Derivatives use and risk management practices by UK nonfinancial companies

Ahmed A. El-Masry
Plymouth Business School, Plymouth, UK

Abstract

Purpose – In the last two decades, a number of studies have examined the risk management practices within nonfinancial companies. For instance, some studies report on the use of derivatives by nonfinancial firms. Yet, another group of researchers has investigated the determinants of corporate hedging policies. These and other studies of similar focus have made important contributions to the literature. This study sheds light on derivatives use and risk management practices in the UK market.

Design/methodology/approach – This paper presents the results of a questionnaire survey, which focused on determining the reasons for using or not using derivatives for 401 UK nonfinancial companies. Furthermore, it investigates the extent to which derivatives are used, and how they are used.

Findings – The results indicate that larger firms are more likely to use derivatives than medium and smaller firms, public companies are more likely to use derivatives than private firms, and derivatives usage is greatest among international firms. The results also show that, of firms not using derivatives, half of firms do not use these derivative instruments because their exposures are not significant and that the most important reasons they do not use derivatives are: concerns about disclosures of derivatives activity required under FASB rules, and costs of establishing and maintaining derivatives programmes exceed the expected benefits. The results show that foreign exchange risk is the risk most commonly managed with derivatives and interest rate risk is the next most commonly managed risk. The results also indicate that the most important reason for using hedging with derivatives is managing the volatility in cash flows.

Research limitations/implications – As with other survey research, a major limitation is that responses might represent personal opinions. We cannot verify that the opinions coincide with actions. We suggest that further research could improve the understanding of firms' derivatives use by including more detailed data, different time spans, and larger samples.

Originality/value – To highlight the extent of derivatives usage and risk management practices in UK nonfinancial companies.

Keywords Derivative markets, United Kingdom, Foreign exchange, Risk management

Paper type Research paper

Introduction

In the last twenty years, a number of studies have examined the risk management practices within nonfinancial companies. For instance, some s tudies report on the use of derivatives by nonfinancial firms (see for example: Belk and Glaum (1990); Bodnar *et al.* (1995); Bodnar *et al.* (1996); Belk and Edelshain (1997); Berkman *et al.* (1997); Grant and Marshall (1997); Fatemi and Glaum (2000); Jalilvand *et al.* (2000)). Yet, another group of researchers has investigated the determinants of corporate hedging policies (e.g. for example: Géczy *et al.* (1997); Jalilvand (1999); Adedeji and Baker (2002); Berkman *et al.* (2002); Shu and Chen (2002)). Corporate risk management is thought to be an important element of a firms overall business strategy. Stulz (1996: pp. 23-24) draws upon extant theories of corporate risk management to argue "the primary goal of risk management is to eliminate the probability of costly lower-tail outcomes – those that would cause financial distress or make a company unable to carry out its investment strategy".

Managerial Finance
Vol. 32 No. 2, 2006
pp. 137-159

0307-4358
DOI 10.1108/0307435061064191

Financial derivatives – foreign exchange, interest rate, and commodity derivatives – are important means of managing the risks facing corporations. Finance theory indicates that hedging increases firm value if there are capital market imperfections such as expected costs of financial distress, expected taxes and other agency costs. Theoretical models of corporate risk management indicate that derivatives use increases with leverage, size, the existence of tax losses, the proportion of shares held by directors, and the payout ratio. The corporate use of derivatives decreases with interest coverage and liquidity (Smith and Stulz, 1985; Froot *et al.*, 1993; Nance *et al.*, 1993).

However, previous studies find only weak evidence consistent with theory. Mian (1996) finds that there is an empirical evidence on the determinants of corporate hedging decisions. He ensures that although the evidence is inconsistent with financial distress cost models, it is mixed with respect to contracting cost, capital market imperfections, and tax-based models. Géczy *et al.* (1997) show that firms with greater growth opportunities and tighter financial constraints are more likely to use currency derivatives. Also, they find that firms with extensive foreign exchange rate exposure and economies of scale in hedging activities are more likely to use currency derivatives. Howton and Perfect (1998) find that swaps are the most often used interest-rate contract, and forwards and futures the most often-used currency contract. Gay and Nam (1998) find that firms with enhanced investment opportunity sets use derivatives more when they also have relatively lower levels of cash. Their results show that firms can and do use derivatives as one strategy to maximise shareholder value.

Nguyen and Faff (2002) argue that leverage, size and liquidity are important factors associated with the decision to use derivatives. Tufano (1996) finds that cash flow hedging strategies allow firms to avoid the dead weight of external financing by setting their internal cash flows equal to their investment needs. Guay (1999) concludes that firms using derivatives to hedge, and not to increase entity risk. Firm risk declines following derivatives use. Haushalter (2000) shows that companies with greater financial leverage manage price risks more extensively. His results also show that larger companies and companies, whose production is located primarily in regions where prices have a high correlation with the prices on which exchange-traded derivatives are based, are more likely to manage risks. Berkman *et al.* (2002) show that size and leverage are the main explanatory variables for derivatives use in both industrial and mining companies in Australia.

Although many firms and individuals use derivatives as part of an overall strategy to manage the various financial risks they face (e.g. interest rate risk, foreign currency risk, commodity price risk and equity price risk), misuse of these derivative instruments results in huge losses of several companies. Karpinsky (1998) and Singh (1999) discuss the various financial disasters relating to the use of derivative instruments. Karpinsky (1998) gives examples of some derivatives losers. For instance, Sumitomo Corporation lost $3,500 million in 1996 because of Copper Futures; Metallgeselschaft lost $1,800 million from oil Futures in 1993; Kashima Oil lost $1,500 million from FX Derivatives in 1994; Orange County lost $1,700 million from Interest Rate Derivatives in 1994; Barings Bank lost $1,400 million from Stock index and Bond futures and Options in 1995; and Daiwa Bank lost $1,100 million from Bonds in 1996.

In the cases cited above where companies have made huge losses through the trading of derivatives, the problems are not so much with the derivatives themselves but rather than with the way that are used or misused. Some of these disasters have involved unauthorised trading (e.g. the Barings bank), raising the possibility that a

significant number of companies may not have in place with appropriate controls or monitoring procedures to regulate their derivative positions (Watson and Head, 1998). Thus, it is very important for companies that they cannot ignore the need for well-defined risk management policies. It is also sensible for companies to outlaw the use of derivatives for speculative purposes.

The study surveys a sample of nonfinancial UK firms listed on the London stock exchange (LSE). An extensive questionnaire was mailed to a random sample of the nonfinancial UK companies. Responses received from 173 of these firms form the basis of the study. This study attempts to answer the following questions:

- To what extent are derivatives used?
- To what extent do firms' characteristics (e.g. size, activity, ownership status and organisational form) affect the derivatives hedging?
- Is derivatives use for purposes of managing risk, obtaining funding, or investing?
- What are the most common kinds of derivatives instruments used?
- What are the most common types of risks hedged?

The remainder of this paper is organised as follows. A review of previous surveys is presented in the second section. The third section concentrates on research methodology including data collection sources and sample. The study results are involved in the fourth section. The last section includes conclusions.

A review of previous surveys

Phillips (1995) surveys 415US firms to know the extent to which organisations use derivatives for managing risk, obtaining funding, or investing. He finds that 63.2 per cent of the respondents use derivative contracts, derivative securities or both; 78 per cent of the users report that their firms use derivatives for financial risk management; 66.7 per cent of the users report that their firms use derivatives in conjunction with obtaining funding; and 21.4 per cent of the users report that their firms use derivatives for investment purposes. In addition, he finds that 90.4 per cent of the users are exposed to interest rate risk, 75.4 per cent face FX risk, 36.6 per cent are exposed to commodity price risk, and 3.1 per cent face no risk exposure. However, there are 30.8 per cent of the users exposed to all three types of risk. Berkman *et al.* (1997) compare the use of derivatives between nonfinancial firms in New Zealand and the United States. They find that, across all firm sizes, relatively more NZ firms use derivatives. This greater use of derivatives, despite higher transaction costs, reflects the relatively high-risk exposure of NZ firms. They also find that NZ firms report more frequently on their derivative positions to their boards of directors than do US firms.

