

Management Motivation for Using Financial Derivatives in Australia

by

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Abstract:

This study takes a direct approach to determine management motivation for the use of financial derivatives. We survey a sample of Australian firms on attitudes to derivative use and financial risk management. Management views are sought on the importance of a series of theoretical reasons for using derivatives. Generally, we find that managers are focused on the broad reduction of risk and volatility of cash flows and earnings in using derivatives. Specific issues such as reducing bankruptcy costs, debt levels and taxation are not considered as important. A further interesting result from this research is that even though firms may use derivatives they may not necessarily hedge all of their annual exposures across different financial risks. This helps explain the inconsistency of results in many empirical studies on the determinants of derivative use.

Keywords:

DERIVATIVES; RISK MANAGEMENT; HEDGING; FINANCIAL RISK.

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1. Introduction

Positive theories to explain financial risk management require a considerable number of assumptions concerning the objectives of management. Due to the complex agency relationships within the firm, management objectives could include maximising the wealth of numerous stakeholders such as shareholders, debtholders and management. Irrespective of whether these objectives are mutually exclusive or independent, the firm can be influenced in many direct and indirect ways by financial risks. Movements in exchange rates, interest rates and commodity prices may affect stakeholders' value in many different ways. Financial derivatives are one avenue for firms to manage financial risks and are often used to hedge exposures to foreign-currency, interest-rate and commodity-price movements.

In this study a direct approach is taken to the determination of why firms use derivatives. A sample of managers of Australian publicly listed firms is surveyed to determine incentives for the use of derivatives. Theoretical incentives are incorporated and managements' views requested on the importance of these variables. The types of financial risks that are managed are also assessed. Data is collected on the types of derivative contracts used and the extent to which management use derivatives to cover their financial exposure. Consideration is given as to how management assess their risk exposure and how much of the exposure is covered. The results are considered in the context of the empirical evidence on financial risk exposure.

The paper is organised as follows. Section 2 provides a brief review of the literature. Section 3 details the data and method and section 4 provides a discussion of the results. Section 5 provides a conclusion to the work.

2. Literature Review

Management have incentives to implement risk management policies if the value of the firm can be increased. A review of literature shows that there are theoretical reasons to support risk management at the firm level. These reasons are discussed in the context of the following key statements:

- Risk management may reduce financial distress costs and agency costs;
- There are economies of scale if risk management is undertaken at the firm level rather than the shareholder level;
- Different taxation rates between individuals and firms result in different outcomes; and
- Risk management may assist the firm in minimising the costs of external financing.

Generally, these factors are regarded as breaches of the assumptions underlying the work of Modigliani and Miller (1958).

Financial risks can increase the cost of financial distress (Smith & Stulz 1985). Increases in financial risks may increase the volatility in earnings, which may result in the breach of debt covenants, signalling financial distress. Risk

management may reduce volatility of earnings resulting in a reduction in the probability of bankruptcy and hence financial distress costs.

There are a number of agency issues that may be relevant in the context of risk management. Myers (1977) argues that firms with high leverage may reject positive net present value projects because of the risk that the benefits will accrue to the debtholders and not shareholders. In this instance management will prefer higher risk projects. Hence risk management policies protect the interests of the shareholders by reducing the volatility of firm value and reducing the agency costs. Other agency issues arise where the manager has a substantial human capital invested in the firm. The investment decisions lies in the protection of the managers' position and positive net present value projects are potentially rejected. Therefore, from a manager's perspective reducing risks faced by the firm may reduce the risks faced by management (Stulz 1984; Smith & Stulz 1985).

Risk management may also be relatively more costly for individuals as it requires considerable expertise that may only be viable on a large scale. In addition, shareholders are unlikely to have sufficient information about firm activity to be able to implement risk management strategies in a timely manner. Information available to shareholders is only a snapshot of firm activity and managers are more likely to be in a better position to make more timely decisions about risk management.

Reducing exposure to financial risks may also reduce income tax through reductions in taxable income. In a progressive tax system, high volatility in taxable income will result in an increase in the overall taxation expected to be paid and hence a decrease in firm value. Hedging reduces the volatility of taxable income and therefore reduces expected taxes. Smith and Stulz (1985) discuss the effect of the convexity in the tax schedule being at zero taxable income when tax losses are not treated equally as tax gains. The benefit from a tax loss is not immediately available but tax on a gain is immediately payable. If firms can adopt a policy that results in the minimisation of losses and the maximisation of tax credits then the expected income tax can be reduced. In addition, firms may be exposed to a taxation system that differs from individuals. Firms may be able to claim losses from risk management strategies against taxable income whereas individuals may not always be allowed to claim capital losses against personal income.¹

Reducing exposure to financial risks may increase shareholder value by harmonising financial and investment decisions (Froot, Scharfstein & Stein 1993). When raising external capital is costly due to transaction costs, firms may underinvest. Derivatives can be used to increase shareholder value by coordinating the need for and availability of internal funds. Risk Management can reduce underinvestment costs by reducing the volatility of firm value.

Although the arguments presented above are theoretically sound the empirical evidence is inconsistent (Nance, Smith & Smithson 1993; Tufano 1996; Geczy, Minton & Schrand 1997). In the Australian context Nguyen and Faff (2002, 2003) find that a firm's leverage, size and liquidity are important determinants of derivative use, but many other variables do not show their theoretically predicted significance. However, their evidence is consistent with firms seeking to maximise shareholder value rather than managerial wealth. Similarly, Berkman, Bradbury,

1. In Australia there is a flat corporate tax rate but tax losses are not treated in the same way as tax gains. Personal taxation is progressive but it is assessed differently from corporate taxation.

Hancock and Innes (2002) also find size and leverage as key variables in the explanation of derivative use in a sample of Australian firms. They acknowledge limited support for the theoretical reasons for derivative use.

