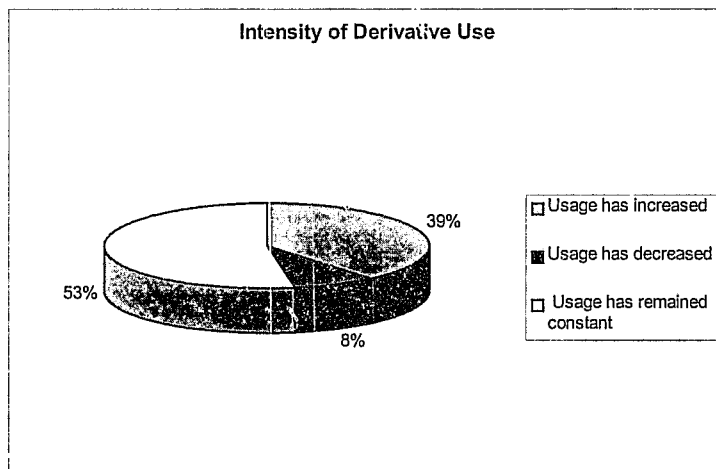


Figure 5.8 Change in Intensity of the Use of Derivatives

5.4 Management of Derivatives Risk

This part of the questionnaire focused on acquiring data related to the nature of the use of derivatives and management of the risks associated with the use of derivatives.

5.4.1 Control of the Use of Derivatives

Question 11 required users of derivatives to indicate which statement best described how their organisation controlled the use of derivatives to manage different types of financial price risk.

Across all financial price risk types, 66% of derivative users described their risk management activities as being centralised, followed by 9% who described risk management activities as being decentralised with centralised coordination (illustrated in Figure 5.9). Only 1.39% of users described their control of derivative activities as being primarily decentralised. This figure was largely influenced by the 5.56% of respondents that described the use of derivatives for commodity price risk management as being primarily decentralised.

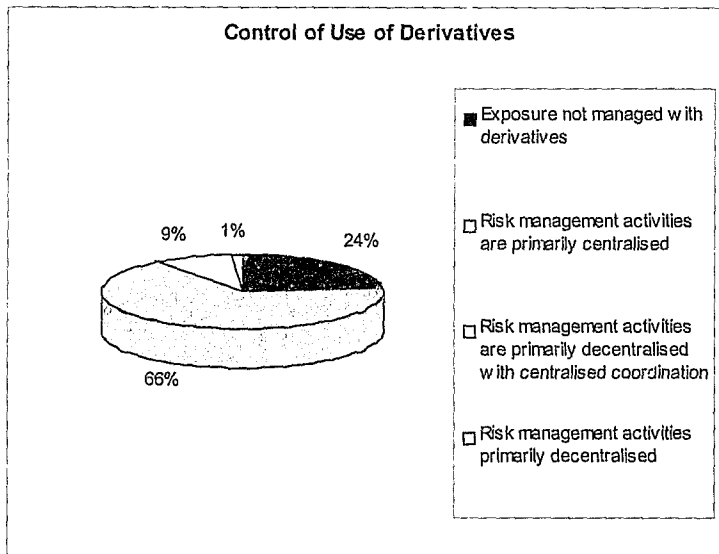


Figure 5.9 Control of the Use of Derivatives (across all financial price risks)

Table 5.4 provides a breakdown of the control of the use of derivatives for each type of financial price risk. Where:

- A. Exposure not managed with derivatives
- B. Risk management activities are primarily centralised
- C. Risk management activities are primarily decentralised with centralised coordination
- D. Risk management activities primarily decentralised

Notably, 88.9% of the users of derivatives reported that derivative activity to manage interest rate risk was primarily centralised. This figure was 69.4% for foreign exchange risk and 66.7% for commodity price risk.

61.1% of derivative users indicated that equity price risk was not managed using derivatives.

	Type of Financial			
	Price Risk			
	<i>Foreign</i>	<i>Interest</i>	<i>Commodity</i>	<i>Equity</i>
	<i>Exchange</i>	<i>Rate Risk</i>	<i>Price Risk</i>	<i>Price</i>
Control of the	<i>Risk</i>			<i>Risk</i>
Use of				
Derivatives				
A.	11.1%	5.6%	16.7%	61.1%
B.	69.4%	88.9%	66.7%	38.9%
C.	19.4%	5.6%	11.1%	0.0%
D.	0.0%	0.0%	5.6%	0.0%

Table 5.4 Control of the Use of Derivatives for the Management of Financial Price Risk

5.4.2 Type of Hedging Activities

Users of derivatives were asked to indicate the type of hedging activities undertaken.

Figure 5.10 illustrates the proportion of derivative users engaging in each type of hedging activity.

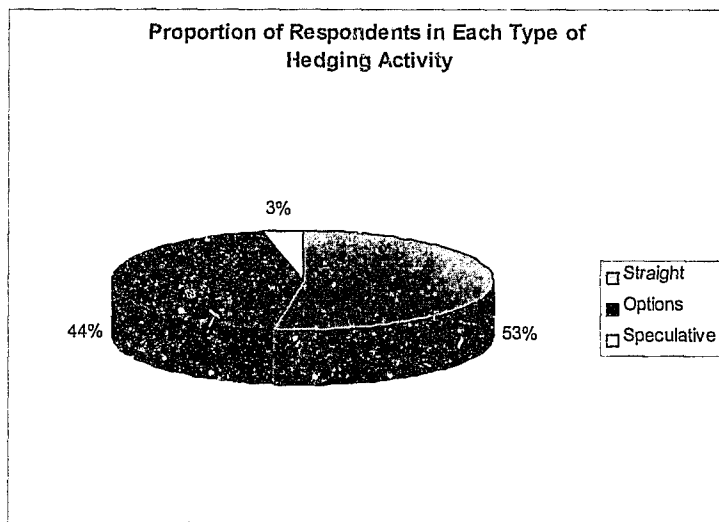


Figure 5.10 Proportion of Respondents in Each Hedging Activity

5.4.3 Issues and Risks Associated with the Use of Derivatives

Question 12a in this section of the questionnaire attempted to determine the degree of concern with a number of highly publicised issues relating to the use of derivatives.

Issues

Respondents were asked to rank their degree of concern with issues on a scale of 1 to 6 (where 1 indicated the most concern and 6 indicated the least concern). The same ranking process was used in Question 5 (Part A). A simple 'measure the location of the responses' was used to analyze the data (see Appendix 3). The responses ranging from 1 to 6 were ordinal measures and corresponded to the level of importance of each statement, so an 'average response' could be calculated. This average was considered to be a reasonable reflection of the importance attached to each statement.

<u>Issue</u>	<u>Rank</u>
A. Market risk	1
B. Counter-party (credit risk issues)	2
C. Legal /regulatory issues	4
D. Operational risks	3
E. Reaction by analysis or investors	5
F. Secondary market liquidity	6

Risks

Question 12b, attempted to determine the degree of concern with the specific risk considerations involved in the selection of a particular derivative instrument. The rankings are presented below.

<u>Issue</u>	<u>Rank</u>
A. Correlation risk	1
B. Ratio risk	5
C. Execution risk	3
D. Liquidity risk	2
E. Model risk	6
F. Judgement risk	4

One of the aims of this study was to determine

whether users of derivatives had adopted appropriate structures and practices to manage the risks associated with the use of derivatives. Questions 13 to 18 examined various aspects of internal control with regards to the use of derivatives.

5.4.4 Derivatives Control and Reporting

89% of derivative users have a documented policy relating to derivatives use. 91% of these firms reported that the Board of Directors mandated the policy.

72% of users indicated that derivative activity was reported monthly. Figure 5.11 illustrates the breakdown of the frequency with which derivatives activity was reported to the Board of Directors.

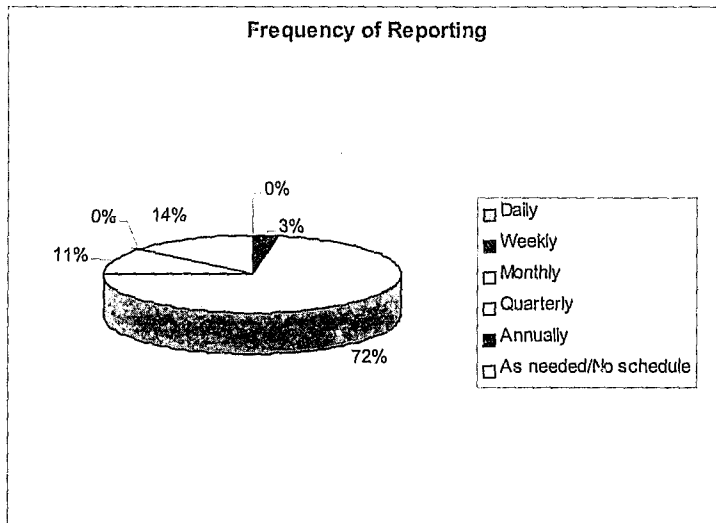
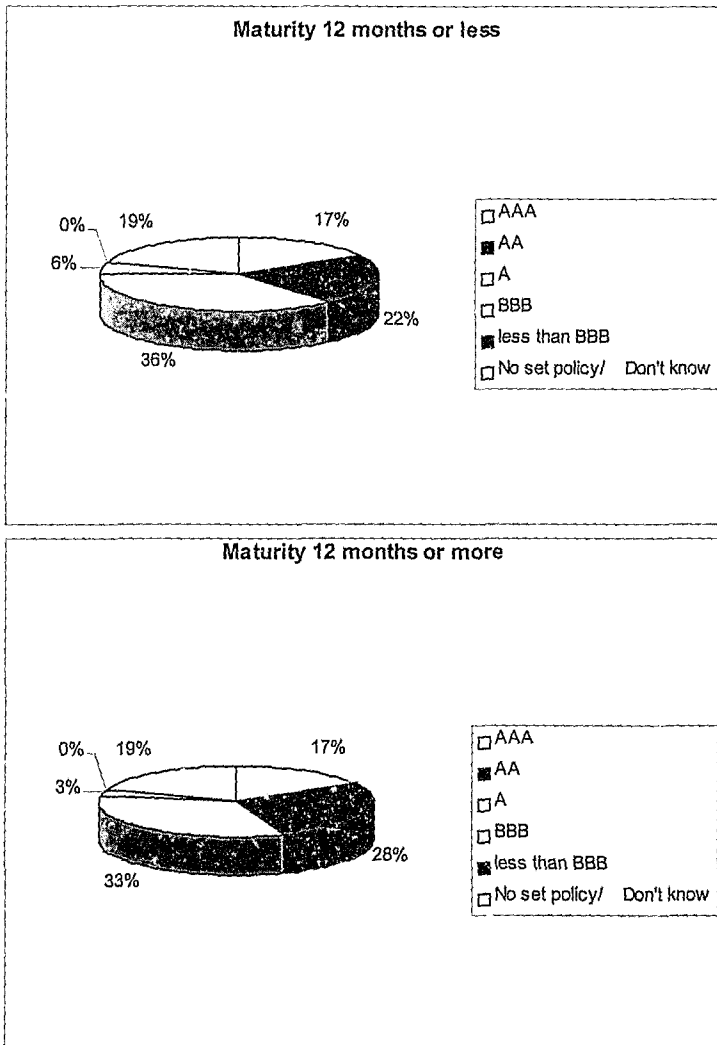


Figure 5.11 Frequency of Reporting of Derivatives Activity

5.4.5 Management of Counter-party Risks

Credit Rating

In Question 14 users of derivatives were asked to indicate the lowest credit rating required from a counter-party to enter into a derivatives transaction for a period less than 12 months, and greater than 12 months.



**Figure 5.12 Minimum Counter-party Credit Ratings for
> 12 Month and < 12 Month Transactions**

For maturity 12 months or less, 36% of respondents required a minimum counter-party credit rating of A before entering into a derivative transaction. 17% of respondents required a minimum rating of AAA, AA (22%), BBB (6%), and 19% did not know or did not have a set policy.