Khim and Liang (1997) claim that the usage and effect of financial derivative instruments on company risk management are different for Singaporean firms in different industries, with different turnover, ownership, international business involvement and listing status. They also find that the volatility and uncertainty in the worlds financial markets have affected companies in Singapore differently. Grant and Marshall (1997) survey the largest UK companies (FTSE 250) between 1994 and 1995. The results show that derivatives are rarely used to speculate on market movements. Indeed, the study indicates that derivatives are most commonly used to reduce the volatility of firm's cash flows. The results also indicate that swaps, forwards and options are commonly used to manage foreign exchange and interest rate risks.

The study also argues that firms seem to be very aware of the need to quantify and price their derivative positions and in a number of cases; they are using sophisticated valuation procedures. Grant and Marshall do recognise that they have a smaller sample than the US studies and that the US studies contain smaller firms that are not likely to use derivatives. However, they did not examine whether the larger or the smaller of their sample firms responded. Joseph and Hewins (1997) examine the motives behind corporate hedging in their questionnaire survey on UK multinational corporations. Joseph and Hewins claim that the primary object for corporate hedging is cash flows. The hedging motives appear to be influenced by the management's perceptions of stakeholders' attitudes to risk and financial market behaviour. They also find a relatively weak emphasis on the financial distress motive.

Bodnar *et al.* (1998) survey 530 US nonfinancial firms about the use of financial derivatives. They find that large firms tend to use OTC products, while small firms tend to use a mixture of OTC and exchange-traded products. They also find that 80 per cent of firms use derivatives to hedge firm commitments, and 44 per cent of firms use derivatives to hedge the balance sheet. Their results indicate that 67 per cent of firms expressed high concern of accounting treatment of derivatives. The most important goal of hedge with derivatives is to minimise fluctuations in cash flows. They find that 76 per cent of users have a documented policy with respect to the use of derivatives. Alkebäck and Hagelin (1999) provide survey evidence on the use of derivatives among Swedish nonfinancial firms in October 1996. By comparing firms in Sweden with firms in New Zealand and the USA, the results show that 52 per cent of the nonfinancial firms in Sweden use derivatives compared with 53 per cent in New Zealand (Berkman *et al.*, 1997) and 39 per cent in the USA (Bodnar *et al.*, 1996). The study also indicates that usage of derivatives is more common among larger than smaller firms and that the principal use of derivatives is for hedging purposes.

Bodnar and Gebhardt (1999) survey German nonfinancial firms and find that the incidence of derivatives usage is higher in Germany, but that the pattern of hedging across industry and size groupings are similar to US firms. However, they find that there are other distinctive differences between the two countries, including the primary goal of hedging, firms' choices of instruments and the influence of their market view when taking derivative positions. Prevost *et al.* (2000) survey both listed and non-listed firms across the New Zealand market in February 1998. The paper significantly expands and updates previous New Zealand-based derivatives usage surveys and finds that the risk management practices and objectives of firms in the small, open market of New Zealand are broadly similar to those of firms in larger, more developed US and German markets in many respects. Ceuster *et al.* (2000) survey the derivatives usage by nonfinancial large firms operating in Belgium. They find that a significant part of large firms have engaged themselves in risk management practices and many of the respondents claim to be strategic hedgers but fail to organise the risk management control and reporting procedures in a way that one would expect from a strategic hedger.

Joseph (2000) examines the relationship between the use of hedging techniques and the characteristics of UK multinational enterprises (MNEs). He finds that all the firms in the sample hedge foreign exchange (FX) exposure. The results indicate that UK firms focus on a very narrow set of hedging techniques and they make much greater use of derivatives than internal hedging techniques. The degree of utilisation of both internal and external techniques depends on the type of exposure that is hedged. Furthermore, the characteristics of the firms appear to explain the choice of hedging

technique but the use of certain hedging techniques appears to be associated with increases in the variability of some accounting measures. Marshall (2000) surveys the foreign exchange risk practices of large UK, US, and Asia Pacific multinational companies (MNCs). The data was collected by the questionnaire sent only to the largest MNCs in each region. He finds statistically significant regional differences in the importance and objectives of foreign exchange risk management, the emphasis on translation and economic exposures, the internal/external techniques used in managing foreign exchange risk and the policies in dealing with economic exposures. He also finds that the percentage of overseas business had no statistically significant effect on any of the responses.

Dhanani (2003) conducts a detailed, single case study of the exchange risk management process at one of the largest British multinational companies operating in the mining industry (referred as ABC). His results conclude that, instances in which corporate practices deviate from normative prescriptions do not necessarily imply sub-optimal behaviour, although some companies may benefit from the re-consideration of their exchange risk management policies.

Data and methodology

The study is conducted by mailing questionnaires to 401 UK companies, randomly picked from the Fame database, especially nonfinancial firms between March and May 2001. The questionnaire is based on some of the prior studies/surveys on similar topics (Phillips, 1995; Berkman *et al.*, 1997; Wharton surveys, 1995, 1996, 1998). The questionnaire consists of many questions that concern the respondents profile. In this study, corporate treasurers are asked a number of questions (mostly using five-point Likert-type scale) relating to derivatives activities. These include such items as firm size, industry sector, ownership structure, organisational form, why and how often firms use derivatives, currency derivatives, interest rate derivatives, options contracts, control and reporting policies. The questionnaire does not require the firms to identify themselves. Financial institutions like brokerage houses, banks, finance companies and insurance companies are excluded as the nature of activities are quite different from the other nonfinancial companies. The reason for choosing only nonfinancial firms is that our focus in this study is on end-users, as financial firms both use and sell derivative products. The use of random sampling is best fitted and consistent with the objective of the study because it can generalise the results to the whole population. This survey method is considered most appropriate as it allows collection of data from a large number of firms. A self-addressed envelope with pre-paid postage and a letter of introduction for each company are also enclosed.

Altogether, there are 154 replies from mailing and fifteen more are received after the first reminder (six weeks) and after the second reminder (eight weeks), four more are received, resulting in a total of 173 (response rate is 43.14 per cent). This rate is considered reasonable compared to prior studies (e.g. Bodnar *et al.* (1995) reported 26.5 per cent, Bodnar *et al.* (1996) reported 17.5 per cent and Kim and Liang (1997) reported 20.76 per cent), which mention the typical range of 20-40 per cent for mail survey. Out of the correct responses, 116 responses use derivatives (67 per cent), and 57 responses do not use derivatives (33 per cent). The response rate is shown in Table I.

The sample is divided into groups of different sizes as it is expected that size effects will be consistent with the existence of significant fixed costs resulting in starting and managing a derivatives programme and the tendency of larger firms to use more sophisticated financial risk management practices. Therefore, a turnover of less than

£50 million is considered small, more than £50 million but less than £250 million is considered medium, and more than £250 million is considered large. In addition, the sample is also divided into different industry sectors since the typical levels of risk exposure are expected to vary across industry sectors.

Results

In this study, corporate treasurers are asked a number of questions relating to, in particular, the following areas:

- derivatives use,
- currency derivatives,
- interest rate derivatives,
- options contracts,
- control and reporting policy.

Derivatives use

Firms are asked to indicate whether they use derivatives as well as providing data about some aspects such as size (by turnover), industry sector, ownership status, and organisational form. Of the 173 respondents who returned the questionnaires, 116 (or 67 per cent) report they are using derivatives. Figure 1 reveals this result.

This use rate is considered high when comparing to the results of some prior studies. For example, in Bodnar *et al.*'s study (1995), 53 per cent are using derivatives, while in Bodnar *et al.*'s study (1996), 41 per cent use derivatives. However, Figure 2

	Frequency	%
Panel A: response rate		
Responding firms	173	43.14
Non-responding firms	228	56.86
Total	401	100
Panel B: analysis of responding firms		
Respondents that do use derivatives	116	67
Respondents that do not use derivatives	57	33
Total	173	100

Table I.
Response rates for the questionnaire survey

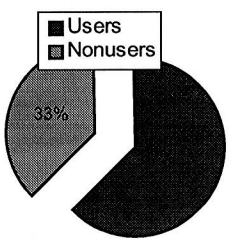

Figure 1.
Derivatives usage rate in the current study

displays the derivatives usage rate in the current study compared to some previous studies.

Derivatives usage by size

Figure 3 presents the percentage of current derivatives users broken down by size dimension. In the size dimension, usage is heaviest among large firms at 56.25 per cent. The derivative usage rate drops to 33 per cent for medium-sized firms and to 10.0 per cent for small firms. Large-sized firms are so much more likely to use derivatives because of the economies-to-scale argument for derivative use. Large firms are better able to bear the fixed cost of derivatives use compared to small firms. This positive relationship is consistent with the results of Bodnar *et al.* (1995, 1996, 1998) for US companies, Berkman *et al.* (1997) for New Zealand companies, Alkeback and Hagelin (1999) for Swedish companies, Ceuster *et al.* (2000) for Belgium companies, and Jalilvand *et al.* (2000) for Canadian companies.