More recently Guay and Kothari (2003), in a study of large U.S. corporations, examine the amount of financial exposure managed with derivatives. They find that the cash flow generated from a derivative portfolio is relatively small in comparison to economic exposure and operating cash flows. They argue an increase in firm value is not driven by derivative investment and derivatives are a noisy proxy for risk management. Hence the previous empirical results show little support for theoretical reasoning.

The majority of the empirical studies that attempt to identify the determinants of derivative use obtain data from annual financial statements. Disclosure in financial statements regarding derivative use can be limited. Firms disclose the value of derivatives at year-end. It is feasible that a long and short position at this time results in a net value of zero. Similarly, the year-end position is not necessarily representative of the firm's derivative and risk management policy throughout the year.

Many surveys of derivative activity simply obtain details about attitudes towards financial risks and/or choices in derivative use and not about the determinants of derivative use (Bodnar, Marston & Hayt 1998; Marshall 2000; Faff & Marshall 2002). Among studies using Australia data Marshall (2000) and Faff and Marshall (2002) investigate only multinationals and foreign exchange exposure.

3. Data and Method

The top 500 listed companies in Australia were sampled through a mailed questionnaire.² The details of each company were obtained from Huntley's database and the questionnaire was mailed to the CEO or CFO of each company in June 2000. A self-addressed and stamped envelope was provided. One hundred useable responses were received representing a response rate of approximately 23%.³ A comparison between early and late responses did not reveal any significant differences in results. Although this does not alleviate non-response bias it is unlikely to be a major concern, so a follow-up questionnaire was not distributed.

The questionnaire was divided into four key areas. The aim in the first section was to determine if management had a risk management plan, if they used derivatives and if the main purpose for derivative use was for: i) hedging; or ii) speculation and/or arbitrage. In the second section 19 theoretical reasons for the use of derivatives for hedging purposes were listed and respondents were requested to indicate the perceived importance of each of these reasons. In the third section of the questionnaire the financial risks were categorised in terms of foreign exchange risk, interest rate risk, commodity price risk and other financial risks. Initially, management were asked if they hedged these types of risks. Within each

2. A copy of the questionnaire is available on request.

3. From the original sample of 500, 50 were excluded as overseas companies, 13 could not be contacted, eight declined to participate, leaving 429 companies. The response rate is similar to other studies (Lee, Marshall, Szto & Tang 2001; Bodnar, Marston & Hayt 1998).

categorisation, questions addressed the existence of exposure, the benchmark for evaluating risk management, the types of derivative contracts used and the percentage of exposure that is typically hedged. Lastly, in section four the information on the techniques applied in the risk management of derivatives was requested.

4. Results and Discussion

4.1 Derivative Use

The questionnaires indicate 76 (76%) of the respondents use derivatives and 24 (24%) do not use derivatives. This proportion of derivative use is consistent with Nguyen and Faff (2003) who report evidence of derivative use in 74.2% of their sample. Although Berkman et al. (2002) report evidence of derivative use in only 55% of their sample this may be due to a sampling issue.^{4,5} The responses are categorised based on Australian Stock Exchange industry classifications and these results are presented in table 1. The classifications are banking, industrial, investment, miscellaneous, property, resource and retail.⁶ All respondents from banking and property sectors state they are derivative users. The proportion of users and non-users is spread across the other sectors. This is similar to that reported in other studies.⁷

Table 1
Sample Descriptive Statistics

Industry Classification	Derivative Users	Non-Derivative Users	Total
Banking	6	0	6
Industrial	9	2	11
Investment	7	2	9
Miscellaneous	22	13	35
Property	10	0	10
Resource	15	4	19
Retail	7	3	10
Total usable response	76	24	100

4. A reason for the difference in derivative use is that Berkman et al. (2002) randomly sample from Australian listed firms whereas Nguyen and Faff (2003) sample from the largest 500 Australian listed firms. Derivative use has regularly been linked with firm size.
5. Other studies report varying levels of derivative use:
U.S. = 65% (large non-financial Fortune 500 firms) (Bodnar, Marston & Hayt 1998) and U.K. = 80% (FTSE250 firms) (Grant & Marshall 1997).
6. Due to the unique nature of derivative use in the banking industry tests are initially conducted excluding banks and financial institutions. These respondents are also those that use derivatives for speculation and/or arbitrage as well as hedging. The results are not sufficiently different to report separately.
7. Due to the small sample sizes in the industry groups, individual industry analysis is not conducted.

4.2 Motivations for Derivative Use

Users and non-users were asked to consider 19 issues regarding the use of derivatives for hedging. For each issue, users and non-users were asked to rank on a five-point *Likert* scale the importance of derivatives for hedging. The issues and responses are summarised in table 2. The issues are similar with those used by Brailsford, Heaney and Oliver (2003) and have been developed from the relevant literature. Management wealth was addressed by separate reference to risk and compensation. Firm value was assessed through items addressing the volatility of future cash flows and earnings, financial distress costs, taxation and cost of capital. Further items recognised the impact of the use of debt finance, budgetary policies, the accountability and evaluation of management via financial statement disclosure and accounting ratios. Reporting and budgetary assessments require derivative valuations and corporate governance may impose restrictions creating legal issues and political pressures for firms regarding derivative use. These restrictive issues associated with derivative use were also listed. The existence of alternatives for risk management was also recognised.