For maturity 12 months or more, 33% of respondents required a minimum counter-party credit rating of A before entering into a derivative transaction. 17% of respondents required a minimum rating of AAA, AA (28%), BBB (3%), and 19% did not know or did not have a set policy.

The chi-square test was conducted to determine whether there was any significant difference in the minimum counter-party credit rating required for derivative transactions of longer duration. The result was not significant (chi-square = 1.191, and p-value = 0.880, see Appendix 3). There was no evidence to suggest a significant difference between the minimum credit ratings respondents require

before entering into a derivative transaction for "12 months or less" and for "12 months or more".

ISDA Documentation

Question 15 asked users whether the International Swaps and Derivatives Association (ISDA) documentation was used in dealings with counterparties.

75% of respondents indicated that ISDA documentation was used in over-the-counter (OTC) derivative transactions.

5.4.6 Valuation of Derivatives

Use of "value-at-risk" Measure

38% of users indicated in Question 17 that "value-at-risk" (VAR) was calculated for some or all of their derivative portfolios.

Frequency of Valuation

Question 17 required respondents to indicate the frequency of the valuation of derivative portfolios.

The results, shown in Figure 5.13, indicate that for 17% of users, derivatives were valued daily, and for 11% quarterly. The largest single percentage, 55%, however, reported that valuation of the firm's derivatives portfolio was monthly.

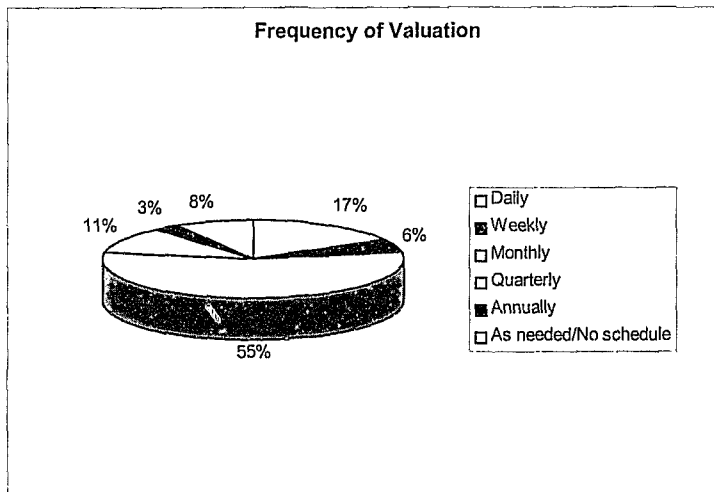


Figure 5.13 Frequency of Valuation of Derivatives

Source of Valuation

Question 18 explored the relative importance of 3 ways in which firms obtained valuations of their derivative portfolio.

39% of users indicated that they were most reliant on internal sources for valuation of their portfolio

of derivatives. 33% of users ranked the originating dealer as source upon which they are most reliant, followed by 28% of users who ranked another dealer/vendor/consultant as most important.

Using the average ranking method in earlier analyses, it was determined that the dealer that originated the transaction was the primary source for valuing derivatives.

<u>Source</u>	<u>Rank</u>
A. Dealer that originated the transaction	1
B. Another dealer/consultant/vendor	2
C. Internal source	3

5.5 Impact of Accounting Standards

Issues relating to the disclosure of information on the use of derivatives were examined in this part.

5.5.1 Effect of Disclosure Requirements on the Use of Derivatives

Respondents were asked to indicate what impact AASB 1033/AAS 33 rules (disclosure of the use of derivatives) would have on the extent of the use of derivatives by their organisation. The results are presented in Figure 5.14

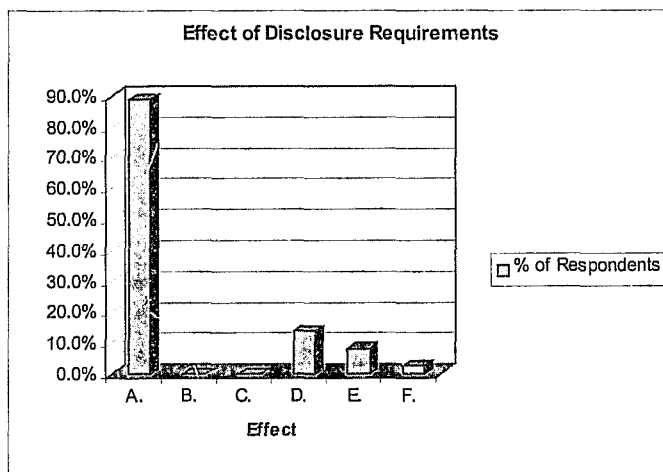


Figure 5.14 Issues that Relate to the Public Disclosure of Derivatives

Where

- A. No affect on derivatives use or risk management strategy
- B. Reduction in the use of derivatives
- C. An increase in the use of derivatives
- D. A change in the type of derivative instruments used
- E. Alteration in the timing of hedging transactions
- F. A significant change in the firms use of derivatives and/or risk management strategy

89% believed that additional disclosure requirements would have no affect on the extent of the use of derivatives or overall risk management strategy of the firm. 14% believed there would be a change in the type of derivative instruments used

No respondents indicated that disclosure requirements would lead to a reduction in the use of derivatives.

5.5.2 Issues Related to Disclosure of the Extent of the Use of Derivatives

Finally, Question 20 required respondents to indicate which factor, of a number listed, was an issue related to the public disclosure of the extent of the use of derivatives by their firm.

Figure 5.15 indicates the proportion of respondents that believe each factor to be an issue relating to the public disclosure of the use of derivatives.

Where:

- A. Places your firm at a competitive disadvantage
- B. Does not reveal any useful information in terms of your firms risk profile
- C. Is open to misinterpretation
- D. May create shareholder/manager conflict
- E. None of the above/Other

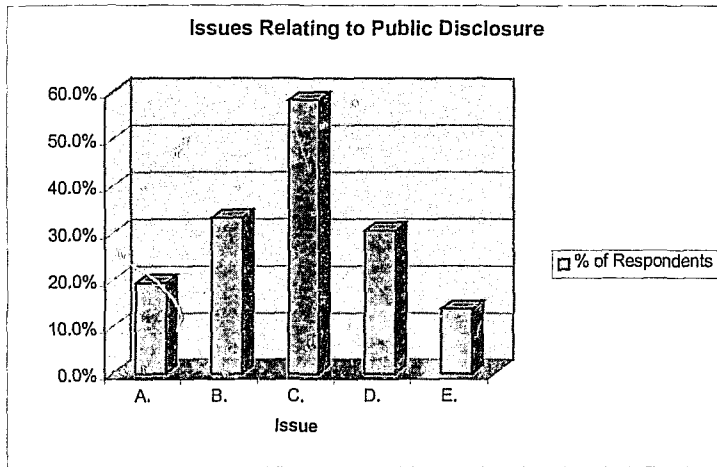


Figure 5.15 Issues that Relate to the Public Disclosure of Derivatives

58% of respondents believed that misinterpretation (C) was an issue relating to the public disclosure of use of derivatives. 33% and 31% of respondents indicated that disclosure did not reveal any useful information relating to the risk profile of the firm, and may create shareholder/manager conflict, respectively.

CHAPTER 6: Interpretation of Results

The response rate of 26.7% is considered to be reasonable when compared to the response rates to similar surveys. Bodnar, Marston & Hayt (1998) reported in a survey conducted at Wharton School, a 20.7% response rate in the United States from a randomly selected sample of 1928 firms, and Bodnar & Gebhardt reported a 34.2% response rate from a random sample of 368 companies in Germany. In South Africa, Merrifield (1998) reported a response rate of 22% from a judgmental sample of 300.

These surveys offer benchmarks against which to compare the results of specific sections of this survey. The major limitation to the extent of the comparability, however, is the difference in sampling techniques.

6.1 Background Information

6.1.1 Extent of Exposure to Financial Price Risk

Respondents were asked to indicate the extent of their revenue and cost exposure to financial price risk (that is the percentage of their consolidated revenue and cost not protected against fluctuations in financial prices).

This survey did not attempt to attribute the extent of the cost or revenue exposures to any specific financial price risk but found a difference in the extent of revenue and cost exposure to financial price risk across industry sectors.

Respondents from the primary industry sector reported the largest revenue exposure to financial price risk. Firms involved in manufacturing activities reported larger cost exposure to financial price risk than from the primary and services sector firms respectively.

In the absence of firms that are engaged in financial services with larger exposures to interest rates and equity price risks, it seems to be a reasonable result that firms in the primary and manufacturing industry with exposure to commodity prices and exchange rates report the largest exposures. This result is also consistent with the view that firms from the primary industry derive most revenue exposure from commodity prices and exchange rates, and manufacturing firms face greater cost exposure to fluctuating input prices.

6.1.2 Concern with Types of Exposure

Respondents were asked to indicate the degree of concern over different types of exposure. Firms across all industries reported the greatest concern for contingent exposures, followed by accounting and translation exposures.

Manufacturing firms reported significantly greater concern for accounting exposures (Appendix 3). This would seem to suggest that these firms are more concerned with exposures arising from contractual

commitments. A possible reason for this is that manufacturing firms may face exposures resulting from contractual commitments relating to costs (input prices) and revenues (output prices).

The results did not indicate a significant difference in the degree of concern for contingent exposures across sectors. The results indicate that firms with larger cost or revenue exposure (manufacturing and primary industry firms respectively as indicated in Section 6.1.1) do not experience a higher degree of concern over the future value of transactions.

This would seem to suggest that the relative size of exposures should be viewed with caution in attempting to determine the extent of hedging activities that may be undertaken by a firm.

One view on the poor relationship between the relative size of exposures and extent of hedging activity is that the directors of the firm may intentionally choose not to completely hedge out

exposure to prices. The fiduciary responsibility of the directors of the firm does not extend to the complete negation of risk, since shareholders will manage their portfolio risk through diversification. This unhedged residual exposure to future price movements may fall within the limits of the tolerance for risk expressed by shareholders whom inherently assume responsibility for this price risk when investing in a firm.

This commentary does not contradict the results of Nance, Smith & Smithson (1991), Wall & Pringle (1989) and Block & Gallagher (1986) who reported a statistically significant positive relationship between firm size and the extent of hedging activity undertaken by the firm. These researchers were primarily concerned with the relationship between absolute size of the firm (using measures such as market capitalisation or gross earnings).

6.1.3 Rationale for Financial Price Risk Management

The section deals with Proposition 1 of this paper in which it is proposed that 'the reduction of the probability of financial distress is the most important influence in the decision to manage financial price risk.'

70% of all respondents ranked 'the reduction of the probability of financial' distress as the most important factor, followed by 15% who ranked 'reduction in the cost of finance' as the most important factor. 'Tax benefits arising from the management of future income streams' was ranked as the third most important factor.

The results indicate that respondents rank "reduction of the probability of financial distress" as the most important factor thus supporting Proposition 1.

The results also seem to suggest that respondents are primarily concerned with managing the volatility of cash flows (which reduce probability of financial

distress and the cost of finance) over managing the volatility accounting earnings (tax benefits from management of future income streams). These results are in contrast to the finding by Merrifield (1998) in South Africa Bodnar & Gebhardt (1998) in Germany where 64% and 55.3% of respondents respectively indicated that the management of the volatility of accounting earnings was the primary concern. The Australian experience is, however, supported by the findings of Bodnar et al. (1998) in the United States.

A possible reason for the high level of importance attached to the management of the volatility of accounting earnings may be that they matter to managers because of the relevance of accounting earnings to analysts perceptions and predictions of future earnings and because of their relevance in management compensation.