Derivatives usage by industry sector

Figure 4 displays the percentage of derivatives users broken down by activity dimension. In the sector dimension, derivatives usage is greatest among communications (80 per cent), automobiles (80 per cent), electrical firms (75 per cent) and transport (70 per cent) and chemical (65 per cent). The derivatives use drops among utilities to 50 per cent, and retailers to 30 per cent. Among other firms, 60 per cent use derivatives.

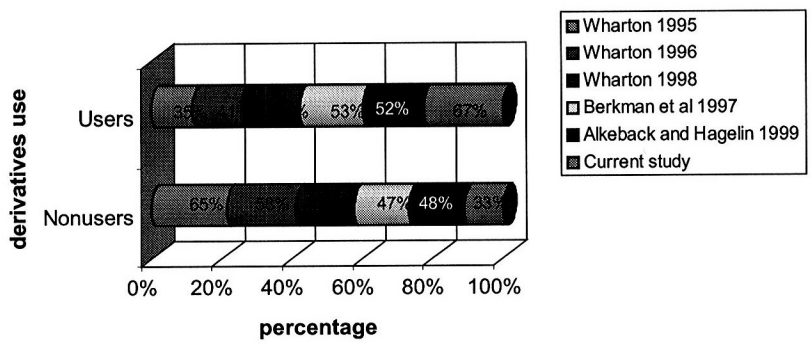

Figure 2.
Derivatives usage rate compared to some previous studies

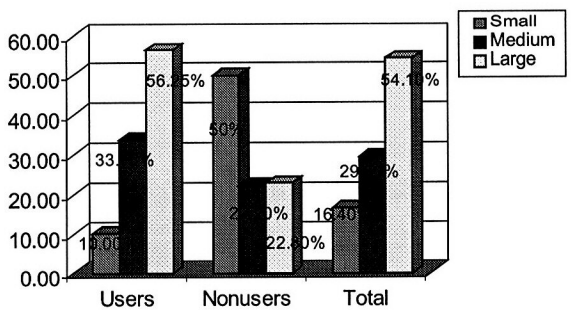

Figure 3.
Derivatives use by size dimension

Derivatives usage by ownership status

Figure 5 shows the percentage of derivatives use broken down by ownership status. In the ownership dimension, derivatives usage is greatest among public companies at 56.25 per cent and the derivatives use rate drops to 6.25 per cent for private firms. However, it is noticed that the derivatives usage rate is 37.5 per cent for the other companies.

Derivatives usage by organisational form

Figure 6 displays the percentage of derivatives use broken down by organisational form. It is shown that the use of derivatives is greatest among multi-site firms and international firms at 33 per cent and 40 per cent, respectively. The derivatives use rate drops for divisionalised firms and centralised firms to 11.5 per cent and 12.5 per cent, respectively. It is noticed that 3 per cent of the single-site firms do use derivatives and this is because these firms are often small-sized firms.

Non-use of derivatives

Firms that do not use derivatives are asked to identify the degree of importance of some factors concerning why they decide not to use them. The responses to this question are shown in Figure 7. The figure demonstrates that 50 per cent of firms do not use derivatives because their exposures are not significant. Also, the figure indicates that the most important reasons they do not use derivatives are: concerns about disclosures of derivatives activity required under FASB rules; concerns about the perceptions of derivatives use by investors, regulators, analysts or the public; and costs of establishing and maintaining derivatives programmes exceed the expected benefits. This is followed by: exposures are more effectively managed by other means such as risk diversification or risk shifting arrangements, lack of knowledge about derivatives and then difficulty pricing and valuing derivatives.

Derivatives use compared to the last year

Firms are also asked to determine whether there is any change in the intensity of usage among the firms that use derivatives. So, the firms using derivatives are asked to indicate how their derivative usage in the current year compared to usage in the previous year (based upon the notional value of total contracts). Figure 8 displays the response to this question. Of derivative users, 37.5 per cent indicate that their usage had increased over the previous year, compared to just 12.5 per cent who indicated a decrease. The remaining firms (50 per cent) indicate that their usage remained

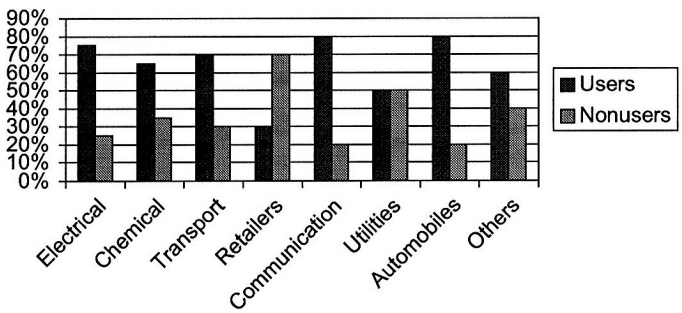

Figure 4.
Derivatives use by sector dimension

constant. Overall, this result suggests that a significant proportion of derivatives users find that derivatives use is so helpful that they are choosing to increase their usage.

VaR approach

Wilmott (1998: p. 547) defines value at risk (VaR) as "an estimate, with a given degree of confidence, of how much one can lose from ones portfolio over a given time horizon". It measures the amount of money at risk with a certain probability (Voit, 2001). It is

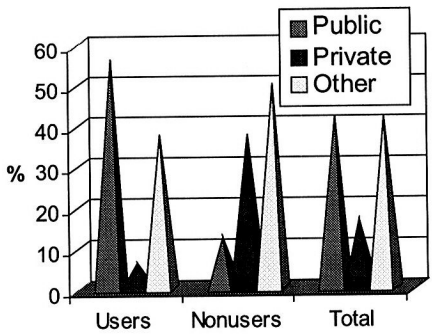

Figure 5.
Derivatives use by ownership status

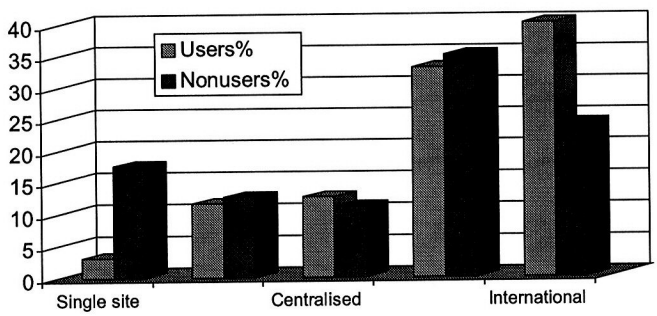

Figure 6.
Derivatives use by organisational form

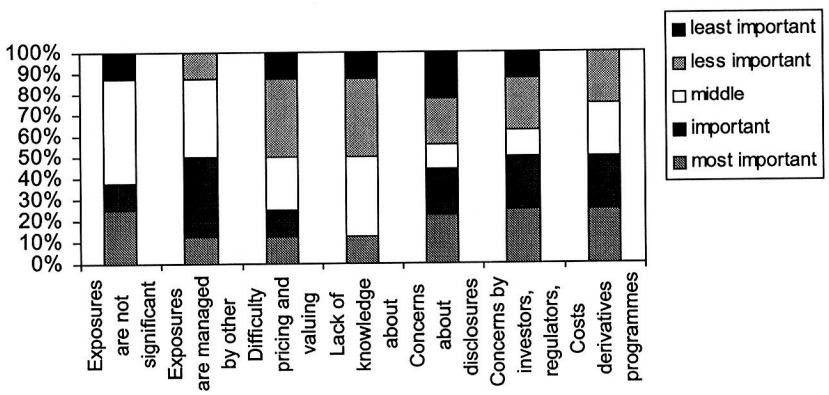

Figure 7.
Factors not to use derivatives

considered as a technique for controlling trading risks at financial institutions and nonfinancial corporations (Clark, 2002). Firms are asked to indicate whether they calculate a value-at-risk measure for some or all of derivatives portfolio. Of the derivatives users, 62.5 per cent indicate that they calculate a value-at-risk measure for some or all of their derivatives portfolio. Figure 9 displays this result.