The level of importance for each issue was obtained by multiplying the numbers of responses on each *Likert* value for each issue. Following this, means and standard deviations were calculated. Based on the mean value, the most important reason regarding the use of derivatives for hedging is for 'changing the volatility of cash flows' (lowest mean score = 2.17). This is followed by 'changing the volatility of accounting earnings' (mean = 2.20). These two issues are consistent with the third most important issue of 'improving the value of the firm' (mean = 2.40) and then 'reducing risks faced by management' (mean = 2.41). The least most important use of derivatives for hedging is regarded as 'improving management/employee compensation' (mean = 4.46), followed by 'reducing taxation' (mean = 4.19), 'complexity of accounting treatment' (mean = 4.16) and 'legal restrictions on the use of derivatives' (mean = 4.10). The responses to these issues generally support the theoretical arguments of firms focussing on the management of cash flows and maximising firm values. Specific incentives that are emphasised in the empirical literature such as reducing taxation and the reduction of financial distress costs are ranked as relatively unimportant. However, the link with distress and cash flow volatility is recognised. Similarly, improving management/employee compensation is ranked as relatively unimportant although there is a potential problem with a response bias on this issue. Management are unlikely to display personal financial incentives. Indirect support for management incentives is indicated through a high ranking on the issue of risk reduction for management. This supports the theory that managers are not sufficiently diversified due to their high investment in human capital in the firm and regard derivatives as a way of reducing their risks.

The range of level of importance across the different issues is shown in the last five columns of table 2. The broad range indicates that it is unlikely that any one theory for hedging is going to find consistent empirical support. Given the results in table 2, the inconsistency of results in other empirical studies is understandable. Derivatives are used for many different purposes, and as will be shown later, in many different ways over a broad range of risks and to cover a broad range of exposures. It is posited here that the use of derivatives is likely to be

the result of complex agency relationships within the firm and that derivative use is not driven by any one particular management objective.

Table 2
Summary of Responses in Relation to Derivative Use from Both Non-Derivative Users and Derivative Users (Ranked on Mean Response)

Issues	N ⁸	Mean	Std Dev.	Rank	Number of Responses				
					Most important < > Least Important				
					1	2	3	4	5
Change volatility of cash flows	89	2.17	1.32	1	39	20	14	8	8
Change the volatility of accounting earnings	88	2.20	1.26	2	29	35	11	3	10
Improve value of firm	89	2.40	1.22	3	21	35	19	4	10
Reduce risks faced by management	88	2.41	1.34	4	27	27	16	7	11
Reduce the cost of capital	86	3.08	1.26	5	6	28	23	11	18
Budgeting purposes	88	3.11	1.17	6	4	29	22	19	14
The firm has alternative means to manage financial risks	85	3.47	1.29	7	6	14	26	12	27
Change balance sheet accounts or ratios	86	3.57	1.15	8	2	15	26	18	25
Reduce bankruptcy and financial distress	85	3.73	1.37	9	8	11	13	17	36
The perceptions of derivative use by investors, regulators and the public	86	3.83	1.16	10	2	11	21	18	34
Reduce the use of debt finance	84	3.92	1.15	11	4	5	20	20	35
Reduce political risk/pressure	86	3.95	1.15	12	0	2	11	18	54
Increase the use of debt finance	85	4.00	1.07	13	2	5	21	20	37
The disclosure requirements	87	4.06	1.03	14	1	5	22	19	40
There are difficulties in pricing and valuing derivatives	86	4.08	1.03	15	1	5	21	18	41
Legal restrictions on the use of derivatives	87	4.10	1.06	16	4	2	14	28	39
The necessary accounting treatment is too complex	85	4.16	1.09	17	2	5	17	14	47
Reduce taxation	86	4.19	1.01	18	2	5	10	27	42
Improve management/employee compensation	85	4.46	0.81	19	0	2	11	18	54

8. This number represents the number of usable responses on the particular issue. Respondents did not provide a response on all issues.

The responses on the importance of the 19 issues listed in table 2 are classified into responses applicable to derivative users and non-derivative users and are shown in table 3. The purpose here is to identify if users of derivatives have a different level of importance in relation to the purposes of derivative use relative to non-users. The first column of table 3 states the issues and the second sub-column is the sample size of users and non-users. The next four sub-columns are mean responses and standard deviation of responses for users and non-users respectively. The final two columns of table 3 detail the results of a *t*-test on differences in means.⁹

For derivative users (column 4 of table 3) the three most important issues regarding the use of derivatives for hedging are to 'change the volatility of accounting earnings' (mean score = 2.22), 'change the volatility of cash flows' (mean score = 2.22) and 'improve the value of the firm' (mean score = 2.33). The three least important issues for derivative users are 'improve management/employee compensation' (mean score = 4.52), 'reduce taxation' (mean score = 4.32) and the 'complexity of accounting treatment' (mean score = 4.25). These rankings are the same as for the combined sample.

For non-derivative users (column 5 of table 3), the three most important issues regarding the use of derivatives for hedging are to 'change the volatility of cash flows' (mean score = 1.94), 'change the volatility of accounting earnings' (mean score = 2.13) and 'reduce the risks faced by management' (mean score = 2.50). The three least important issues are to 'improve management/employee compensation' (mean score = 4.19), 'legal restrictions on the use of derivatives' (mean score = 3.94) and 'increase the use of debt finance' (mean score = 3.89).

There are some variations in rankings between users and non-users, more so in the less important rankings. The four most important reasons listed by each subgroup are equivalent. This indicates that the important issues associated with derivative use are not affected by whether the firm actually uses derivatives or not. The decision to use derivatives is likely to be determined exogenously, based on the financial risk exposure faced by each firm as well as the interplay of the agency relationships within the firm. However, there is some difference between users and non-users on some of the issues. The results from the *t*-tests indicate a significant difference at the 10% level between users and non-users of derivatives for 3 of the 19 issues. Derivative users consider reducing taxation, reducing the use of debt finance and difficulties in pricing and valuing derivatives less important reasons for using derivatives than do non-derivative users. These results are consistent with responses from public sector organisations surveyed in Brailsford, Heaney and Oliver (2003). It is not unexpected that non-users would perceive difficulty in pricing derivatives to be more important than users. However, the derivative pricing issue is still relatively unimportant for both. It is interesting to note that reducing taxation and reducing the use of debt finance are two reasons considered in the literature as determinants of derivative use. For example Geczy, Minton and Schrand (1997) use long-term debt ratio as a proxy for assessing bankruptcy costs

9. The Levene's test for equality of variance is first conducted to determine whether a *t*-test assuming equal variance or unequal variance is required. Also, a non-parametric Kruskal-Wallis test is undertaken to provide further support for the *t*-test results. In all cases the Kruskal-Wallis test leads to similar conclusions to the *t*-test results. The results are not reported.