6.2 Non-Derivative Risk Management Approaches

(NDRMA)

The second part of the questionnaire examined the extent of the awareness, and usage, of non-derivative financial price risk management approaches by respondents.

6.2.1 Awareness of NDRMA

95% of respondents were aware of at least one non-derivative risk management approach (NDRMA). The greatest proportion of respondents indicated an awareness of balance sheet restructuring, diversification and issuance of convertible debt respectively.

Across industry groups, balance sheet restructuring and diversification was most widely recognised by respondents from the primary industry. Manufacturing firms reported greatest awareness of diversification and issuance of convertible debt respectively, while firms from the services sector the showed most

widespread awareness of balance sheet restructuring, diversification and issuance of preference stock.

Given the historic use of diversification, balance sheet restructuring, and the issuance of preference shares and convertible debt, it seems reasonable that they were most widely recognised among respondents.

The awareness of risk sharing arrangements was lower than anticipated. Primary industry firms reported greater awareness of this NDRMA that may be reflective of the fact that risk sharing arrangements are well suited to the management of exchange rate and commodity price risk.

6.2.2 Extent of the Use of NDRMA

The extent of the usage of specific NDRMAs was not queried, however the data analysis did indicate that only 25% of respondents managed more than 50% of financial price risk with NDRMA.

This was largely influenced by the 40% of services sector firms that managed more than 50% of financial price risk with NDRMA. A possible reason for the relatively high use of NDRMA by services firms may be the nature of their product and the inputs. In the absence of financial services firms, the respondents from the services sector typically deal in human capital rather than physical products therefore such firms use more innovative NDRMA to manage their price exposures.

6.3 Use of Derivatives

This and the subsequent section deals with information concerning Proposition 2 in which it is proposed that 'the predominant motivation for the use derivatives is the management of risk'.

6.3.1 Extent of the Use of Derivatives

90% of respondents indicated that they were users of derivatives (forwards, futures, swaps, options or other exotic structures). This result appears to be considerably higher than the 57% and 78% obtained by Bodnar *et al* (1998) and Bodnar & Gebhardt (1998) in

the United States and Germany respectively. This may be attributable to the bias in the Australian sample. Firms were selected from each non-financial services sector on the basis of market capitalisation. Larger firms in the US survey (in terms of market capitalisation) indicated an 83% derivative usage rate.

Across industry sectors, respondents from the primary and manufacturing sectors indicated the most widespread usage of derivatives. 87% of services sector firms reported using derivatives, which despite being the least for Australian sectors, is considerably higher than the 1998 Wharton Survey in the US. Given that futures exchanges were initially developed to manage commodity price risk, it is not surprising that primary industry firms report high usage.

It seems reasonable to suggest that the relative isolation of Australia and the exposure to exchange rate risks in a highly internationalised economy may

be factors influencing the extent of the use of derivatives among firms in all the sectors.

6.3.2 Non-use of Derivatives

Given the relatively small proportion of respondents that indicated non-use of derivatives, the potential to extract meaningful insight to why firms choose not to use derivatives is limited

50% of non-users ranked 'insufficient exposure to financial price risks' and the 'costs of establishing and maintaining a derivatives program exceed benefits' as the most important factors. The perception of shareholders with regards to the use of derivatives was considered to be a less important concern. These findings are consistent with those in the 1998 Wharton School Survey where 60% of firms reported not using derivatives because their exposures were too small. In that survey, other means of managing the exposures was considered to be the next most important factor, followed by the costs of hedging exceeding the expected benefits.

This seems to suggest that the decision not to use derivatives is motivated more by the financial benefits of the use than shareholder perceptions.

The results also seem to indicate that firms do not perceive an inability to manage a derivatives program. Non-users considered the 'difficulty in pricing and evaluating derivatives' and the 'accounting treatment' of derivatives as the least important factors.

6.3.3 Types of Derivatives Used

Users of derivatives indicate greater use of over-the-counter (OTC) derivative instruments than exchange traded instruments. 64% of users indicated that less than 10% of derivatives used are exchange traded, while 77% indicated that more than 50% of derivatives used are OTC instruments.

One reason for the popularity of OTC instruments over exchange traded instruments may be the ability to structure such instruments to meet the specific requirements of the end user. Another reason may be

that a lack of derivative exchanges for specific underlying instruments or illiquidity in existing exchanges force firms to use OTC instruments.

OTC instruments expose these users to a vast array of other risks related to counter-parties and secondary market liquidity that is dealt with in Section 6.3 and 6.4.

6.3.4 Intensity of Derivatives Usage

39% of users reported unchanged usage, while 53% and 8% reported increased and decreased usage respectively, as measured by the change in the notional value of derivative contracts. These results are consistent with the findings in the 1998 Wharton School survey.

The change in the intensity of the use of derivatives seems to suggest that the experience with the use of derivatives has been positive for most firms as they have either maintained or increased the level of the use of derivatives.

Recent changes in the environment in which firms operate have been aimed at curbing the use of derivatives for speculative purposes and may arguably be reflected in the reduced incidence of 'derivative disasters' in the last year. Derivative disclosure requirements by Australian Accounting Standards Board and the increased internal vigilance by company auditors seems to suggest that firms using derivatives would be more likely to be using them under strict controls for risk management rather than for speculative trading activities.

6.3.5 Hedging Activities

53% of users indicated that derivatives are used for 'straight hedging' where the payoffs on the derivative exactly offset those on the underlying asset. 44% reported the use of 'options hedging' and 3% reported 'speculative hedging'.

This result seems to suggest that firms are conservative in their use of derivatives, however the response of users to this part of the questionnaire must be viewed with some scepticism

since the exact extent of the speculative derivatives may be understated due to negative public perceptions of speculative activities. 44% of users report 'options hedging' where there are asymmetric payoffs and where exposures may arise from unequally matched positions in the underlying instrument. The opportunity for speculation is inherent in any option position.

Proposition 2 that 'the predominant motivation for the use derivatives is the management of risk' appears to be supported by

- the use and non-use of derivatives being motivated by financial considerations that suggests unless the use of derivatives can yield positive expected returns they will not be used;
- the intensity of derivative use remaining constant or increasing despite anti-speculative sentiment in an environment of greater uncertainty, broader disclosure requirements, and internal policing;
- and

" the indication that 'straight hedging' is the predominant activity involving the use of derivatives

6.3.6 Issues and Risks Associated with the Use of Derivatives

This section deals with Proposition 3 in which it is proposed that 'counter-party credit risk is the issue that most concerns the users of derivatives'.

Respondents to the survey ranked 'market risk' as the most serious issue relating to the use of derivatives. 'Counter-party credit risk' was ranked second, followed by 'operational risks', 'legal/regulatory issues', 'reaction by analysts or investors' and 'secondary market liquidity'.

Residual concern from the 'Asian economic crisis' where a number of Australian institutions suffered from unforeseen declines in the value of positions denominated in Asian currencies may be one reason for the relatively high ranking attributed to market risk.

The 1998 Wharton School survey ranked, in order of the degree of concern by users, the issues as follows:

1. Accounting treatment
2. Market risk
3. Monitoring/Evaluating hedge results
4. Credit risk
5. Secondary market liquidity
6. SEC disclosure requirements
7. Reaction by analysts/investors

Notably, the Australian respondents indicated greater concern with credit risk than their US counterparts. This may also be attributable to the impact of the Asian economic problems.

In the 1995 Wharton School survey ranked credit risk as the issue that caused the most concern. The implementation of improved credit risk management practices in the United States and the dramatic decrease in the number of derivatives related disasters in the period post-1995 compared to pre-

1995 may explain the dramatic reduction in the concern for this issue over the two surveys. Merrifield (1998) proposed that the low concern for credit risk by South African firms was attributable to the fact that no highly publicised counter-party defaults had occurred in South Africa prior to the South African survey. These factors may have influenced the degree of concern with credit risk expressed by Australian respondents.

The Australian firms ranked operational risks as the third most important issue. Assuming that respondents consider operations to include accounting functions, the accounting treatment of derivatives appears to be of far greater concern to US firms. Bodnar et al (1998) attributed the high ranking of 'accounting treatment' to the release of the FASB draft proposal for a new accounting standard for the measurement and reporting of derivatives in August 1997 prior to the 1998 Wharton School survey. The Australian accounting standard with regards to derivatives reporting was implemented in 1996.

The relatively low ranking of secondary market liquidity in the Australian survey is interesting in the context of the most recent major derivatives related financial crisis. Long Term Capital Management, a US based hedge fund was bailed out under instruction from the US Federal Reserve following difficulties which were exacerbated by poor secondary market liquidity. Given the greater use of OTC derivative instruments by Australian firms and the associated liquidity concerns with such instruments, it seems reasonable to have expected that this issue would be ranked more highly. The relatively low degree of concern with this issue may be seen to be supportive of the Proposition 2 that the use of derivatives by Australian non-financial services firms is driven by the need for risk management rather than for trade-ability that may be indicative of speculative activity.

Respondents ranked correlation risk as the most significant risk, followed by liquidity risk,

execution risk, judgement risk, ratio risk and model risk.

Liquidity risk is the second most important consideration in selecting a specific instrument, but users of derivatives indicated that secondary market liquidity is the issue of least concern relating to the use of derivatives. This pattern of response would seem to suggest that users of derivatives engage in consideration of liquidity risk in the selection of derivative instruments to reduce future liquidity concerns.

Judgement risk is considered to be fourth most important risk. Given that a number of derivative disasters have been attributable to failings of the judgement of individual officers in the selection of instruments, it would be reasonable to expect this risk to be considered more important. Respondents do, however, express greater concern for execution risks. It would not be unreasonable to suggest that in assessing execution risks associated with a specific derivative instrument firms implicitly

consider the impact of individual decision making on the overall success of a derivative strategy.

6.4 Management of Derivatives Risk

This section deals with information concerning Proposition 4, in which it is proposed that users of derivatives employ the appropriate controls to manage derivatives risk.

6.4.1 Control of the Use of Derivatives

The results revealed that of the firms using derivatives, interest rate (IR) risk is the most commonly managed with derivatives, being done so by 94.5% of users. Foreign exchange (FX) risk is managed by 88.9% of users, followed by commodity price (CP) risk that is managed by 82.3% of users. Equity (EQ) risk is the least commonly managed with only 38.9% of users indicating in the affirmative. Given that IR risk is likely to be faced by most firms this result would seem reasonable.

The 1998 Wharton School survey reported that 83% of derivative users managed FX risk, followed by 76%

for IR risk, 56% for CP risk and 34% for EQ risk. In explaining the higher figures than the US figures in Germany, Bodnar & Gebhardt (1998) propose that the reason is that international operations form a larger part of their activities, thus increasing their exposure and creating a greater incentive to use derivatives to manage the risk. This seems to be a reasonable explanation for the higher results for the Australian firms.

66% of derivative users indicated that risk management activities involving the use of derivatives are primarily centralised, followed by 9% that indicated activities are primarily decentralised with centralised coordination. Only 1.39% of the users of described their control of derivative activities as being primarily decentralised. The results also indicated a high degree of centralised management of the use of derivatives across risk classes, with only exceptions being FX risk and CP risk where 19.4% and 16.7% of firms indicated some degree of decentralised structure.

The high degree of centralisation of the risk management involving the use of derivatives seems to suggest that senior management may be well placed to monitor and supervise derivative activities.

6.4.2 Internal Control and Reporting

89% of users indicated that they have a documented policy relating to derivatives use. This compares favourably to the 1998 Wharton School survey where the corresponding figure was 79%, and the South African survey that reported the existence of such a documented policy for only 56% of users of derivatives. 91% of the Australian firms reported that this policy was a mandate from the Board of Directors.

Respondents were asked to indicate the frequency of reporting of derivative activity to the Board of Directors. 72% of users report monthly, 14% report 'as needed/no set schedule', 11% quarterly, 3% weekly, and no users indicated daily or annually reporting. In the 1998 Wharton School survey 50% of

firms indicated having no set schedule, 23% reported quarterly and 17% reported annually.