Approach to risk management by derivatives

Financial price risk can be classified into four main types: foreign currency risk, interest rate risk, commodity price risk, and equity price risk. I am interested in the percentage of firms that use derivatives to manage risk in each of these four types. Because of the different nature of these risk types and the fact that they are often managed separately within firms, the firms are asked to indicate their approach in terms of decision-making structure to managing each type of risk. Figure 10 displays the results regarding approach of firms to manage risk by derivatives.

It is noticed that centralised risk management activities are overwhelmingly most common. The figure shows that of the firms using derivatives, foreign exchange (FX) risk is the risk most commonly managed with derivatives, being done by about

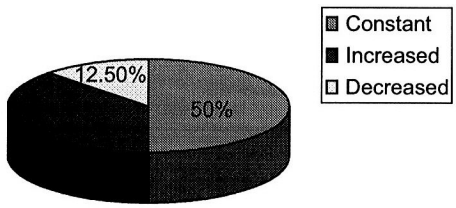

Figure 8.
Derivatives use compared to the last year

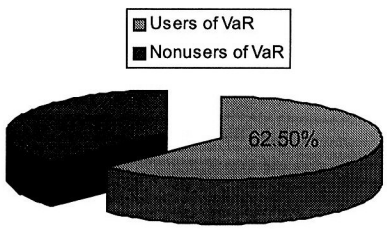

Figure 9.
How VaR calculates for derivatives portfolio

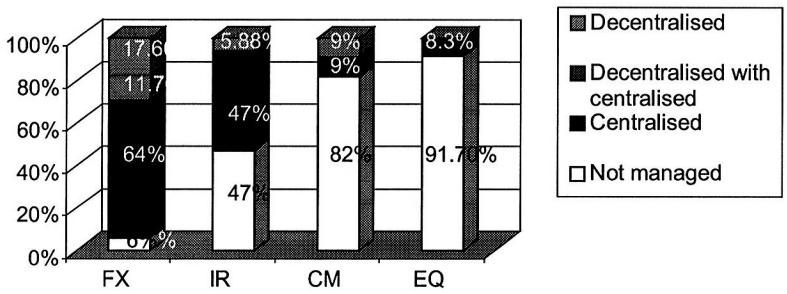

Figure 10.
Approaches to managing risks by derivatives

64 per cent of all derivatives users. Interest rate (IR) risk is the next most commonly managed risk with about 47 per cent of firms indicating IR derivatives use. Commodity (CM) risk is managed with derivatives by about 9 per cent of derivatives users, while equity (EQ) risk is the least commonly managed risk at just 8.3 per cent. It should be noted that unlike FX risk and IR risk, which are likely to be faced by all firms, some firms will not directly face EQ and CM risk because of the nature of their activities. As a result, the usage of derivatives in these classes, conditional on having an exposure, will be even higher than the responses displayed in the figure.

Concerns about derivatives usage

The use of derivatives in today's market involves many aspects. Therefore, firms are asked to indicate their degree of concern about a series of aspects regarding the use of derivatives. These aspects include: credit risk, difficulty of monitoring hedge positions, tax or legal issues, disclosure requirements, transaction costs, liquidity risk (ability to unwind transactions), lack of knowledge about derivatives, difficulty quantifying the firm's exposure, pricing and valuing of derivatives, perceptions of investors, regulators and analysts about derivatives, and evaluating the risk of derivatives transactions. For each aspect, firms are asked to indicate a high, moderate, or low level of concern or indicate that the issue is not a concern to them. Figure 11 displays the responses. There is a propensity of a majority of firms to indicate a low level and moderate level of concern (at 38 per cent and 29 per cent, respectively) with many aspects regarding the use of derivatives.

The results show that lack of knowledge about derivatives is the aspect causing the most concern among derivatives users at 31.25 per cent of the firms indicating a high concern, 12.5 per cent moderate concern, 50 per cent low concern and 6.25 per cent no concern with this aspect. Pricing and valuing derivatives positions is the next issue most concerning firms, with 25 per cent of the firms indicating a high degree of concern, 43.75 per cent of the firms indicating moderate concern, and 31.25 per cent indicating little or no concern. This is followed closely by liquidity risk with 25 per cent of the firms indicating high concern, 37.5 per cent moderate concern, 25 per cent low concern, and 12.5 per cent of the firms indicating no concern with this aspect. This is followed closely by perceptions by investors, regulators, analysts, and the public about derivatives use with 25 per cent of the firms indicating a high degree of concern, 31.25 per cent of the firms indicating moderate concern, 31.25 per cent indicating low concern and 12.5 per cent indicating no concern.

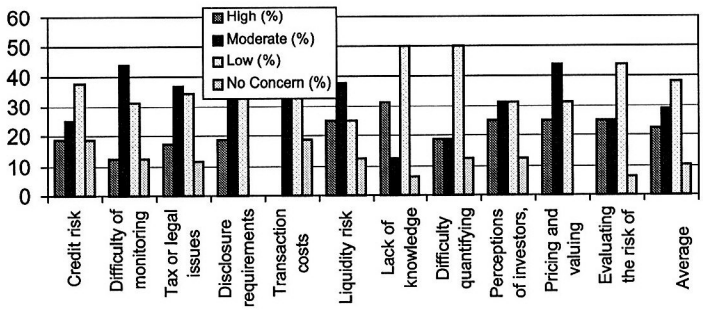

Figure 11.
Levels of concern about the use of derivatives

Reasons of hedging with derivatives

It is interesting in knowing, if a firm uses derivatives for hedging, the most important reasons of using derivatives for hedging purposes. Four reasons for hedging are identified and firms are asked to indicate the degree of the importance of these aspects. Figure 12 shows that the most important reason for using hedging with derivatives is to manage the volatility in cash flows at 37 per cent of the responding firms. The market value of the firm is considered the second most important reason of using derivatives for hedging purposes with 29 per cent of the responding firms. This is followed by managing the volatility in accounting earnings (at 25 per cent) and managing balance sheet accounts or ratios (at 19 per cent).

Kinds of derivatives used to manage financial risks

Firms are asked to indicate the kinds of derivatives they use to manage their exposures in four classes: FX risk, IR risk, CM risk, and EQ risk. Figure 13 summarises the answers. It is found that the most common kind of derivatives is forwards at 29 per cent. This is followed with swaps, OTC options, futures, exchange-traded options, structured derivatives, and hybrid debt at 23 per cent, 17 per cent, 13 per cent, 8 per cent, 6 per cent, and 2 per cent, respectively. The figure shows that forwards dominate the FX exposure (at 76.48 per cent), futures dominate the FX risk and CM risk with 21.4 per cent for each, and Swaps dominate IR and FX exposures at 37.5 per cent and 31.25 per cent, respectively. Further, OTC options and exchange-traded options dominate the FX exposure at 33.34 per cent and 25 per cent, respectively.

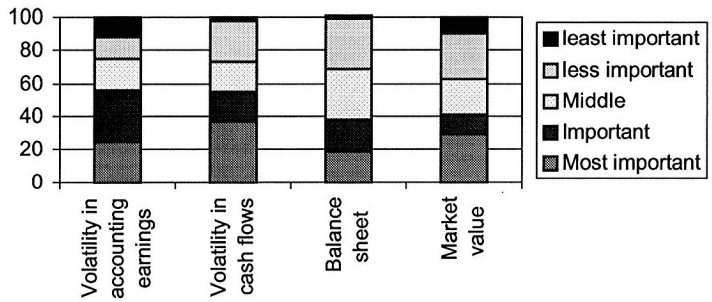

Figure 12.
Degree of importance of some aspects regarding hedging with derivatives

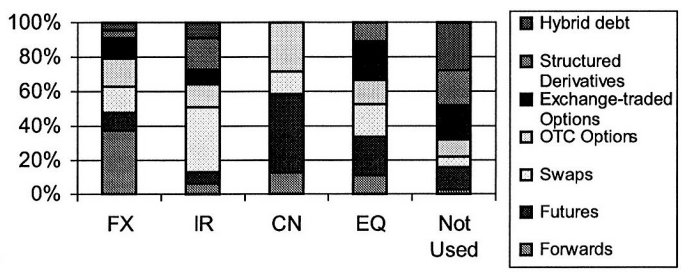

Figure 13.
Kinds of derivatives used to manage financial price risks

Derivative instruments used to manage exposures of risks
Firms are asked to indicate which instruments (e.g. forwards/futures, options, and swaps) are used to manage the following exposures: contractual commitments/ repatriations, anticipated transactions in one year or less, anticipated transactions over one year, economic/competitive exposure, and translation of accounts. Figure 14 summarises the responses. The figure shows that the most common instrument to hedge the exposure for contractual commitments or repatriations is options at 29.4 per cent of the firms using derivatives. This is followed with forwards/futures and swaps at 23.7 per cent and 23.1 per cent, respectively. It is also noticed that the most common exposure, which hedged by derivatives, is anticipated transactions in one year or less at 36.8 per cent. This is followed by contractual commitments, anticipated transactions in over a year, translation of accounts, and then economic/competitive exposure at 25 per cent, 16.2 per cent, 16.2 per cent, and 5.9 per cent.