Table 3
Comparison of Issues Relating to Derivative Use From Users and Non-Users of Derivatives

Issues	N ¹⁰		Mean		Std.Dev.		t-Test for p-Value	
	Derivative User	NonUser	Derivative User	NonUser	Derivative User	NonUser	Equality of Means (t)	
Change the volatility of accounting earnings	72	16	2.22	2.13	1.28	1.20	0.277	0.782
Change the volatility of cash flows	73	16	2.22	1.94	1.37	1.12	0.871	0.392
Change balance sheet accounts or ratios	70	16	3.64	3.25	1.20	0.86	1.523	0.138
<i>Reduce taxation</i>	71	15	4.32	3.53	0.89	1.30	2.243	0.039
Reduce bankruptcy and financial distress	69	16	3.75	3.63	1.39	1.36	0.335	0.738
<i>Reduce the use of debt finance</i>	70	14	4.01	3.43	1.08	1.40	1.756	0.083
Increase the use of debt finance	70	15	4.03	3.87	1.09	0.99	0.530	0.598
Reduce the cost of capital	70	16	3.03	3.31	1.27	1.20	-0.813	0.418
Improve management/employee compensation	69	16	4.52	4.19	0.82	0.75	1.498	0.138
Improve value of the firm	73	16	2.33	2.75	1.21	1.24	-1.253	0.214
Budgeting purposes	72	16	3.18	2.81	1.20	0.98	1.141	0.257
Reduce political risk/pressure	70	16	4.03	3.63	1.14	1.15	1.274	0.206
The firm has alternative means to manage financial risks	69	16	3.52	3.25	1.24	1.48	0.759	0.450
<i>There are difficulties pricing and valuing derivatives</i>	70	16	4.21	3.50	0.95	1.21	2.581	0.012
The disclosure requirements of accounting standards	71	16	4.13	3.75	1.01	1.06	1.332	0.187
Legal restrictions on the use of derivatives	71	16	4.14	3.94	1.07	1.00	0.693	0.490
The necessary accounting treatment is too complex	69	16	4.25	3.81	1.06	1.17	1.445	0.152
The perceptions of derivatives use by investors, regulators and the public	70	16	3.89	3.56	1.11	1.36	1.006	0.318
Reduce risks faced by management	72	16	2.39	2.50	1.34	1.37	-0.299	0.765

and also assess the importance of taxation schedules. Given that users do not perceive these issues to be as important as others we suggest the practical application of these concepts is limited. The value impact of these items as a result of derivatives contracts may also be minimal, consistent with Guay and Kothari's

10. This number represents the number of usable responses on the particular issue. Respondents did not provide a response on all issues.

(2003) findings that the cash flow effect of derivatives is relatively small. From a manager's perspective perhaps specific value impact items are not considered important. Management appears to focus on the broader issue of reduction in volatility and risk.

Documented financial risk management plans are an important aspect of risk management. The questionnaire asked respondents whether their organisation had a risk management plan. Of the 76 firms using derivatives nearly 12% (9 firms) indicated that they did not have a documented financial risk management plan or policy. Eight of these firms were using derivatives for hedging only and not for speculation or arbitrage (one firm did not respond to the purpose of derivative use).

The extent of firms without a risk management plan and using derivatives is surprising given the risks associated with derivative use and the publicity surrounding their use. It is argued here that organisations that have a documented risk management plan have considered in more detail financial risk management issues relative to organisations that do not have a documented risk management plan. A comparison of the responses to the importance of the 19 issues from respondents with and without a risk management plan is reported in table 4.

Results indicate a significant difference between the two sub-groups on two issues: 'reducing taxation' and 'reducing the cost of capital'. Respondents with a management plan find reducing taxation a relatively unimportant reason for the use of derivatives for hedging, whereas respondents without a plan have a higher (more important) ranking for this issue, although both consider the issue relatively unimportant. This result is consistent with comments above that the possible financial impact of derivative use on tax is perceived to be minimal. The use of derivatives to reduce the cost of capital is more important for those with a plan and is the fourth most important issue for this group. This reason is considered to be important from a theoretical perspective. Generally, the results are consistent irrespective of whether the firm has a risk management plan or not or whether it uses derivatives or not.¹¹

4.3 *Categorised Financial Risks*

Firms were requested to indicate the type of technique they use (if any) to hedge financial risk. The risks listed were: Foreign exchange risk, interest rate risk, commodity price risk and other financial risks. Within each of these categories firms were then requested to indicate if they had exposure and the benchmark for evaluating the exposure. Figure 1 is provided to allow a comparison of the exposure and hedging techniques for each firm. For those firms that used derivatives a further two questions were used to address the types of derivative contracts they used, and the percentage of exposure that the firm typically hedged over one year. The results from these responses are shown in figures 2 and 3. Figure 4 and 5 provides details of the methods used to evaluate financial risks. The different types of risks and how they relate to figures 1 through 5 are discussed below.

11. An ANOVA test was conducted between firms that had a risk management plan and those that did not have a risk management plan and firms that used and did not use derivatives. The results are similar to those in table 4 and are not reported.