These results seem to suggest that control and reporting of derivatives activity in Australian firms is more strict than is the case of firms in South Africa and the United States.

6.4.3 Management of Counter-party Risks

To investigate policies with respect to counter-party credit risk, respondents were asked to indicate the lowest rated counter-party with which the firm would enter a derivative transaction. For maturity less than 12 months, 75% of users require a credit rating of 'A' or better. 19% of derivative users do not have a set policy. For maturity more than 12 months, 78% of users require a credit rating of 'A' or better and 19% of derivative users do not have a set policy.

The 1998 Wharton School survey indicated that 74% of firms required a minimum rating of 'A' for transaction with maturity less than 12 months, and

79% for maturity greater than 12 months. Further analysis however, indicates that Australian derivative users may be more conservative than users in the US. 39% of Australian users require a minimum 'AA' rating for transaction of maturity less than 12 months and 45% for maturity greater than 12 months. In the US the respective figures are 25% and 40%.

This result seems to indicate that while users of derivatives in both countries worry more about counter-party credit risks for longer dated transactions, Australian users are more conservative in dealing with counter-parties to derivative transactions. This may also be a factor contributing to the lower concern with credit risk on derivative transactions as discussed earlier in relation to Proposition 2.

Finally, respondents were asked to indicate whether the International Swaps and Derivatives Association (ISDA) documentation is used in dealings with counter-parties. 75% of users of derivatives responded in the affirmative. Given Australian

regulatory requirements for the use of ISDA in over-the-counter derivative transactions and the extent of the use of OTC derivative instruments indicated earlier, this result seems reasonable. This result would seem to indicate a high degree of awareness by Australian derivative users for the need to reduce counter-party risks by ensuring the legal enforceability of derivative transactions.

6.4.4 Valuation of Derivatives

An important issue in monitoring derivatives is to value them and measure their risk. 55% of users reported that their derivatives portfolio is valued monthly. 17% of users valued their portfolio daily, followed by 11% quarterly. 8% reported 'as needed/no set schedule', 6% weekly and 3% annually.

Two differences in the results of this study and the 1998 Wharton School survey are apparent. Firstly, 16.9% of US derivative users, compared to 8% of Australian users, indicated that the frequency of the valuation of their derivatives portfolio was 'as needed/no set schedule'. Secondly, 55% (includes

16.9% daily and 8.5% weekly) of US users indicated that the frequency of valuation was monthly or more often, compared to 78% of Australian users. According to Bodnar & Gebhardt (1998) 26% of German firms value their portfolio daily, followed by 19.8% that value weekly.

This would seem to suggest that the Australian users of derivatives, while more conservative compared to their US counterparts, are less conservative in the frequency of the valuation of their derivatives portfolio compared to German firms.

39% of users indicated that they were most reliant on internal sources for valuation of their portfolio of derivatives. 33% of users ranked the originating dealer as source upon which they are most reliant, followed by 28% of users who ranked another dealer/vendor/consultant as the most important source. Given the widespread availability of low-cost software for end-user pricing, the extent of the use of internal sources of valuation does not appear to be surprising.

Average rankings reveal that the 'dealer that originated the transaction' is the most important source of valuation, followed by 'another dealer/consultant/vendor', 'internal source. The closeness of the rankings would seem to suggest that firms use some combination of derivative dealers, market quote services, or in-house software interchangeably. The general pattern of responses between firms from the US and Germany is very similar. According to Bodnar & Gebhardt (1998), firms of both countries tend to use some combination of derivative dealers, market quote services, or in-house software most intensively to value their derivatives.

VAR originated as a method for controlling trading risks at banks and financial institutions but has subsequently been marketed to non-financial corporations. 38% of Australian firms indicated that a VAR measure is used. The Wharton School survey found that 44% of US firms used a VAR measure, and more widespread use among large firms and in the

primary products sector.

Two factors may be responsible for the lower use in Australia. Firstly, the VAR concept was initially used in the US financial services firms and there may be a slower rate of adoption by Australian non-financial services firms. Secondly, there may be numerous other risk measures used by Australian firms that have not been tested for in this survey. Stress testing derivatives was found to be the most common choice of risk measure, used by more than 45% of derivative users in the US and Germany. It would seem reasonable to suggest that given the apparently conservative approach to the control of the use of derivatives in Australia, there is also extensive use of other risk measurement approaches.

Bodnar & Gebhardt (1998) suggest that for firms that take a more transaction-by-transaction approach it is not obvious that there are enough benefits to be expected from using more advanced risk measurement approaches. The data acquired in this survey does not permit the testing of the validity of this

statement with regards to Australian non-financial firms.

The validity of Proposition 4 needs to be considered in the context of the risk management guidelines outlined by the Basle Committee (1994) with regards to the use of derivatives by financial firms. The key elements and the basic principles of sound management practice for both dealers and end-users of derivatives instruments are:

- appropriate oversight by boards of directors
- adequate risk management processes that integrate prudent risk limits, sound measurement procedures and information systems, continuous risk monitoring and frequent management reporting; and
- comprehensive internal controls and audit procedures.

The results seem to support Proposition 4 that users of derivatives employ the appropriate controls to manage derivatives risk.

6.5 Impact of Accounting Standards on the Use of Derivatives

This section deals with information concerning Proposition 5, in which it is proposed that accounting disclosure requirements do not influence the decision to use derivatives to manage financial price risk.

In response to the question on the effect of derivative disclosure requirements on the extent of the use of derivatives, 89% of firms indicated there was no effect. 14% of users indicated that there was a change in the type of derivative instruments they would use.

58% of users indicated that details of the use of derivatives are open to misinterpretation. 33% of respondents indicated that disclosure does not reveal any useful information in terms of the risk profile of the firm and 31% suggested that disclosure might cause shareholder/manager conflict.

The responses to Question 19 and Question 20 would seem to suggest that while firms are comfortable with the extent of their use of derivatives, they are concerned by potential negative reactions following disclosure of the details of the derivatives used. In response to this users might change the type of derivative instrument used. This appears to contradict the finding earlier where "reaction by analysts or investors" was ranked as the fifth most important issue with respect to the use of derivatives.

The responses from an overwhelming number of users however, seems to provide support for Proposition 5 that accounting disclosure requirements do not influence the decision to use derivatives to manage financial price risk. The results do seem to suggest that disclosure requirements do influence the type of derivative instrument used.

Chapter 7: CONCLUSIONS

The survey results indicated that the reduction of the probability of financial distress is the most important influence in the decision to manage financial price risk. In support of this, the Australian firms expressed greater concern for managing the volatility of cash flows than the volatility of accounting earnings. This upholds the findings in the United States surveys studied, but contradicts the outcomes of the studies in Germany and South Africa. The reasons for the difference in emphasis across the countries were not explored during this study and might benefit from additional research in the future.

The study indicated that the management of financial price risk is the predominant motivation for the use of derivatives. The results revealed that straight hedging, rather than speculation, is the predominant activity involving the use of derivatives. It was also found that the decision not to use derivatives was primarily motivated by consideration of the

economic costs versus benefits of a derivatives program. This was a marked contrast to the South African survey studied that indicated that optimal risk management practice using derivatives was impeded by a perceived lack of skills.

The Australian survey reflected the residual concern from the 'Asian economic crisis' with market risk being ranked as the most serious issue relating to the use of derivatives. The Wharton School surveys of 1995 and 1998 indicated credit risk and accounting treatment as the most important issues respectively. These results coincided with high rates of counter-party default in the early 1990s and the release of the FASB accounting standards in 1997. This seems to suggest that the ranking of the issues relating to the use of derivatives is highly contextual.

The relatively low ranking of judgement risk in light of the prominence given to the issue of failure in individual decision making in recent derivative related disasters suggests that further

research into the understanding and perceptions of this risk is required.

The results of the survey indicated that Australian non-financial firm are more conservative in their use of derivatives than their United States counterparts and employ appropriate internal controls to manage derivatives risk. The frequency of valuation of derivative portfolios was one area where Australian firms appeared to be less conservative. The absence of substantive literature to against which to assess these findings suggests that there is an opportunity for further research into the optimal frequency of valuation for non-financial firms.

Accounting disclosure requirements were found not influence the decision to use derivatives. Users of derivatives did indicate concern that details of the use of derivatives may be open to misinterpretation and may affect the type of derivative instrument used. This is an area that regulators and shareholders may examine to ensure that optimal risk

management is not impeded by concern with public perceptions stemming from disclosure. Further research focusing on the effects of disclosure on the type of derivative instruments used may be useful to these interest groups.

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APPENDIX 1: DEFINITIONS AND EXTENDED LITERATURE
REVIEW

- a) Types of Financial Price Risk
- b) Theories on Incentives to Manage Financial Price Risk
- c) Types of derivatives
- d) Using Derivatives to Manage Risks
- e) The Extent of the Use of Derivatives by Non-Financial Firms
- f) General Risks Associated with the Use of Derivatives
- g) Alternatives to Hedging with Derivatives

APPENDIX 1(a)Types of Financial Price Risk1. Exchange Rate Risk

Ross, Westerfield, Jordan & Firer (1996, p617) define exchange rate risk as the risk related to having international operations in a world where relative currency values vary.

Currency exposures were briefly touched upon earlier in the definition of translation exposures.

According to Galitz (1994), they also become evident when a firm has revenues or costs denominated in foreign currency. A firm exporting to the United States for example has a short position in the rand (and a long position in the dollar) because it benefits from a depreciation of the rand relative to the dollar by becoming more competitive in the U.S market. Even companies that operate only in their domestic market have currency exposure to the extent that their competitors are based in countries with depreciating currencies.

2. Interest Rate Risk

Ross et al. (1996, p 157) defines interest rate risk as "... the risk that arises for bond holders from fluctuating interest rates."

They proceed to suggest that interest rate exposure may vary over time as a firm changes its capital structure. During times when the debt to equity ratio is higher, the firm may find its exposure to interest rate fluctuations greater. Less apparent exposures arise when a firm chooses not to invest during a depressed economy when interest rates are lower, choosing instead to embark on expansionary investment during economic boom periods when interest rates are elevated.

3. Commodity Price Risk

According to Galitz (1995, p452, "Commodity risk arises in any situation where an organisation is affected by fluctuations in the price of some commodity..."

Within his definition of commodities, Galitz includes:

- Metals, such as copper, gold and platinum;
- Agricultural products, such as wheat, lumber, soy beans, and pork bellies;
- Energy products, such as crude oil, gas, natural and refined petroleum products; and
- Property and real estate

KPMG Peat Marwick (1994) suggest that commodity exposures are greatest for those firms who are dependent on raw materials as inputs to the production process. The response of firms to

declining competitiveness resulting from commodity price increases may in turn impact their relative competitive position. Consider for example a firm choosing to transfer the burden of a commodity price increase to its clients by increasing prices. In general if the price elasticity of demand for that product is high, in economic terms this could lead to its customers switching to substitute products thus offsetting the gains in sales revenue with reductions in volume (and gross margins).

4. Equity Price Risk

Galitz (1994,p427) defines equity risk as arising from "... variation in the value of individual shares, or that of an equity portfolio."

According to Watson (1993), equity exposures are less often recognised yet vitally important. Manifestations include share repurchases in which a firm is exposed to increases

in its share price. Similarly, a company taking a stake in another company for strategic purposes may find the cost of the investment to have been excessive following a sharp decline in the new assets market price. The use of share swaps to facilitate in mergers and acquisitions may prove to be extremely costly in the case of a decline in the acquirer's share price. Finally, companies using stock options as an integral part of their remuneration and incentive plans are exposed to increases in their share price.