Currency derivatives

This section focuses on the following aspects regarding currency derivatives.

Benchmark for evaluating foreign currency risk
For foreign currency risk management, firms are asked about the benchmark they use for evaluating foreign-currency risk management over the budget/planning period. Figure 15 displays the responses. The most common benchmark is the use of spot rates at the beginning of the budget/planning period at 35.4 per cent of the surveyed firms.

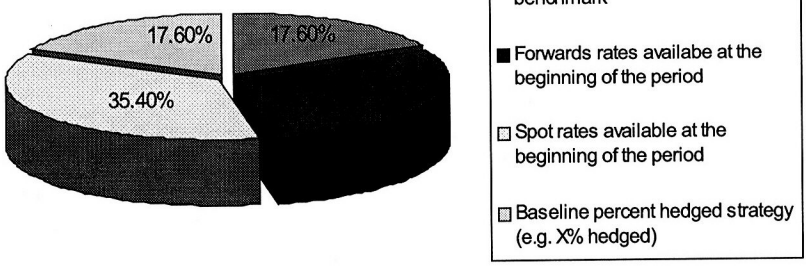

Figure 14.
Derivative instruments used to manage exposures of risks

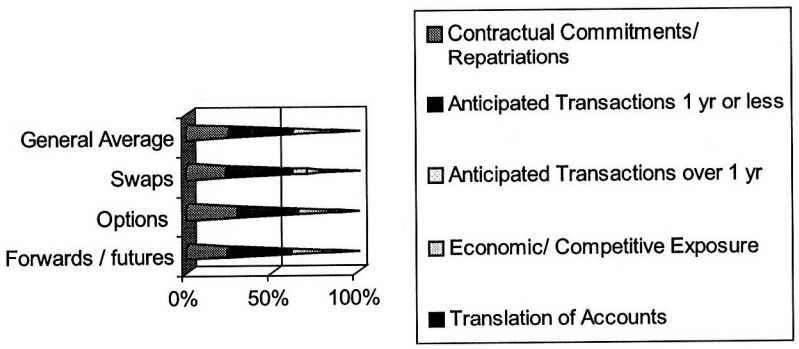

Figure 15.
Benchmarking used for evaluating FX risk management

This approach is questionable on theoretical grounds as the current spot rates do not incorporate any market expectations of currency movements over the period nor do they offer rates at which any risks could actually be laid off. This is followed closely with forwards rates available at the beginning of the period at 29.4 per cent. Of the responding firms, 17.6 per cent use a baseline percent hedged strategy. The firms indicate that the baselines for these benchmarks typically range from 50 per cent to 100 per cent hedged. Finally, 17.6 per cent of firms indicate that they do not have a benchmark for evaluating the FX risk management process.

Maturities of FX derivatives

Firms are asked to identify the percentage of their foreign currency derivatives of original maturities. Figure 16 displays the results of this question. The figure presents that short-term FX derivatives (less than one year) are used by a vast majority of firms at about 75.6 per cent. It is noticed that about 17 per cent of the firms use foreign currency derivatives with an original maturity of 90 days or less, 24.4 per cent use foreign currency derivatives with an original maturity of 91 to 180 days, 34 per cent use FX derivatives to the end of the current fiscal year and about 19.5 per cent use FX derivatives for one year to three years, while only about 5 per cent use foreign currency derivatives with maturities of more than three years. It is also found that firms tend to concentrate most of their FX derivatives usage at the short horizon, especially one year or less.

Transactions in FX derivatives markets

Firms are asked to indicate how often they transact in the foreign currency derivatives markets for hedging seven frequently cited exposures. These are foreign repatriations (dividends, royalties, interest payment), contractual commitments; both on-balance-sheet (i.e. payables and receivables) and off-balance-sheet (i.e. signed contracts pending), anticipated transactions one year or less, anticipated transactions beyond one year, competitive/economic exposure, arbitrage borrowing rates across currencies, and translation of foreign accounting.

Figure 17 presents the percentage of firms who daily, weekly, monthly, quarterly, or yearly transact in the foreign currency derivatives markets for each of these reasons. The figure shows that the most commonly cited reasons for transacting in the foreign currency derivatives markets are for hedging near-term at average 39.7 per cent, 26.4 per cent, and 22.1 per cent monthly, quarterly, and yearly, respectively.

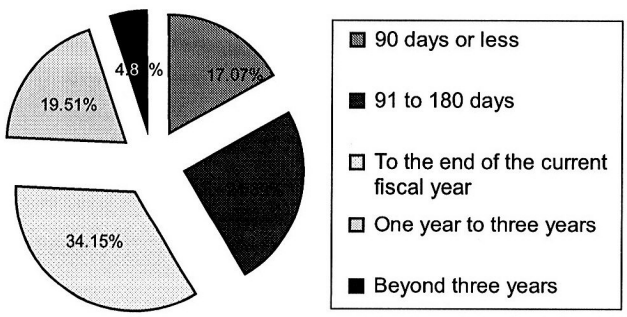

Figure 16.
Maturities of FX derivatives

The most commonly hedged exposures are off-balance-sheet commitments (83.3 per cent hedge monthly), translation of foreign accounting (77.8 per cent hedge yearly and 22.2 per cent hedge monthly), arbitrage borrowing rates across currency (67.7 per cent hedge monthly and 33.3 per cent hedge yearly), foreign repatriations (55.6 per cent hedge quarterly), on-balance sheet transactions (50 per cent hedge monthly, and 20 per cent hedge weekly), anticipated transactions expected beyond one year (40 per cent hedge quarterly, 30 per cent hedge monthly, and 20 per cent hedge yearly), competitive/economic exposures (40 per cent hedge monthly, 40 per cent hedge quarterly, 20 per cent hedge yearly), and the last reason is anticipated transactions expected one year or less (31.25 per cent hedge monthly, and 31.25 per cent hedge quarterly).

Effect of market view on FX rates

Firms are asked to indicate how often their market views cause them to alter the timing or size of their hedges or to actively take a position in the market using derivatives. The responses to this question are presented in Figure 18. The figure shows that 63.6 per cent and 45.45 per cent of the firms indicated that their market view on exchange rates monthly altered the size and the timing of the hedges that they entered into,

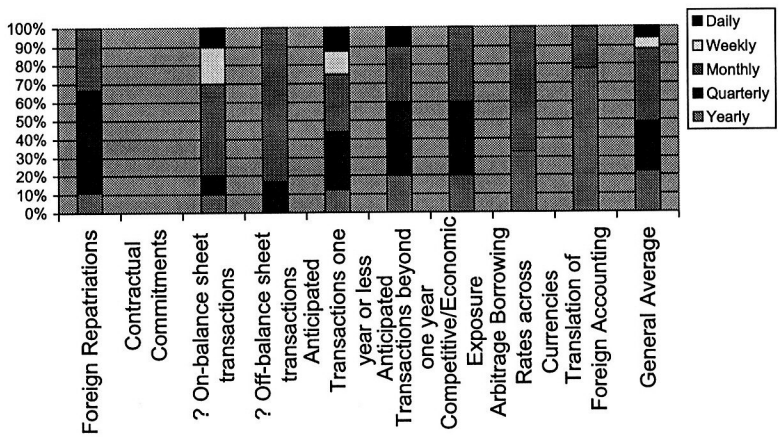

Figure 17.
Reasons of transactions in the FX derivatives for purposes hedging

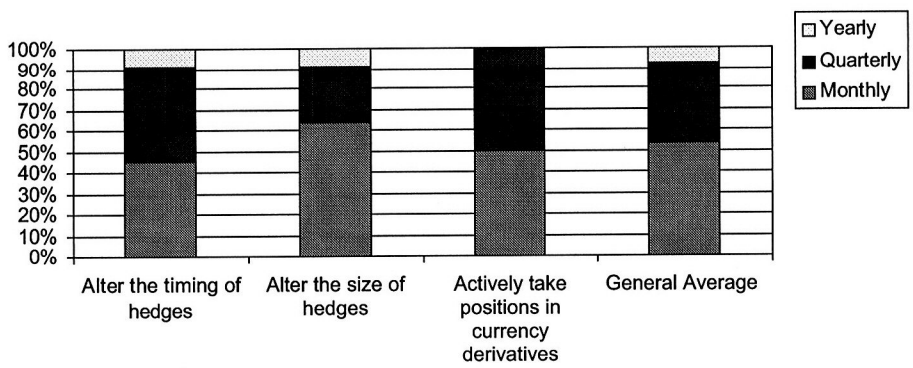

Figure 18.
Effect of market view on exchange rates

respectively. Also, 45.45 per cent and 27.30 per cent of the firms indicated that their market view on exchange rates quarterly alter the timing and the size of the hedges that they entered into, respectively. Only 9.10 per cent of the firms indicate that their market view on exchange rates yearly alter the timing or the size of the hedges that they entered into. Of the firms, about 50 per cent actively take positions in currency derivatives based on their market view of the exchange rates monthly or quarterly. Shortly, it is apparent that a majority of firms (about 54 per cent) monthly takes into account their view of market conditions when choosing an appropriate strategy of FX risk management.