Table 4
Attitudes to Derivative Use From Respondents With and Without a Risk Management Plan

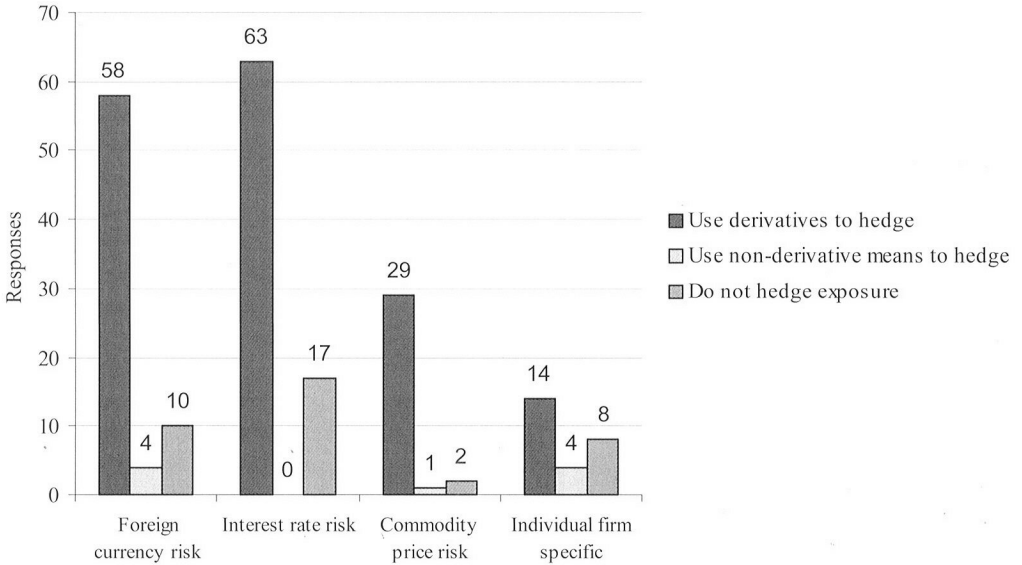
Issues	N ¹²		Mean		SD		t-Test	p-Value
	With a Plan	Without a Plan	With a Plan	Without a Plan	With a Plan	Without a Plan		
Change the volatility of accounting earnings	67	21	2.19	2.24	1.29	1.18	-0.139	0.890
Change the volatility of cash flows	68	21	2.24	1.95	1.33	1.32	0.854	0.395
Change balance sheet accounts or ratios	67	19	3.60	3.47	1.19	1.02	0.409	0.683
<i>Reduce taxation</i>	<i>68</i>	<i>18</i>	<i>4.29</i>	<i>3.78</i>	<i>0.93</i>	<i>1.22</i>	<i>1.957</i>	<i>0.054</i>
Reduce bankruptcy and financial distress	66	19	3.79	3.53	1.41	1.26	0.729	0.468
Reduce the use of debt finance	66	18	4.05	3.44	1.03	1.46	1.635	0.116
Increase the use of debt finance	66	19	4.06	3.79	1.04	1.18	0.974	0.333
<i>Reduce the cost of capital</i>	<i>67</i>	<i>19</i>	<i>2.94</i>	<i>3.58</i>	<i>1.24</i>	<i>1.22</i>	<i>-1.987</i>	<i>0.050</i>
Improve management/employee compensation	66	19	4.47	4.42	0.85	0.69	0.229	0.819
Improve value of the firm	68	21	2.32	2.67	1.24	1.15	-1.126	0.263
Budgeting purposes	68	20	3.10	3.15	1.15	1.27	-0.157	0.875
Reduce political risk/pressure	67	19	4.06	3.58	1.04	1.43	1.369	0.184
The firm has alternative means to manage financial risks	67	18	3.39	3.78	1.24	1.44	-1.143	0.257
There are difficulties pricing and valuing derivatives	67	19	4.07	4.11	1.03	1.05	-0.114	0.910
The disclosure requirements of accounting standards	68	19	4.04	4.11	1.01	1.10	-0.228	0.820
Legal restrictions on the use of derivatives	68	19	4.13	4.00	1.04	1.15	0.480	0.632
The necessary accounting treatment is too complex	66	19	4.20	4.05	1.08	1.13	0.507	0.614
The perceptions of derivatives use by investors, regulators and the public	67	19	3.85	3.74	1.09	1.41	0.326	0.747
Reduce risks faced by management	68	20	2.31	2.75	1.27	1.52	-1.303	0.196

4.3.1 Foreign Currency Risk Figure 1 shows that 72 of the sample of 100 firms surveyed indicate exposure to foreign currency risk. Of these 72 sample firms, 62 (86%) hedge the exposure. Approximately 14% of respondents did not hedge their

12. This number represents the number of usable responses on the particular issue. Respondents did not provide a response on all issues.

foreign currency exposure. This may have been because it was not sufficiently large to warrant hedging or they chose not to hedge for other reasons. Only 4 firms chose to hedge foreign currency exposure with non-derivative means (this could include balance sheet hedges or other offsetting transactions). Therefore, 58 firms out of 72 (80%) use derivatives to hedge foreign exchange exposure. Forward foreign exchange contracts are the most common types of derivatives used to manage the exposure although options and swaps are also very popular (fig. 2).

Figure 1
The Extent of Exposure and Hedging



Respondents that use derivatives were also requested to indicate the percentage of exposure the firm would typically hedge. The responses are shown in figure 3. Approximately 9% indicated that 100% of foreign exchange exposure would be hedged. Thirty-eight percent indicated they would hedge 76% to 99% of their exposure, 21% would hedge 51% to 75%, leaving approximately 33% hedging 50% or less of their exposure.