APPENDIX 1 (b)Theories on Incentives to Manage Financial Price Risk1. Reduction in the Cost of Finance

Froot, Scharfstein & Stein (1993, p1630) argue that if such capital market imperfections make externally obtained funds more expensive than those generated internally, they generate a rationale for risk management. Firms choosing not to manage their price exposures will experience some variability in the cash flows generated by their assets. The consequence of this variability in the firm's internal cash flow will be either variability in the amount of money raised externally, or variability in the amount of investment undertaken. Variability in the amount of borrowing may be sub-optimal to the extent that as a firm borrows more externally the cost of funding will increase.

Froot et al. (1994, p96) summarise the fundamental notion of risk management. "In general, the supply of internally generated funds does not equal the

investment demand for funds. Sometimes there is excess supply; sometimes there is a shortage. Because external financing is costly, this imbalance shifts investment away from the optimal level. Risk management can reduce this imbalance and the resulting investment distortion. It enables companies to better align their demand for funds with their internal supply of funds. That is, risk management lets companies transfer funds from situations in which they have an excess supply to situations in which they have a shortage. In essence it allows companies to borrow from themselves."

2. Reduction in the Probability of Financial Distress

Where financial distress is without cost, the benefits of risk management are negligible. The removal of this assumption creates the incentive for firms to avoid financial distress. Mayers & Smith (1982) argue that risk management reduces this probability that the firm experiences financial distress and thereby the costs of financial distress.

Nance, Smith & Smithson (1993) suggest that the expected magnitude of this cost reduction is a positive function of the probability that the firm will encounter financial distress if it does not undertake some form of risk management, and the costs the firm would incur if did experience financial distress.

They proceed to suggest that where financial distress leads to bankruptcy, liquidation or some form of reorganisation, there are legal costs. The size of the exposures faced by the firm may influence potential size of these costs, thereby providing a greater incentive to engage risk management practices to reduce the probability of financial distress. This suggests that the extent of revenues or costs exposed to financial price risk could influence the decision of the firm to manage the financial risk.

3. Reduction in Agency Costs

Myers (1977) described the "under-investment problem" arising from dissatisfaction, where, subsequent to the issue of debt, shareholders perceive that a disproportionate share of the value of a project will accrue to creditors. In response shareholders may choose to discontinue the project despite its positive net present value. Creditors, anticipating such behaviour, incorporate these expectations into the price of debt. Where effective risk management is undertaken to prevent project exposure to fluctuation in the cost of debt, the probability of shareholders terminating a positive net present value project for such reasons is reduced.

4. Reduction in Expected Tax Liabilities

Mayers & Smith (1982) and Smith & Stulz (1985) argue that management of exposures can reduce the expected tax liability for a firm facing a progressive corporate tax structure over the range of possible income outcomes. Froot et al (1993) supports this

notion. If taxes are a convex function of earnings, it will generally be optimal to for firms to manage earning through the use of risk management tools. Where there is convexity of the corporate income tax schedule, volatile earnings will lead to higher expected taxes.

Mian (1996) recognises that while progressivity in the tax schedule applies to a very narrow range of pre-tax income, other aspects of corporate tax structures can also influence the risk management decision. For example, tax shields (tax loss carry forwards and foreign tax credits) can introduce convexity in the corporate tax schedule. "If firms do not hedge their cash flows, the utilisation of these tax shields may be postponed to a later date, thereby reducing their present value. Hedging increases the present value of these tax shields by smoothing out corporate earnings."

5. Other Theories on Incentives

Organising the risk management activities of the firm does not come without significant costs. According to the economies of scale argument the size of the exposures of the firm grow to the point where the benefits of risk management become apparent and justify the costs, or in fact drive down the average costs of risk management. Dolde (1993), however, found the relationship between firm value (size) and the decision to undertake exposure management to be indeterminate.

APPENDIX 1(c)Types of derivatives

According to Smith, Smithson & Wilford (1992) the four fundamental derivative instruments used to manage financial risks are forwards, futures, swaps and options.

Financial engineering involves the use of these basic building blocks to construct innovative asset and liability structures. Smith (1993, p401) suggests, "The role of the (financial) engineer is to combine such instruments to provide a risk return configuration otherwise unavailable. Often the objective is simply to replicate an existing product or strategy at a lower transaction cost or with some gain in hedging efficiency."

Exchange Traded versus Over the Counter (OTC)Derivatives

Watson (1993) differentiates between the exchange traded and over-the-counter (OTC) derivative products.

Exchange traded derivative products tend to be traded in formal markets with standardised product features. For example options exchanges facilitate the trade of options with fixed exercise dates and strike prices.

Over-the-counter derivative products offer non-standardised features. The features are generally tailor-made to the needs of the buyer of the derivative. According to Watson, in the OTC market, the absence of a formal clearing-house to ensure the credibility of each party to such a transaction increases the counterparty risks involved with OTC derivatives. The individualised nature of OTC may make them less liquid.

Forward Contracts

According to Smith, Smithson & Wilford (1992), forward contracts oblige the owner to buy a specified asset on a specified date at a price (known as the "exercise price") specified at the origination of the contract. They propose that the default risk of the contract is two sided since the owner of the contract either receives or makes a payment depending on the price movements of the underlying asset. Further, the value of the forward contract is conveyed only at the contract's maturity, eliminating the need for any payment to be made either at the origination of the contract or during it's term.

Figure 1, below, illustrates the use of a forward contract to hedge a position in an asset. Suppose the firm's value declines as the price of the asset increases above the expected price at maturity that is a negative risk profile). The purchase of a forward contract to cover this exposure would result in a profit that offsets this loss.

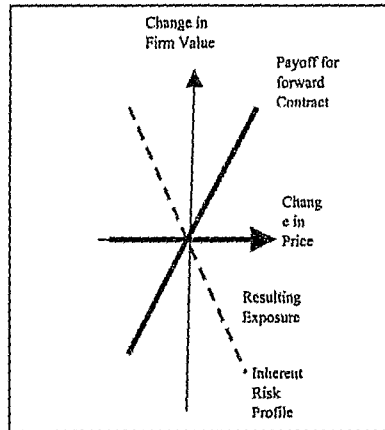


Figure 1: Payoff Profile for Forward Contract
Source: Smith, Smithson & Wilford (1992, p316)

If the risk profile were positively instead of negatively sloped, the risk would be managed by selling a forward contract.

Futures Contracts

Galitz (1994) describes futures contract as a form of a forward contract that obliges the holder to take delivery of/deliver a specified quantity of an asset at a fixed price on a fixed date in the future. The buyer of a futures contract (the holder of a long position in the futures contract) is contracted to buy the underlying asset, while the holder of a short

position in the futures contract is contracted to deliver the asset. The payoff profile for a futures contract is virtually identical to that of the forward contract. However, unlike forward contracts, default risk can be eliminated. Futures contracts are exchange traded and "marked-to-market" which essentially means that at the end of each day the counter-party is required to cash settle their losses resulting from any adverse movement in the value of the underlying asset. The requirement of an "initial margin" and management and oversight of the margin account by a clearing house acts as a performance bond which further reduces the probability of default.

Smith et al. (1993, p378) liken the futures contract to a portfolio of forward contracts. "At the close of business each day, in effect, the existing forward-like contract is settled and a new one is written."

Swap Contracts

Smith, Smithson & Sykes (1993) define a swap contract as an agreement between two counter-parties to exchange two assets or streams of payments at specified intervals. They liken a swap contract to a series of forward contracts to the extent that at each settlement date they require the parties to sell/buy a fixed price cash flow for an amount specified at the origination of the contract.

Figure 2, below, illustrates the underlying principle through an interest rate swap from the perspective of a party who is paying out a series of cash flows determined by a fixed interest rate (R_{fixed}) in return for a series of cash flows determined by a floating interest rate (R_{floating}).

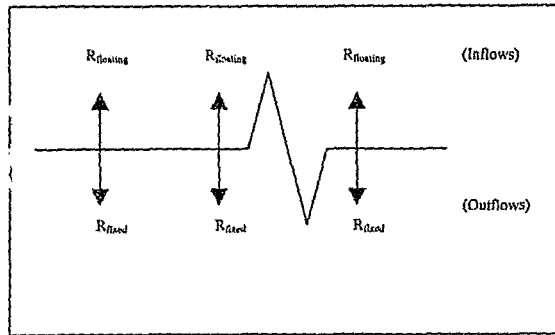


Figure 1: An Interest Rate Swap
 Source: Smith, Smithson & Wilford (1992, p317)

According to Smith et al. (1993), despite exhibiting identical payoff patterns, forwards, futures and swaps differ with respect to their default risks. A forward is a pure credit instrument since settlement is not required until the predetermined exercise date. A futures contract requires daily performance to the extent that the daily margin calls must be settled, and in doing so offers greatly reduced default risk. The default risk associated with a swap lies somewhere in between the two - the regularity of the performance periods ensure that the risk is lower than that of a forward, but greater than a futures contract.

Option Contracts

Watson (1994) defines an option contract as "... the right to buy (a call option) or sell (a put option) an asset at a pre-determined price at a specified future date. An American option allows the owner to exercise the option on or before the specified expiry date, while a European option restricts the decision to exercise to the specified expiry date."

The purchase of an option involves an up-front premium that generally equals the value of that option on the purchase date. The premium is the price the buyer pays to secure a pay-off that limits the downside of a position in the underlying asset.

Figure 3 illustrates the payoffs of put and call options. Exchange traded options are available on most major stock indices, long and short-term interest rates and exchange rates. Within the OTC market exists exotic options which may be structured to deliver

payoffs according to predetermined formulae for calculating the strikes or relevant asset price at the expiry date.

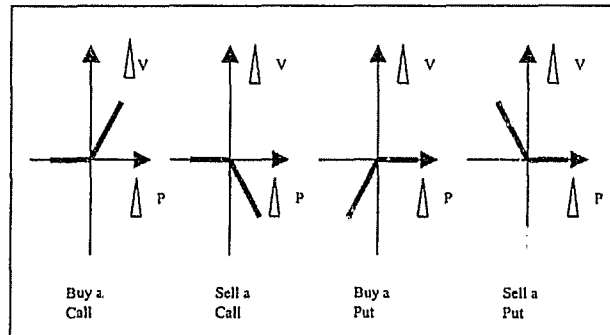


Figure 3 : Payoff Profiles of Puts and Calls
 Source: Smith, Smithson & Wilford (1992, p319)

APPENDIX 1(d)Using Derivatives to Manage Risks

The essential building blocks of derivatives, forwards, futures, swaps and options, may be used to create more complicated, customised financial instruments that in turn can be used to manage financial risks. Figure 4 attempts to illustrate how a firm, whose value is directly related to the financial price (P) of an asset (for example an interest instrument, foreign exchange or a commodity), may manage its exposure to that asset price using various combinations of derivatives.