Interest rate derivatives

Reasons of transactions in the IR derivatives markets

Figure 19 displays the results from our question about how often the firm transacts in the IR derivatives markets. The figure shows that a large number of the firms that use IR derivatives report using them to swap from floating-rate debt to fixed-rate debt at 41.2 per cent. However, only 14 per cent of the firms indicate that they do this weekly and 29 per cent of the firms indicate that they do this monthly, 57 per cent of the firms indicate that they use IR derivatives quarterly. On the other hand, just 23.5 per cent of the firms indicate that they use IR derivatives to swap from fixed-rate debt to floating-rate debt.

Nearly all firms do this quarterly. In addition to swapping existing debt, IR derivatives are also used by a significant proportion of firms to fix in advance the rate (or spread) on new debt issues as well as to take positions to reduce costs or lock-in-rates based upon a market view (at 23.5 per cent and 11.75 per cent, respectively). The figure also shows that 50 per cent and 25 per cent of the firms use IR derivatives to fix in advance the rate (spread) on new debt quarterly and monthly, respectively. Finally Figure 19 indicates that approximately half of the IR derivatives using firms do so in order to reduce costs based upon a market view quarterly and yearly.

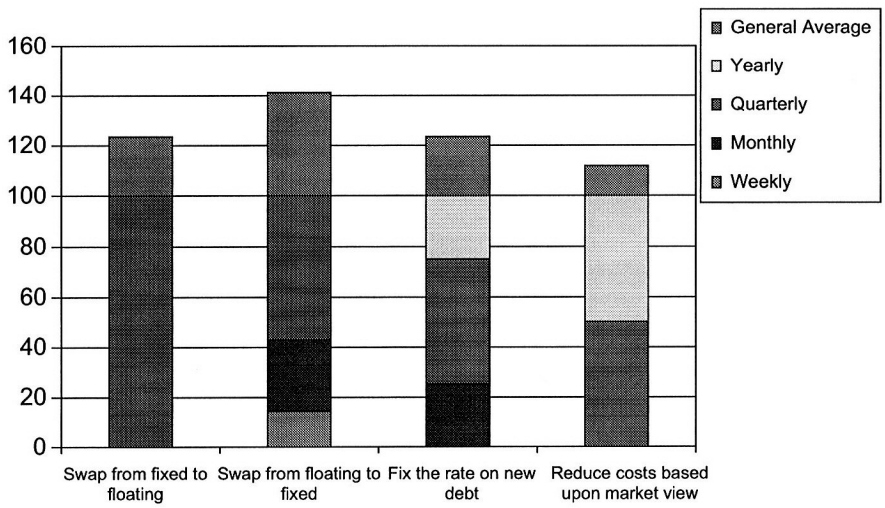

Figure 19.
Reasons of transactions in IR derivatives

Benchmark for evaluating the management of the debt portfolio
Firms are asked about the benchmark they use for evaluating the management of the debt portfolio and the use of Interest Rate derivatives. Figure 20 summarises the responses. Of the responding firms, about 50 per cent indicate that they do not use a benchmark for the debt portfolio. There are several options including the volatility of interest expense relative to a specified portfolio, realised cost of funds relative to a market benchmark (e.g. LIBOR), realised cost of funds relative to a bond portfolio with a specific duration, realised cost of funds relative to a bond portfolio with a specific ratio of fixed/floating debt and an open choice for firms to indicate a different benchmark they use. The figure shows that only half of the responding firms report that they use realised cost of funds relative to a market benchmark (e.g. LIBOR).

Option contracts
In this section, I am interested in exploring some aspects of options usage.

Types of options contracts used in the past 12 months
In addition to standard options (e.g. European or American styles), average rate (price) options, basket options, barrier options, contingent premium, and option combinations are widely available in the over-the-counter (OTC) market. Thus, firms are asked to indicate their usage over the past 12 months of a variety of different options across the three common types of risk, FX risk, IR risk, and CM risk. Figure 21 displays the results.

The figure shows that, of the firms using derivatives, 68.75 per cent indicate that they have used some form of options within the past 12 months. FX options are the most common, used by 65.3 per cent of the firms using derivatives, while IR and CM options are used by 30.4 per cent and 4.3 per cent of the firms using derivatives, respectively. The figure also shows that the instrument-specific responses indicate that the standard European-style (exercisable only at maturity) and American-style (exercisable any time up to maturity) options are the most commonly used, with 48 per cent of responding firms using European-style and 22 per cent using American-style options. The other kinds of options are used by 30 per cent only. Average rate options (which are different in that their payoffs are based upon the difference between the strike price and some average of the history of prices) are used with 17 per cent, option combinations, such as collars, straddles, etc. are used by 8.7 per cent and Barrier options (which come into existence or cease to exist when some price point is reached)

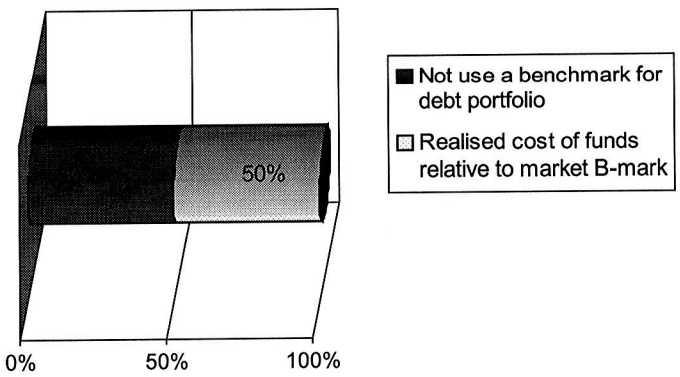

Figure 20.
Benchmark used for debt portfolio

are used by about 4 per cent of all derivatives users in the past 12 months. Another feature revealed by the figure is that options usage is heaviest in foreign currencies and interest rates. Currency-option usage is heaviest in the European-style (at 46.7 per cent), followed by the American-style (at 26.7 per cent), and followed by the average rate options (at 13.3 per cent). The commodity option usage is heaviest in the European-style (42.9 per cent) and followed by average rate options (at 28.6 per cent).

Control and reporting procedures

This section concentrates on some aspects regarding control and reporting policy.

The derivatives sources used

Firms obtain derivatives from a variety of sources including commercial banks, investment banks, special purpose vehicles (AAA subsidiaries established by investment banks and other institutions to offer derivatives), insurance companies, and exchanges or brokers. Firms are asked to rank these sources as preferred source, alternative source, and not a source. It is found that commercial banks are considered the most preferred source for more than 87 per cent of the responding firms vs only 10 per cent naming investment banks as a preferred source, while 60 per cent of the firms choose the investment banks as an alternative source. Figure 22 presents these responses.