Figure 4 provides responses on methods used to evaluate foreign exchange risk management. With respect to the benchmark firms use to evaluate foreign currency risk management, 30% of the firms that indicated they are exposed did not use a benchmark, 30% use forward rates at the beginning of the period, 18% use spot rates at the beginning of the period, 19% use a baseline percent hedged strategy and 18% use other benchmarks such as budgeting and value at risk assessments.¹³

13. Ten firms selected more than one option.

Figure 2
Types of Derivatives Used to Manage Exposures

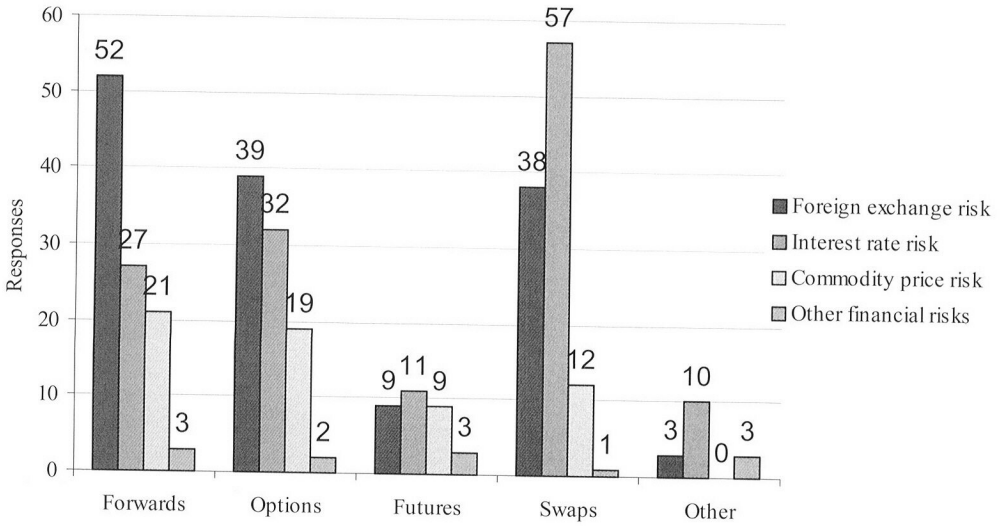


Figure 3
Annual Average Percentage Exposure Hedged with Derivatives

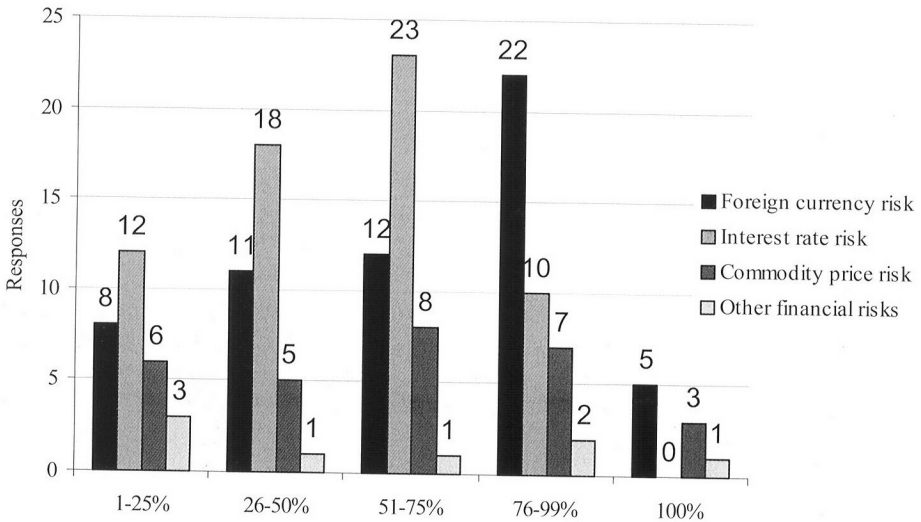


Figure 4
Responses on Methods Used to Evaluate Foreign Exchange Risk Management

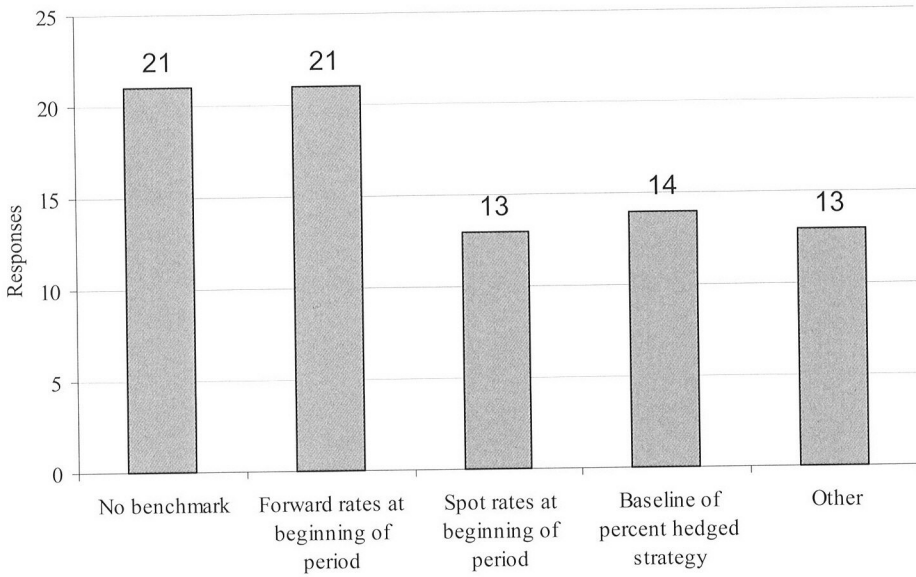
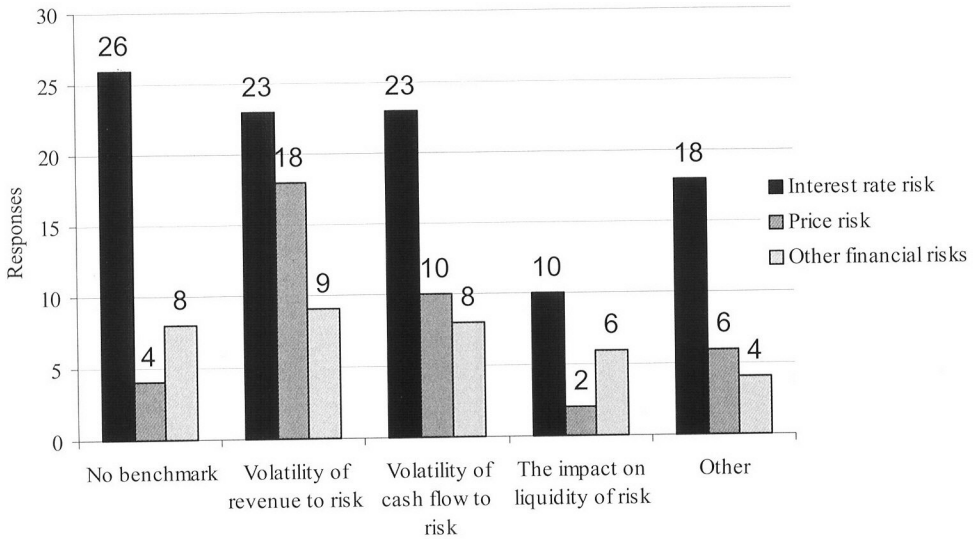