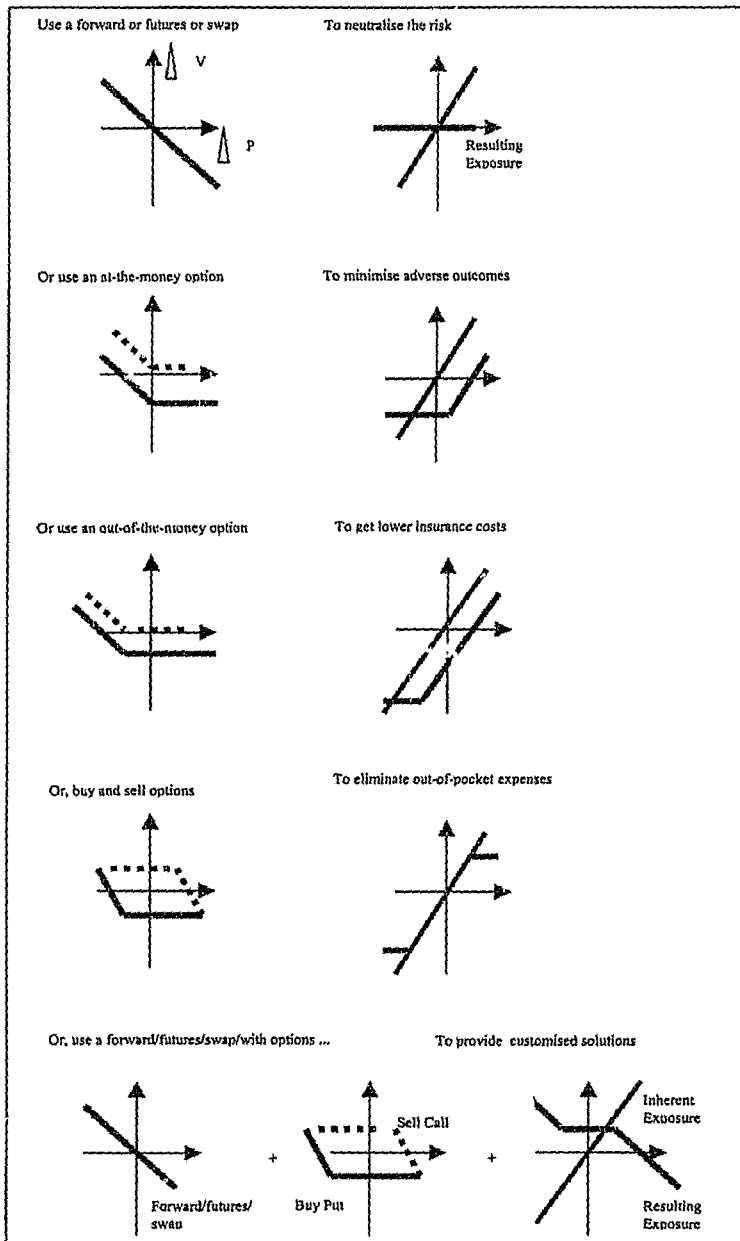


Figure 4: Combining derivatives to manage risks

Source: adapted from Smith, Smithson & Wilford (1992, p322)

APPENDIX 1(e)The Extent of the Use of Derivatives by Non-Financial Firms

Smithson (1998) cites several surveys into the extent of derivative use by non-financial firms undertaken in the United States and Europe. The results of these surveys indicate that the trend in derivative usage in non-financial U.S is decline, while Europe is experiencing growth (see Table 1)

<i>Percentage of Respondents that Use Derivatives</i>		
<i>Survey Sponsor</i>	<i>1997 User/ Respondents</i>	<i>Previous Survey* Users/ Respondents</i>
<u>North America</u>		
Greenwich Associates	US: 225/430 = 52%	US: 59%
(North American Treasury Services)	Canada: 55/132 = 42%	Canada: 57%
Treasury & Risk Management	167/271 = 62%	70%
<u>Europe</u>		
Greenwich Associates		
(European Treasury Services)	338/423 = 80%	53%
* 1996 for Greenwich Associates, 1995 for Treasury & Risk Management		

Table 1: Non-Financial Derivative Use Survey- % Use
Source: Smithson (1998, p45)

Smithson also cites surveys into the extent of exposures managed with derivatives. It was found that

exposures resulting from different financial price risks were managed to different extents (see Table 2 below).

Exposures Managed with Derivatives								
Survey Sponsor	Interest Rate		Foreign Exchange		Commodity		Equity	
	1997	1996	1997	1996	1997	1996	1997	1996
<u>North America</u>								
Greenwich Associates (North American Treasury Services) - United States	61%*	68%*	87%	74%	7%	7%	10%	11%
	39%**	50%**						
Greenwich Associates (North American Treasury Services) - Canada	61%*	68%*	91%	77%	12%	11%	17%	11%
	38%**	52%**						
<u>Europe</u>								
Record Treasury Management	91%	92%	77%	77%	17%	14%	11%	10%
* Only includes interest rate swaps with maturities between 2 - 7 years								
** Only includes interest rate options								

Table 2: Non-Financial Derivative Use Surveys- % Exposure Managed
Source: Smithson (1998, p48)

Bodnar, Marston & Hayt (1998) documented their results across three surveys conducted in 1994, 1995 and 1998. They surveyed the use of derivatives in a sample of 2000 listed non-financial companies in the United States. Table 3 and Table 4 summarise their findings with regards to the extent of the use of derivatives,

and changes in the usage of derivatives over two surveys, respectively.

Percentage of Respondents using Derivatives	
1998 Survey	50%
1995 Survey	41%
1994 Survey	35%
Firms Responding to all three surveys (58 firms)	1998 - 41% 1995 - 41% 1994 - 41%
Firms responding in both 1994 & 1998 (171 firms)	1998 - 44% 1994 - 44%

Table 3: Extent of the Use of Derivatives by Non-Financial Firms
Source: Bodnar, Marston & Hayt (1998, p2)

% of firms	
Usage has increased	42%
Usage has decreased	13%
Usage has remained constant	46%

Table 4: Year to Year Change in the Use of Derivatives by Non-Financial Firms
Source: Bodnar, Marston & Hayt (1998, p2)

In a follow up study in Germany, Bodnar & Gebhardt (1998) found 77.8% of listed non-financial firms to be users of derivatives.

APPENDIX 1(f)General Risks Associated with the Use of Derivatives1. Market Risk

They define market risk as the risk of the change in market price of an underlying instrument and the related derivative. Such price changes result from movements in the price of the underlying asset, as well as time value and volatility considerations. However, volatility levels should not adversely affect firms using derivatives for risk management (hedging) because the hedged item should theoretically experience a corresponding movement in the opposite direction. When complex derivatives with less obvious pay-off structure are used, and where the underlying asset price is highly volatile, hedging may expose the user to unpredictable results. Market risk is still identified as the most significant risk of using derivative products.

2. Credit Risk

Eldridge (1997) in defining credit risk for derivatives suggests that such risk result from the same considerations as other counter-party risk (that is, the risk that a borrower will be unable to meet obligations). The decision to use exchange traded derivatives reduces the probability of counter-party failure.

3. Legal Risk

Shapiro & Titman (1992) also recognise legal and operational risks associated with the use of derivatives. Legal risk commonly relates to legal documentation and enforceability. The nature of legal risk varies according to jurisdiction and becomes an issue where hedging with derivatives crosses borders – particularly pertinent in the case where currency exposure is the largest source of risk facing a firm.

4. Operational Risk

Operational risks associated with derivatives include inaccurate account and record keeping, fraud, incorrect market valuation, failure to record and settle a deal, and failure of computer systems.

5. Liquidity Risk

Finally, Evans (1996) highlights liquidity as the fifth risk associated with the use of derivatives. Liquidity risk is the risk that a derivative instrument cannot be purchased or liquidated quickly enough, or in requisite quantities, or at a fair price. Highly liquid markets do not generally expose the participants to the risk of widespread loss from liquidating a product. For OTC derivative products, there is generally more innovation and unique product tailoring and accordingly less liquidity.

APPENDIX 1 (g)Alternatives to Hedging with Derivatives1. Balance sheet restructuring

The firm could choose to alter the structure of its assets and liabilities. For example by reducing the debt to equity ratio the firm would alleviate the shareholder-bondholder conflict and the subsequent under-investment problem. This would reduce the need for hedging, however, appears sub-optimal in that a reduction in the debt to equity ratio may reduce the firm's tax shields and increase the firm's tax liability.

Further, duration matching of interest rate exposures may be an effective on balance sheet risk management activity.

2. Issuance of preference stock

This would reduce the probability of financial distress, and in doing so reduces the expected costs

of financial distress. Preference stock would effectively allow the firm to omit the payment of a preference dividend without the associated legal costs in the event of a bond default.

3. The issuance of convertible debt

Convertible debt helps control the conflicts of interest between shareholders and bondholders and thereby reduces the incentive to hedge. Instead of reducing the variability of the variability of the firms equity by reducing the variability of the firms cash flows as hedging does, convertibles include an embedded option on the firms assets. As such this liability becomes more sensitive to changes in the firm value and thereby reduces the sensitivity of equity value to firm value changes.

4. Dividend restrictions

Firms may choose to reduce their dividend pay out and invest more in liquid or less risky assets. In doing

this they effectively reduce their exposure to price fluctuations, as well as signal to bondholders that funds will be available to pay claims. The more times these claims are covered, the lower are the expected costs due to financial distress and agency costs.

5. Diversification

Neuberger (1996) propagates the notion of operations diversification to act as a natural internal hedge. Global diversification effectively provides natural hedges against exchange rate fluctuations, while vertical or horizontal integration offers varying degrees of natural hedges against commodity price fluctuations.

6. Risk sharing arrangements

Baldoni & Yeager (1995) discuss the use of risk sharing arrangements as alternative form of hedging to the use of derivatives. The principles of risk sharing appear to be equally applicable to the management of exposures resulting from commodity price and interest

rate risk.

They suggest that risk-sharing arrangements were created due to the undesirability or the unavailability of external hedges such as derivatives. A perceived problem of hedging externally is the decision of how far into the future to hedge cash flows. With a risk sharing arrangement, the structure is always in place protecting future cash flows (barring expiration of the agreement, or a reset or negotiation point).

APPENDIX 2:

a) Covering letter

b) Questionnaire

Date

The Chief Financial Officer
Publishing & Broadcasting Limited
Attn: Steven Wright
PO Box 27
Willoughby NSW 2068

Dear Sir/Madam

Please find attached a questionnaire relating to the use, or non-use, of derivatives by your organisation. This questionnaire forms the basis for research into the extent and nature of the use of derivatives amongst listed Australian "non-financial services" firms. The purpose of the research is to meet the performance requirements for the Masters of Business Administration program at the University of the Witwatersrand, South Africa. In doing so it is also presumed that such research will contribute to the widening of the body of academic literature on derivatives.

The questionnaire should not take more than 10 minutes to complete. Ideally, the questionnaire should be completed by an individual with a broad overview of the financial control and risk management activities of your organisation. If you are unable to accommodate this, it would be appreciated if you could delegate the completion or forward it to the appropriate individual.

Your assistance through the completion of this survey is sincerely appreciated. Raw data relating to individual questionnaires will be confidential, but overall outcomes of the research will gladly be provided should you be interested.

Yours faithfully

Devon T Pather
C/- 42 Holden Street
Ashfield, NSW
Australia 2131
Ph: 61 2 9798 4780

SURVEY - DERIVATIVES USE BY LISTED NON-FINANCIAL SERVICES FIRMS

UPON COMPLETION PLEASE RETURN IN ATTACHED PRE-PAID ENVELOPE TO -

Devon Pather
c/- 42 Holden Street
Ashfield NSW 2131

PART A - BACKGROUND INFORMATION

1. What is the market capitalisation of your firm?

(please approximate in \$m)

\$

2. How you would describe the dominant industry in which your firm is involved?

(please circle the appropriate response)

- a. Primary
- b. Manufacturing
- c. Services

3a. What percentage of the consolidated revenues of your firm are exposed to financial price risk?

(ie. currency, commodity price, interest rate or equity price risks)

(please circle the response which is closest)

- a. 10% b. 10% c. 20% d. 30% e. 40% f. 50% +

3b. What percentage of the consolidated costs of your firm are exposed to financial price risk?