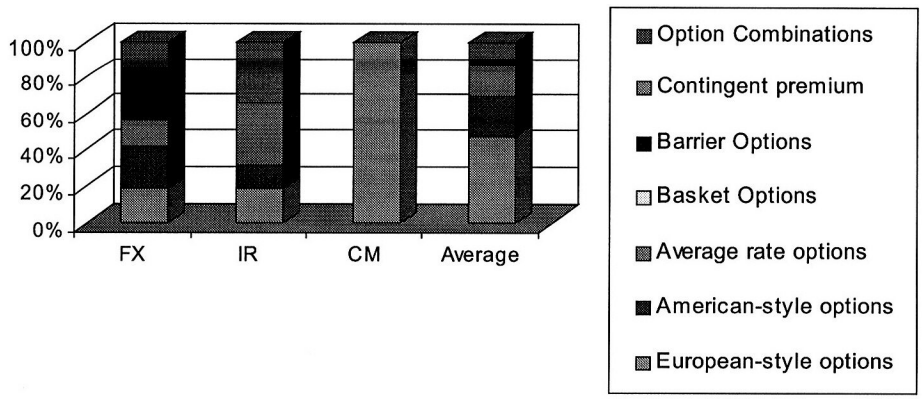

Figure 21.
Types of option contracts used in the past 12 months

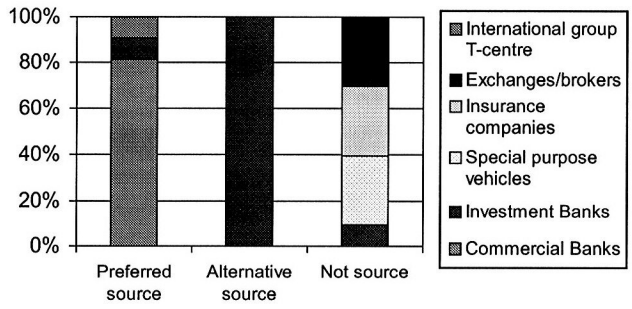

Figure 22.
Sources of derivatives

Published internal guidelines on the use of derivatives
Firms are asked whether they publish internal guidelines on the use of derivatives. Of the firms using derivatives, 75 per cent report they are publishing internal guidelines about the use of derivatives compared to 25 per cent of the firms that have not done so. Figure 23 displays this result.

Reporting about derivatives activity
Firms are asked how frequently derivatives activity is reported to the board of directors. Figure 24 presents the responses. The figure shows that 31 per cent of the firms report to the board of directors monthly, 25 per cent of the firms indicate that they report to the board of directors quarterly, 18.75 per cent of the firms report to the board of directors annually, and the same percentage reports to the board of directors as needed. It is noticed that little proportion (6.25 per cent) does not know how frequently derivatives activity is reported to the board of directors.

Valuing derivatives portfolio
Firms are asked to indicate how frequently they value their derivatives portfolio. Figure 25 presents the responses.

The figure shows that a significant proportion of the firms, 50 per cent, is valuing their derivatives portfolio monthly, 12.5 per cent revalue quarterly and 6.25 per cent revalue yearly. It is noticed that a significant proportion of the firms is revaluing their derivatives portfolio as needed.

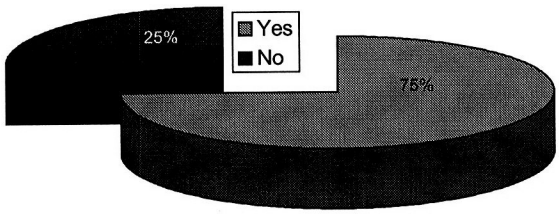

Figure 23.
Published internal guidelines on the use of derivatives

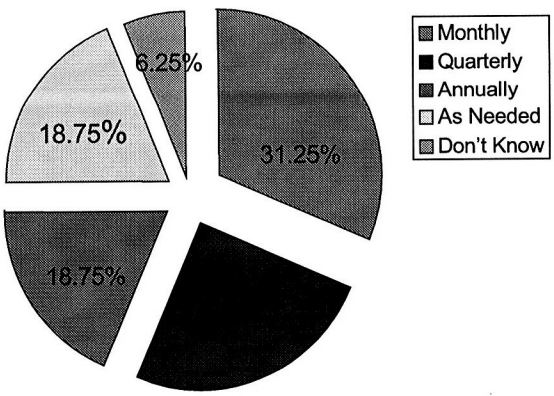

Figure 24.
Reporting about derivatives activity by board of directors

Counterparty default risk

Firms are asked to identify whether the firm has ever experienced a default by a counterparty on a derivatives contract. As shown in Figure 26, about 94 per cent of the firms have never experienced a default by a counterparty on a derivatives contract compared to only 6 per cent that have experienced such a default. The following figure presents the responses.

Methods of evaluating the riskiness of derivatives transactions

Finally, firms are asked to indicate the methods used for evaluating the riskiness of the derivatives transactions or portfolios. The results are displayed in Figure 27. The figure shows that the most common method is the value at risk (VaR) approach. This is the method of 69 per cent of the respondents. Of firms, 15.4 per cent indicate that they evaluate the riskiness of the derivatives portfolios by price value of a basis point. While 7.7 per cent of the respondents indicate they use Stress testing or scenario analysis, no firm uses option sensitivity measures.

Conclusions

This paper presents the results of a questionnaire survey, which focuses on determining the reasons for using or not using derivatives for 401 UK nonfinancial

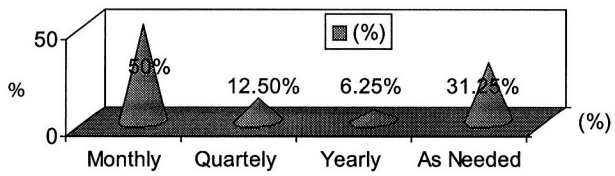

Figure 25.
How frequently the firm values derivatives portfolio

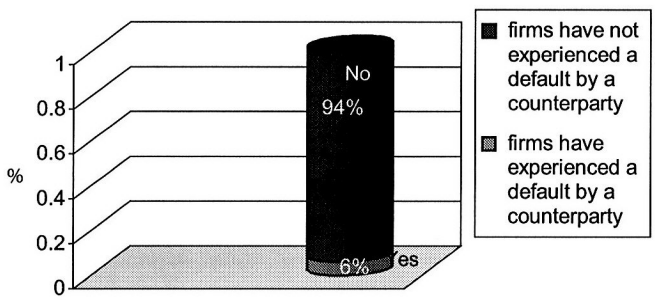

Figure 26.
Counterparty default risk

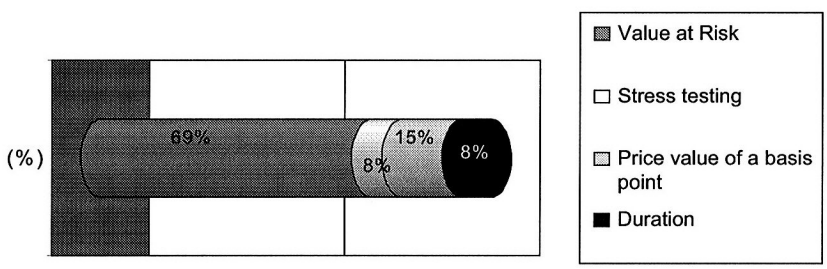

Figure 27.
Methods of evaluating the riskiness of derivatives portfolio

companies. Further, the study surveys risk management practices in the UK market. The questionnaire is based on some of the prior studies/surveys on similar topics. In this study, corporate treasurers are asked a number of questions relating to the following areas: derivatives use, currency derivatives, interest rate derivatives, options contracts, and control and reporting policy. In addition, the characteristics of firms using derivatives and the most common types of derivatives and risks are examined. The results indicate that larger firms are more likely to use derivatives than medium and smaller firms. This result is consistent with the results of previous studies in the research area. In the ownership dimension, public companies are more likely to use derivatives than private firms. In the organisational form dimension, derivatives usage is greatest among multi-site firms and international firms. The study indicates that one third of firms do not use derivatives because their exposures are not significant and that the most important reasons why they do not use derivatives are concerns about disclosures of derivatives activity required under FASB rules; concerns about the perceptions of derivatives use by investors, regulators, analysts; or the public and costs of establishing and maintaining derivatives programmes exceeding the expected benefits.

The results reveal that centralised risk management activities are overwhelmingly most common and that, for firms using derivatives, foreign exchange (FX) risk is the risk most commonly managed with derivatives. Interest rate (IR) risk is the next most commonly managed risk. The results also indicate that lack of knowledge about derivatives is the aspect causing the most concern among derivatives users. It is found that the most important reason for using hedging with derivatives is managing the volatility in cash flows, and the market value of the firm is considered the second most important reason of using derivatives for hedging purposes. This is followed with managing the volatility in accounting earnings and managing balance sheet accounts or ratios. The study also shows that the most common instrument to hedge the exposure for contractual commitments or repatriations is options and this is followed with forwards/futures and swaps.