Figure 5
Responses on Methods Used to Evaluate Interest Rate, Commodity Price and Other Financial Risks



4.3.2 Interest Rate Risk Of the sample of 100 firms, 80 (80%) indicate that they are exposed to interest rate risk (fig. 1). Sixty-three (79%) of these firms use derivatives to hedge the interest rate risk and 17 (21%) do not hedge the exposure. No respondents use non-derivative means to hedge interest rate risk. The most preferred technique for hedging interest rate risk is interest rate swaps (fig. 2). Fifty-seven firms use swaps compared with 32 using options and 27 forwards.

The percentage of interest rate exposure that is on average hedged by derivative users throughout the year is shown in figure 3. No firms hedge 100% of their interest rate risk while 16% of firms hedge between 76% and 99% and 36% of firms hedge from 51% to 75%. Approximately, 47% of sample firms hedge 50% or less of their interest rate risk.

Figure 5 provides details of the methods used to evaluate interest rate risk management. Of the 80 firms responding, 26 (32%) did not use a benchmark for interest rate risk exposure. The volatility of revenue and the volatility of cash flows to interest rate exposure were the most common benchmarks with 23 firms (29%) using each of these methods.

4.3.3 Commodity Price and Other Individual Firm Specific Risks Thirty-two firms (32%) and 26 firms (26%) of the sample of 100 firms indicate exposure to commodity prices and other financial risks respectively (fig. 1). Interestingly, nearly all firms that indicate exposure to commodity price risk hedge the risk with derivatives. In the sample of 26 firms with other financial risks, over 50% hedge the risk with derivatives and 31% do not hedge the exposure. Forward and option contracts are the most common derivatives used to hedge commodity price risk, with 21 (80%) and 19 firms (73%) using forwards and options respectively (fig. 2). In regard to other financial risks, there is greater variation in the different types of derivatives used. This may reflect the lack of organised markets for forwards and options that exist to hedge other exposures.

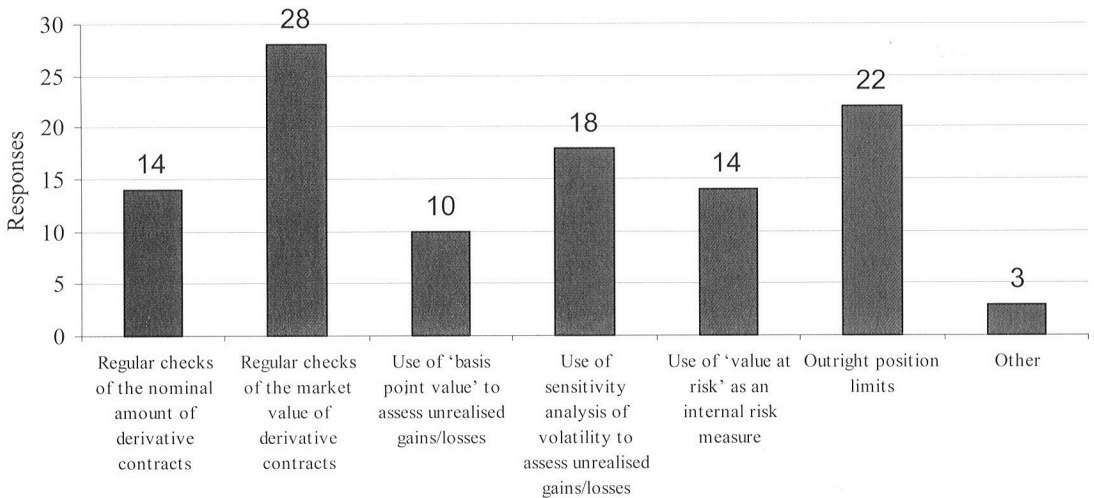
Of those firms indicating exposure to commodity price risk, the annual average percentage of the exposure hedged ranges from 1% to 100% with 38% of firms hedging less than 50% (fig. 3). It is interesting that even though only 29 firms indicate that they hedge commodity price risk with derivatives, the range of exposure that they hedge is broad from 1% to 100%. The most common benchmarks for evaluation of risk management of price and other financial risks are volatility measures on revenues and cash flows (fig. 5).