(ie. currency, commodity price, interest rate or equity price risks)

(please circle the response which is closest)

- a. 0% b. 10% c. 20% d. 30% e. 40% f. 50% +

4. Please indicate your degree of concern about the following exposures encountered by business.

(please indicate your degree of concern with each issue by ticking the appropriate box)

	No Concern	Low	Moderate	High
a. Accounting Exposures (exposure resulting from costs/revenues to which your firm is contractually committed)				
b. Translation Exposures (resulting from the conversion of accounting data from one currency to another)				
c. Contingent Exposures (exposures which affect the value of future transactions)				

5. Please rank the importance of the following factors in your decision to manage your financial price risk.

(please rank 1 - most important to 5 - least important)

	Rank (1-5)
a. tax benefits arising from the management of future income streams	
b. reduction in the probability of financial distress	
c. economies of scale in the use of risk management instruments	
d. reductions in the cost of finance	
e. reductions agency costs (ie conflict between shareholders and management)	

PART B - NON-DERIVATIVE RISK MANAGEMENT APPROACHES

6. Please indicate which of the following risk management approaches you are familiar with:

(please indicate with a tick)

a. Risk sharing arrangements	
b. Balance sheet restructuring	
c. Issuance of preference stock (instead of ordinary shares)	
d. Issuance of convertible debt	
e. Dividend restrictions	
f. Geographical and/or vertical diversification	
g. Other approaches not involving the use of derivatives (please specify)	

7. What percentage of your financial risk exposures are managed by **non-derivative** risk management approaches?

(please circle the response which is closest)

a. 0% b. 10% c. 20% d. 30% e. 40% f. 50% +

PART C - USE OF DERIVATIVES

- 8a. Does your firm use derivatives (forwards, futures, swaps, options or other exotic structures)?

(please circle)

a. YES (if YES - proceed to Q9)

b. NO (if NO - proceed to Q8b)

If you answered **NO** to 8a, please complete 8b.

- 8b. Please rank the importance of the following factors in your decision **not** to use derivatives?

(please rank 1 - most important to 8 - least important)

	Rank (1-8)
a. Insufficient exposure to financial prices	
b. Exposures more effectively managed by other means	
c. Difficulty in pricing and evaluating derivatives	
d. Disclosure requirements	
e. Accounting treatment	
f. Concerns about public/shareholder/regulator perceptions of derivatives	
g. Costs of establishing and maintaining a derivatives program exceed benefits	
h. Other reasons (please specify)	

Please continue if you answered **YES** to 8a.

9a. What percentage of the derivatives used by your firm involve exchange traded instruments?
(please circle the response which is closest)

a. 0% b. 10% c. 20% d. 30% e. 40% f. 50% +

9b. What percentage of the derivatives used by your firm involve over-the-counter (OTC) instruments?
(please circle the response which is closest)

a. 0% b. 10% c. 20% d. 30% e. 40% f. 50% +

9c. Based upon the notional value of contracts, how does the usage of derivatives by your firm compare to last year?
(please circle the appropriate response)

a. Usage has increased b. Usage has decreased c. Usage has remained constant

PART D - MANAGEMENT OF DERIVATIVES RISK

10. Which statement best describes your organisations control of the use of derivatives to manage each of the following forms of risk?
(please indicate with a tick for each type of risk)

	Foreign Exchange Risk	Interest Rate Risk	Commodity Price Risk	Equity Price Risk
Exposure not managed with derivatives				
Risk management activities are primarily centralised				
Risk management activities are primarily decentralised with centralised coordination				
Risk management activities primarily decentralised				

11. Please indicate the type hedging activities using derivatives which are undertaken by your firm.
(please indicate with a tick for each type)

Straight Hedging (derivative exposure exactly offsets the financial price exposure)	
Options Hedging (using options to hedge exposures)	
Speculative Hedging (potential upside of derivative exposure more than offsets the financial price exposure)	
Other (please specify)	

12a. Please rank your degree of concern about the following **issues** with respect to derivatives.

(please rank 1 - most concern to 6 - least concern)

	Rank (1-6)
a. Market Risk (derivatives price risk)	
b. Counterparty (or credit risk)	
c. Legal/regulatory issues	
d. Operational risks (including ability to monitor and evaluate hedge results)	
e. Reaction by analysts or investors	
f. Secondary market liquidity	

12b. Please rank your degree of concern about the following **types of risk** associated with the selection of particular derivative instrument for hedging purposes.

(please rank 1 - most concern to 6 - least concern)

	Rank (1-6)
a. Correlation Risk (risk of change in relationship between the asset and derivative)	
b. Ratio Risk (arising from changes in the hedge ratio over time)	
c. Execution Risk (risk in implementation of the derivative strategy)	
d. Liquidity Risk (inability to purchase or liquidate a derivative position)	
e. Model Risk (mispricing resulting from inappropriate assumptions)	
f. Judgement Risk (failure in individual decision making)	

13a. Does your firm have a documented policy with respect to the use of derivatives?

(please circle)

- a. YES If YES please answer Q13b., then Q13c
b. NO If NO please proceed to answer Q13c.

13b. Is the policy mandated by the Board of Directors?

(please circle)

- a. YES
b. NO

13c. How frequently is derivatives activity reported to the Board of Directors?

(please circle the appropriate response)

- a. Daily b. Weekly c. Monthly
d. Quarterly e. Annually d. As needed/No schedule

14. What is the lowest rated counterparty with which your firm will enter into a derivatives transaction?

(please tick the appropriate rating for each maturity)

	AAA	AA	A	BBB	less than BBB	No set policy/ Don't know
a. Maturity 12 months or less						
b. Maturity 12 months or more						

15. Does your firm use ISDA (International Swaps and Derivatives Association) documentation in its dealings with counterparties to OTC derivative transactions?
(please circle)

- a. YES
- b. NO
- c. DO NOT KNOW/DO NOT USE OTC's

16. Does your firm calculate "value-at-risk" for some or all of its derivatives portfolio?
(please circle)

- a. YES
- b. NO

17. How frequently does your firm value you derivatives portfolio?
(please circle the appropriate response)

- a. Daily
- b. Weekly
- c. Monthly
- d. Quarterly
- e. Annually
- d. As needed/No schedule

18. Rank your reliance on each of the following for valuing your derivative portfolio.
(please rank 1 - most important to 3 - least important)

	Rank (1-3)
a. Dealer that originated the transaction	
b. Another dealer/consultant/price vendor (eg Bloomberg, Reuters)	
c. Internal source (proprietary systems, spreadsheets etc)	

PART E - IMPACT OF ACCOUNTING STANDARDS

19. What has been the impact of AASB 1033/AAS 33 rules (disclosure of the use of derivatives) on the use of derivatives by your firm?
(please tick all that apply)

a. No affect on derivatives use or risk management strategy	
b. Reduction in the use of derivatives	
c. An increase in the use of derivatives	
d. A change in the type of derivative instruments used	
e. Alteration in the timing of hedging transactions	
f. A significant change in the firms use of derivatives and/or risk management strategy	

20. Which of the following does your firm believe to be an issue relating to the public disclosure of your use of derivatives?
(please tick all that apply)

a. Places your firm at a competitive disadvantage	
b. Does not reveal any useful information in terms of your firms risk profile	
c. Is open to misinterpretation	
d. May create shareholder manager conflict	
e. None of the above/Other (please specify)	

THANK YOU FOR YOUR COOPERATION WITH THIS SURVEY - TO RECEIVE A COPY OF THE RESULTS PLEASE NOTE YOUR NAME/ADDRESS ON PAGE 1 OF THE SURVEY.

APPENDIX 3:

- a) Summary Results
- b) Chi-square Test

1. Market Capitalisation

300	1800	660	1500	130	860	120	210	1300
141	7700	1600	280	700	91	225	23000	9990
120	100	230	370	3300	420	3000	6000	591
350	150	600	270	300	455	300	100	155
110	570	3473	438					

2. Industry Type

a. Primary	24
b. Manufacturing	25
c. Services	30

3a. Percentage of revenues exposed to financial price risk

0-9%	10-19%	20-29%	30-39%	40-49%	50%+
10	12	41	31	6	30

3b. Percentage of the costs exposed to financial price risk

0-9%	10-19%	20-29%	30-39%	40-49%	50%+
8	24	16	10	4	18

4. Degree of concern about the following exposures encountered by business.

	No Concern	Low	Moderate	High
a. Accounting Exposures	8	30	16	26
b. Translation Exposures	12	28	24	16
c. Contingent Exposures	4	22	32	22

5. Ranking of importance of factors in decision to manage financial price risk

	1	2	3	4	5
a. tax benefits arising from the management of future income streams	10	8	30	18	14
b. reduction in the probability of financial distress	56	16	2	6	
c. economies of scale in the use of risk management instruments		6	28	30	16
d. reductions in the cost of finance	12	44	8	12	4
e. reductions agency costs (ie conflict between shareholders and management)		6	12	16	46

PART B - NON-DERIVATIVE RISK MANAGEMENT APPROACHES

6. Number of respondents aware of non-derivative risk management approaches

	a	b	c	d	e	f	g
a. Risk sharing arrangements	45						
b. Balance sheet restructuring		72					
c. Issuance of preference stock (instead of ordinary shares)			56				
d. Issuance of convertible debt				58			
e. Dividend restrictions					44		
f. Geographical and/or vertical diversification						66	
g. Other approaches not involving the use of derivatives (please specify)							6

7. Percentage of your financial risk exposures are managed by non-derivative risk management approaches

0-9%	10-19%	20-29%	30-39%	40-49%	50%+
8	26	16	10		20

PART C - USE OF DERIVATIVES

8a. Does your firm use derivatives (forwards, futures, swaps, options)

a. YES if YES - proceed to Q9) 72

b. NO if NO - proceed to Q8b) 8

If you answered **NO** to 8a. please complete 8b.

8b. Rank the importance of the following factors in your decision not to use derivatives

(please rank 1 - most important to 8 - least important)

	1	2	3	4	5	6	7
a. Insufficient exposure to financial prices	4	2					2
b. Exposures more effectively managed by other means		4	2	2			
c. Difficulty in pricing and evaluating derivatives				6	2		
d. Disclosure requirements					2	6	
e. Accounting treatment					2	2	4
f. Concerns about public/shareholder/regulator perceptions of derivatives		2	2	2	2		
g. Costs of establishing and maintaining a derivatives program exceed benefits	4	2					2
h. Other reasons (please specify)							

Please continue if you answered **YES** to 8a.

9a. What percentage of the derivatives used by your firm involve exchange traded instruments?

(please circle the response which is closest)

0-9%	10-19%	20-29%	30-39%	40-49%	50%+
46	4	6			16

9b. What percentage of the derivatives used by your firm involve over-the-counter (OTC) instruments?

(please circle the response which is closest)

0-9%	10-19%	20-29%	30-39%	40-49%	50%+
12			2	2	56

9c. Based upon the notional value of contracts, how does the usage of derivatives by your firm compare to last year?

(please circle the appropriate response)

a. Usage has increased	b. Usage has decreased	c. Usage has remained constant
28	6	38

PART D - MANAGEMENT OF DERIVATIVES RISK

10. Which statement best describes your organisations control of the use of derivatives to manage each of the following forms of risk?

(please indicate with a tick for each type of risk)

	Foreign Exchange Risk	Interest Rate Risk	Commodity Price Risk	Equity Price Risk
Exposure not managed with derivatives	8	4	12	44
Risk management activities are primarily centralised	56	54	45	25
Risk management activities are primarily decentralised	14	4	8	
Risk management activities primarily decentralised with centralised coordination			4	

11. Please indicate the type hedging activities using derivatives which are undertaken by your firm.
(please indicate with a tick for each type)

Straight Hedging (derivative exposure exactly offsets the financial price exposure)	62
Options Hedging (using options to hedge exposures)	52
Speculative Hedging (potential upside of derivative exposure more than offsets the financial price exposure)	4
Other (please specify)	

12a. Please rank your degree of concern about the following issues with respect to derivatives.