In addition, firms are asked about the benchmark they use for evaluating foreign currency risk management over the budget/planning period. They report that the most common benchmark is the use of spot rates at the beginning of the budget/planning period. Further, firms are asked to indicate how often their market views cause them to alter the timing or size of their hedges or to actively take a position in the market using derivatives. The results indicate that firms' market view on exchange rates monthly alter the size and the timing of the hedges that they entered into. Additionally, firms are asked to indicate their usage over the past 12 months of a variety of different options across the three common types of risk, FX risk, IR risk, and CM risk. The study shows that a high proportion of derivatives users indicates that they have used some form of options within the past 12 months. FX options are the most common, and then IR and CM options. Finally, firms are asked whether they publish internal guidelines on the use of derivatives. It is found that the majority of the firms using derivatives report they are publishing internal guidelines about the use of derivatives. The unique aspect of the paper is that it investigates this important issue outside of the US. However, it should be noted that a great deal more work is required in this area, especially estimating and managing foreign exchange exposure and interest rate exposure and their determinants of UK companies.

References

Adedeji, A. and Baker, R. (2002), "Why firms in the UK use interest rate derivatives", *Managerial Finance*, Vol. 28 No. 11, pp. 53-74.

Alkebäck, P. and Hagelin, N. (1999), "Derivatives usage by nonfinancial firms in Sweden with an international comparison", *Journal of International Financial Management and Accounting*, Vol. 10 No. 2, pp. 105-20.

Belk, P.A. and Edelshain, D.J. (1997), "Foreign exchange risk management: the paradox", *Managerial Finance*, Vol. 23 No. 7, pp. 5-24.

Belk, P.A. and Glaum, M. (1990), "The management of foreign exchange risk in UK multinationals: an empirical investigation", *Accounting and Business Research*, Vol. 21 No. 81, pp. 3-13.

Berkman, H., Bradbury, M.E. and Magan, S. (1997), "An international comparison of derivatives use", *Financial Management*, Vol. 26 No. 4, pp. 69-73.

Berkman, H., Bradbury, M.E., Hancock, P., and Innes, C. (2002), "Derivative financial instrument use in Australia", *Accounting and Finance*, Vol. 42 No. 2, pp. 97-109.

Bodnar, G.M. and Gebhardt, G. (1999), "Derivatives usage in risk management by US and German nonfinancial firms: a comparative survey", *Journal of International Financial Management and Accounting*, Vol. 10 No. 3, pp. 153-87.

Bodnar, G.M. Hayt, G.S., Marston, R.C., and Smithson, N. (1995), "How corporations use derivatives", *Financial Management*, Vol. 24 No. 2, pp. 104-25.

Bodnar, G.M., Hayt, G.S., and Marston, R.C. (1996), "1995 Wharton survey of derivatives usage by US non-financial firms", *Financial Management*, Vol. 25 No. 4, pp. 113-33.

Bodnar, G.M., Hayt, G.S., and Marston, R.C. (1998), "1998 Wharton survey of financial risk management by US nonfinancial firms", *Financial Management*, Vol. 27 No. 4, pp. 70-91.

Ceuster, M., Durinck, E., Laveren, E., and Lodewyckx, J. (2000), "A survey into the use of derivatives by large nonfinancial firms operating in Belgium", *European Financial Management*, Vol. 6 No. 3, pp. 301-18.

Clark, E. (2002), *International Finance*, 2nd ed., Thomson, London.

Dhanani, A. (2003), "Foreign exchange risk management: a case in the mining industry", *The British Accounting Review*, Vol. 35 No. 1, pp. 35-63.

Fatemi, A. and Glaum, M. (2000), "Risk management practices of German firms", *Managerial Finance*, Vol. 26 No. 3, pp. 1-16.

Froot, K., Scharfstein, D., and Stein, J. (1993), "Risk management: coordinating corporate investment and financing policies", *Journal of Finance*, Vol. 48 No. 5, pp. 1629-48.

Gay, G. and Nam, J. (1998), "The underinvestment problem and corporate derivatives use", *Financial Management*, Vol. 27 No. 4, pp. 53-69.

Géczy, C., Menton, B.A., and Schrand, C. (1997), "Why firms use currency derivatives", *Journal of Finance*, Vol. 52 No. 4, pp. 1325-54.

Grant, K. and Marshall, A.P. (1997), "Large UK companies and derivatives", *European Financial Management*, Vol. 3 No. 2, pp. 191-208.

Guay, W. (1999), "The impact of derivatives on firm risk: an empirical examination of new derivatives users", *Journal of Accounting and Economics*, Vol. 26 No. 1-3, pp. 319-51.

Haushalter, G. (2000) "Financing policy, basis risk, and corporate hedging: evidence from oil and gas producers", *Journal of Finance*, Vol. 55 No. 1, pp. 107-52.

Howton, S.D. and Perfect, S.B. (1998), "Currency and interest-rate derivatives use in US firms", *Financial Management*, Vol. 27 No. 4, pp. 111-21.

Jalilvand, A. (1999), "Why firms use derivatives: evidence from Canada", *Canadian Journal of Administrative Sciences*, Vol. 16 No. 3, pp. 213-28.

Jalilvand, A., Switzer, J., and Tang, C. (2000), "A global perspective on the use of derivatives for corporate risk management decisions", *Managerial Finance*, Vol. 26 No. 3, pp. 29-39.

Joseph, N.L. (2000), "The choice of hedging techniques and the characteristics of UK multinationals industrial firms", *Journal of Multinational Financial Management*, Vol. 10 No. 2, pp. 161-84.

Joseph, N.L. and Hewins, R.D. (1997), "The motives for corporate Hedging among UK multinationals", *International Journal of Finance and Economics*, Vol. 2 No. 2, pp. 151-71.

Karpinsky, A. (1998), "The risky business of risk management derivatives disasters: revisited", *Australian Banker*, Vol. 112 No. 2, pp. 60-6.

Khim, E.M. and Liang, D.L. (1997), "The use of derivative financial instruments in company financial risk management: the Singapore experience", *Singapore Management Review*, Vol. 19 No. 2, pp. 17-44.

Marshall, A.P. (2000), "Foreign exchange risk management in UK, USA and Asia Pacific multinational companies", *Journal of Multinational Financial Management*, Vol. 10 No. 2, pp. 185-211.

Mian, S.L. (1996), "Evidence on corporate hedging policy", *Journal of Financial and Quantitative Analysis*, Vol. 31 No. 3, pp. 419-39.

Nance, D.R., Smith, C.W., and Smithson, C.W. (1993), "On the determinants of corporate hedging", *The Journal of Finance*, Vol. 48 No. 2, pp. 267-84.

Nguyen, H. and Faff, R. (2002), "On the determinants of derivatives usage by Australian companies", *Australian Journal of Management*, Vol. 27 No. 1, pp. 1-24.

Phillips, A.L. (1995), "1995 Derivatives practices and instruments survey", *Financial Management*, Vol. 24 No. 2, pp. 115-25.

Prevost, A., Rose, L., and Miller, G. (2000), "Derivatives usage and financial risk management in large and small economies: a comparative analysis", *Journal of Business Finance and Accounting*, Vol. 27 No. 5-6, pp. 733-59.

Shu, P. and Chen, H. (2002), "Corporate derivatives use in the electronic industry of Taiwan", working paper, Fu-Jen University: Taiwan.

Singh, K. (1999), *The Globalisation of Finance: A Citizens Guide*, Zed Books Ltd, London.

Smith, C. and Stulz, R. (1985), "The determinants of firms hedging policies", *Journal of Financial and Quantitative Analysis*, Vol. 20 No. 4, pp. 391-405.

Stulz, R. (1996), "Rethinking risk management", *Journal of Applied Corporate Finance*, Vol. 9 No. 3, pp. 8-24.

Tufano, P. (1996), "Who manages risk: an empirical examination of risk management practices in the gold mining industry", *Journal of Finance*, Vol. 51 No. 4, pp. 1097-137.

Voit, J. (2001), *The Statistical Mechanics of Financial Markets*, Spinger, London.

Watson, D. and Head, T. (1998), *Corporate Finance: Principles and Practice*, Pearson Education Ltd, Essex.

Wilmott, P. (1998), *Derivatives*, New York, J. Wiley.

Corresponding author
Ahmed A. El-Masry can be contacted at: ahmed.el-masry@plymouth.ac.uk