4.3.4 Summary The majority of companies indicate exposure to foreign exchange risk and interest rate risk. There are a variety of benchmarks used to evaluate the management of the exposures; however, a high proportion of firms do not use any benchmark. There is a high level of exposure unhedged. This result is similar to public sector organisations. Brailsford, Heaney and Oliver (2003) report that one half of public sector organisations leave their exposure more than 50% unhedged. It is potentially a concern to investors that financial exposure remains open. However, it is more likely that most investors are unaware of what exposures to financial risks firms face. There is some consistency in these results with Nguyen and Faff (2003) who find long-term exposure in their empirical analysis. Our results are also consistent with Guay and Kothari's (2003) conclusion that the derivatives portfolio is only a small proportion of overall exposure.

4.4 Techniques Used to Manage Derivative Risks

Figure 6 displays the techniques that are used to manage derivative risk. The most common technique is regular checking of the market value of derivative contracts. Other techniques used are outright position limits and the use of sensitivity analysis of volatility to assess unrealised gains and losses. Value at risk is used by only 18% of the sample firms. This result is consistent with Brailsford, Heaney and Oliver (2003) yet lower than that reported by Bodnar, Marston and Hayt (1998) with respect to U.S. organisations. Value at risk does not find the support in Australia that is found overseas.

Figure 6
Techniques Used to Manage Derivative Risks



5. Conclusion

This study takes a direct approach to determine management motivations for the use of financial derivatives. We survey a sample of firms on attitudes to derivative use and financial risk management. The sample ranges across seven industry sectors. We list a series of theoretical reasons for using derivatives, developed from the literature, and seek management’s views of the importance of these issues. The results show that derivatives are used for a range of different purposes, in a variety of different ways, over a broad range of risks and to cover a broad range of exposures. This helps explain why empirical results fail to show consistency in the determinants of derivative use. We isolate differences depending on derivative use and whether the firm has a risk management plan. However, considerable consistency in results occurs.

We find that managers are focused on the broad reduction of risk and volatility of cash flows and earnings in using derivatives. Specific issues such as reducing bankruptcy costs, debt levels and taxation are not considered as important as other issues. However, although broad generalisations regarding derivative use is



evident the broad range of issues and the broad range of responses on the importance of the issues suggests that derivative use is driven by complex agency relationships within each firm. This is particularly the case for users of derivatives indicating a practical limitation in implementing these concepts. The results are consistent with Guay and Kothari (2003). The issues of taxation and difficulties in pricing derivatives are significantly different in importance depending upon whether the firm uses derivatives and whether it has a risk management plan.

The main risks that are hedged are foreign currency and interest rate risks and derivatives are the favoured way to hedge these risks. Forward, options and swaps are the more common contracts that are used to hedge financial risks. This is also similar to the findings of previous studies.

Respondents also report that a large proportion of financial risk exposure is unhedged and a very small number of firms hedge all their financial risk exposure with derivatives. This is a very relevant finding for investors in organisations given that a high proportion of diversifiable risk is uncovered.

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References

- Berkman, H., Bradbury, M.E., Hancock, P. & Innes, C. 2002, 'Derivative financial instrument use in Australia', *Accounting and Finance*, vol. 42, no. 2, pp. 97-109.
- Bodnar, G., Marston, R. & Hayt, G. 1998, *1998 Survey of Financial Risk Management by U.S. Non-Financial Firms*, Weiss Centre for International Financial Research, The Wharton School.
- Brailsford, T., Heaney, R. & Oliver, B. 2003, 'Practices and attitudes to derivatives use in Australian Commonwealth organisations', *Australian Journal of Public Administration*, vol. 62, no. 2, pp. 87-100.
- Faff, R. & Marshall, A. 2002, 'The choice of foreign exchange hedging techniques: An international study', *Financial risk and financial risk management*, vol. 16, pp. 137-72.
- Froot, K., Scharfstein, D. & Stein, J. 1993, 'Risk management: Coordinating corporate investment and financing policies', *Journal of Finance*, vol. 48, pp. 1629-48.
- Geczy, C., Minton, B. & Schrand, C. 1997, 'Why firms use currency derivatives', *Journal of Finance*, vol. 52, no. 4, pp. 1323-54.
- Grant, K. & Marshall, A. 1997, 'Large U.K. companies and derivatives', *European Financial Management*, vol. 3, no. 2, pp. 191-208.
- Guay, W. & Kothari, S.P. 2003, 'How much do firms hedge with derivatives', *Journal of Financial Economics*, vol. 70, pp. 423-61.
- Lee, F.M., Marshall, A., Szto, Y.K. & Tang, J. 2001, 'The practice of financial risk management: An international comparison', *Thunderbird International Business Review*, vol. 43, no. 3, pp. 365-78.
- Marshall, A. 2000, 'Foreign exchange risk management in U.K., USA and Asian Pacific multinational companies', *Journal of Multinational Financial Management*, vol. 10, pp. 185-211.
- Modigliani, F. & Miller, M. 1958, 'The cost of capital, corporate finance, and the theory of investment', *American Economic Review*, vol. 48, pp. 261-97.

- Myers, S. 1977, 'The determinants of corporate borrowing', *Journal of Financial Economics*, vol. 5, pp. 147–75.
- Nance, D., Smith, C., Jr. & Smithson, C. 1993, 'On the determinants of corporate hedging', *Journal of Finance* vol. 48, no. 1, pp. 267–84.
- Nguyen, H. & Faff, R. 2002, 'On the determinants of derivative usage by Australian companies', *Australian Journal of Management*, vol. 27, no. 1, pp. 1–24.
- Nguyen, H. & Faff, R. 2003, 'Further evidence on the corporate use of derivatives in Australia: The case of foreign currency and interest rate instruments', *Australian Journal of Management*, vol. 28, no. 3, pp. 307–17.
- Smith, C. & Stulz, R. 1985, 'The determinants of firms' hedging policies', *Journal of Financial & Quantitative Analysis*, vol. 20, no. 4, pp. 391–406.
- Stulz, R. 1984, 'Optimal hedging policies', *Journal of Financial and Quantitative Analysis*, vol. 19, pp. 127–40.
- 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.