(please rank 1 - most concern to 6 - least concern)

	1	2	3	4	5	6
a. Market Risk (derivatives price risk)	48	14	2	2	4	2
b. Counterparty (or credit risk)	12	22	14	10	10	4
c. Legal/regulatory issues		6	18	24	14	10
d. Operational risks (including ability to monitor and evaluate hedge results)	10	14	20	16	12	
e. Reaction by analysts or investors		12	12	12	18	18
f. Secondary market liquidity	2	2	8	10	10	40

12b. Please rank your degree of concern about the following types of risk associated with the selection of particular derivative instrument for hedging purposes.

(please rank 1 - most concern to 6 - least concern)

	1	2	3	4	5	6
a. Correlation Risk (risk of change in relationship between the asset and derivative)	26	8	14	8	2	14
b. Ratio Risk (arising from changes in the hedge ratio over time)	4	14	10	12	24	8
c. Execution Risk (risk in implementation of the derivative strategy)	12	12	12	16	6	14
d. Liquidity Risk (inability to purchase or liquidate a derivative position)	14	10	12	18	14	4
e. Model Risk (mispricing resulting from inappropriate assumptions)	2	16	12	10	18	14
f. Judgement Risk (failure in individual decision making)	14	12	12	8	8	18

13a. Does your firm have a documented policy with respect to the use of derivatives?

(please circle)

- a. YES If YES please answer Q13b., then Q13c
b. NO If NO please proceed to answer Q13c.

13b. Is the policy mandated by the Board of Directors?

(please circle)

- a. YES 64
b. NO

13c. How frequently is derivatives activity reported to the Board of Directors?

(please circle the appropriate response)

- a. Daily b. Weekly c. Monthly
d. Quarterly e. Annually f. As needed/No schedule

14. What is the lowest rated counterparty with which your firm will enter into a derivatives transaction?

(please tick the appropriate rating for each maturity)

	AAA	AA	A	BBB	less than BBB	No set policy/ Don't know
a. Maturity 12 months or less	12	16	26	4		14
b. Maturity 12 months or more	12	20	24	2		14

15. Does your firm use ISDA (International Swaps and Derivatives Association) documentation in its dealings with counterparties to OTC derivative transactions?

(please circle)

- a. YES
b. NO
c. DO NOT KNOW/DO NOT USE OTC's

APPENDIX

Chi-Square Test for revenue

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	0 6.60	4 6.60	20 10.80	24
2	8 7.15	8 7.15	10 11.70	26
3	14 8.25	10 8.25	6 13.50	30
Total	22	22	36	80

$$\begin{aligned} \text{Chi-Sq} &= 6.600 + 1.024 + 7.837 + \\ &\quad 0.101 + 0.101 + 0.247 + \\ &\quad 4.008 + 0.371 + 4.167 = \underline{24.456} \\ \text{DF} &= 4, \text{ P-Value} = \underline{0.000} \end{aligned}$$

Chi-Square Test for cost

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	6 9.60	16 7.80	2 6.60	24
2	8 10.40	4 8.45	14 7.15	26
3	18 12.00	6 9.75	6 8.25	30
Total	32	26	22	80

$\text{Chi-Sq} = 1.350 + 8.621 + 3.206 +$
 $0.554 + 2.343 + 6.563 +$
 $3.000 + 1.442 + 0.614 = \underline{27.692}$
 $\text{DF} = 4, \text{P-Value} = \underline{0.000}$

Chi-Square Test for Accounting

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	10 11.40	8 4.80	6 7.80	24
2	6 12.35	6 5.20	14 8.45	26
3	22 14.25	2 6.00	6 9.75	30
Total	38	16	26	80

$\text{Chi-Sq} = 0.172 + 2.133 + 0.415 +$
 $3.265 + 0.123 + 3.645 +$
 $4.215 + 2.667 + 1.442 = \underline{18.078}$
 $\text{DF} = 4, \text{P-Value} = \underline{0.001}$
 1 cells with expected counts less than 5.0

Chi-Square Test for Translation

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	12 12.00	8 7.20	4 4.80	24
2	12 13.00	8 7.80	6 5.20	26
3	16 15.00	8 9.00	6 6.00	30
Total	40	24	16	80

$\text{Chi-Sq} = 0.000 + 0.089 + 0.133 +$
 $0.077 + 0.005 + 0.123 +$
 $0.067 + 0.111 + 0.000 = \underline{0.605}$
 $\text{DF} = 4, \text{P-Value} = \underline{0.962}$
 1 cells with expected counts less than 5.0

Chi-Square Test for Contingent

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	10 10	8 8	6 6	24

	7.80	9.60	6.60	
2	4	12	10	26
	8.45	10.40	7.15	
3	12	12	6	30
	9.75	12.00	3.25	
Total	26	32	22	80
Chi-Sq = 0.621 + 0.267 + 0.033 +				
2.343 + 0.246 + 1.136 +				
0.519 + 0.009 + 0.614 = <u>5.800</u>				
DF = 4, P-Value = <u>0.215</u>				

2. Rationale for Financial Price Risk Management Approaches

Chi-Square Test for factor A

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	4	4	16	24
	5.20	8.67	10.12	
2	4	10	12	26
	5.64	9.40	10.96	
3	10	16	7	33
	7.16	11.93	13.92	
Total	18	30	35	83
Chi-Sq = 0.279 + 2.519 + 3.416 +				
0.476 + 0.039 + 0.098 +				
1.130 + 1.390 + 3.437 = <u>12.783</u>				
DF = 4, P-Value = <u>0.012</u>				

Ordinal Logistic Regression for factor A

Link Function: Logit

Response Information

Variable	Value	Count
C2	1	10
	2	8
	3	30
	4	18
	5	14
Total		80

Logistic Regression Table

Predictor	Coef	StDev	Z	P	Odds Ratio	95% CI Lower
Upper						
Const(1)	-2.9930	0.5229	-5.72	0.000		
Const(2)	-2.2409	0.4688	-4.78	0.000		

Const(3)	-0.3619	0.3872	-0.93	0.350	
Const(4)	0.9337	0.4062	2.30	0.022	
C1					
2	0.4196	0.5140	0.82	<u>0.414</u>	<u>1.52</u> 0.56
4.17					
3	1.8355	0.5363	3.42	<u>0.001</u>	<u>6.27</u> 2.19
17.93					

Log-likelihood = -112.832

Test that all slopes are zero: G = 14.119, DF = 2, P-Value = 0.001

Goodness-of-Fit Tests

Method	Chi-Square	DF	P
Pearson	12.551	6	0.051
Deviance	14.268	6	0.027

Measures of Association:

(Between the Response Variable and Predicted Probabilities)

Pairs	Number	Percent	Summary Measures	
Concordant	1216	50.5%	Somers D	0.32
Discordant	456	18.9%	Goodman-Kruskal Gamma	0.45
Ties	736	30.6%	Kendalls Tau-a	0.24
Total	2408	100.0%		

Chi-Square Test(B)

Expected counts are printed below observed counts

	C1	C3	Total
1	18 17.50	2 2.50	20
2	20 19.25	2 2.75	22
3	18 19.25	4 2.75	22
Total	56	8	64

Chi-Sq = 0.014 + 0.100 +
0.029 + 0.205 +
0.081 + 0.568 = 0.997

DF = 2, P-Value = 0.607

3 cells with expected counts less than 5.0

Chi-Square Test (c)

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	4 1.80	12 8.40	8 13.80	24
2	2 1.95	8 9.10	16 14.95	26
3	0 2.25	8 10.50	22 17.25	30

Total	6	28	46	80
-------	---	----	----	----

$\text{Chi-Sq} = 2.689 + 1.543 + 2.438 + 0.001 + 0.133 + 0.074 + 2.250 + 0.595 + 1.308 = \underline{11.031}$

DF = 4, P-Value = 0.026

3 cells with expected counts less than 5.0

Chi-Square Test (D)

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	2 3.60	16 15.60	6 4.80	24
2	6 3.90	18 16.90	2 5.20	26
3	4 4.50	18 19.50	8 6.00	30
Total	12	52	16	80

$\text{Chi-Sq} = 0.711 + 0.010 + 0.300 + 1.131 + 0.072 + 1.960 + 0.056 + 0.115 + 0.667 = \underline{5.031}$

DF = 4, P-Value = 0.284

4 cells with expected counts less than 5.0

Chi-Square Test (E)

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	6 5.40	6 4.80	12 13.80	24
2	4 5.85	8 5.20	14 14.95	26
3	8 6.75	2 6.00	20 17.25	30
Total	18	16	46	80

$\text{Chi-Sq} = 0.067 + 0.300 + 0.235 + 0.585 + 1.508 + 0.060 + 0.231 + 2.667 + 0.438 = \underline{6.091}$

DF = 4, P-Value = 0.192

1 cells with expected counts less than 5.0

6.2

Chi-Square Test for question 14

Expected counts are printed below observed counts

C1	C2	C3	C4	C5	Total
----	----	----	----	----	-------

1	12	16	26	4	14	72
	12.00	18.00	25.00	3.00	14.00	
2	12	20	24	2	14	72
	12.00	18.00	25.00	3.00	14.00	
Total	24	36	50	6	28	144

$$\text{Chi-Sq} = 0.000 + 0.222 + 0.040 + 0.333 + 0.000 + 0.000 + 0.222 + 0.040 + 0.333 + 0.000 = 1.191$$

$$\text{DF} = 4, \text{P-Value} = 0.880$$

2 cells with expected counts less than 5.0

Measure the location of the responses

	1	2	3	4	5	mean	rank
a. tax benefits arising from the management of future income streams	10	8	30	18	14	3.23	3
b. reduction in the probability of financial distress	56	16	2	6		1.48	1
c. economies of scale in the use of risk management instruments		6	28	30	16	3.70	4
d. reductions in the cost of finance	12	44	8	12	4	2.40	2
e. reductions agency costs (ie conflict between shareholders and management)		6	12	16	46	4.28	5

primary	1	2	3	4	5	mean	rank
a. tax benefits arising from the management of future income streams	2	2	4	10	6	3.67	4
b. reduction in the probability of financial distress	18	4		2		1.42	1
c. economies of scale in the use of risk management instruments		4	12	2	6	3.42	3
d. reductions in the cost of finance	2	10	6	6		2.67	2
e. reductions agency costs (ie conflict between shareholders and management)		4	2	6	12	4.08	6

manufacturing	1	2	3	4	5	mean	rank
a. tax benefits arising from the management of future income streams		4	10	6	6	3.54	3
b. reduction in the probability of financial distress	20	4	2			1.31	1
c. economies of scale in the use of risk management instruments		2	8	10	6	3.77	4
d. reductions in the cost of finance	6	16	2	2		2.00	2
e. reductions agency costs (ie conflict between shareholders and management)			4	8	14	4.38	5

Services	1	2	3	4	5	mean	rank
a. tax benefits arising from the	8	2	16	2	2	2.60	3

management of future income streams							
b. reduction in the probability of financial distress	18	8		4		1.67	1
c. economies of scale in the use of risk management instruments			8	18	4	3.87	4
d. reductions in the cost of finance	4	18		4	4	2.53	2
e. reductions agency costs (ie conflict between shareholders and management)		2	6	2	20	4.33	5

Issues	1	2	3	4	5	6	mean	rank
Market Risk	48	14	2	2	4	2	1.69	1
Counterparty	12	22	14	10	10	4	2.94	2
Legal/regulatory issues		6	18	24	14	10	4.06	4
Operational risks	10	14	20	16	12		3.08	3
Reaction by analysts or investors		12	12	12	18	18	4.25	5
Secondary market liquidity	2	2	8	10	10	40	5.00	6

Types of risk	1	2	3	4	5	6	mean	rank
Correlation Risk	26	8	14	8	2	14	2.92	1
Ratio Risk	4	14	10	12	24	8	3.86	5
Execution Risk	12	12	12	16	6	14	3.47	3
Liquidity Risk	14	10	12	18	14	4	3.28	2
Model Risk	2	16	12	10	18	14	3.94	6
Judgement Risk	14	12	12	8	8	18	3.53	4

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