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FINANCIAL RISK MANAGEMENT IN COMMONWEALTH ORGANISATIONS

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Abstract

In the last decade financial risk management in public sector organisations has become of greater interest to the public, politicians and regulators. Derivatives are commonly used to manage financial risk but little is known about the reasons why financial risk is managed, particularly through the use of derivatives. Furthermore, little is known about the reasons for and extent of derivative use in public sector organisations. To the authors knowledge this paper represents one of the first studies into the use of derivatives in Australian Commonwealth public sector organisations.

A sample of Commonwealth organisations is surveyed on attitudes towards the use of derivatives for hedging. A variety of tests including ANOVA and t-tests are used to analyse the results. The two most important issues in the use of derivatives for hedging in the Commonwealth public sector include budgeting and reducing risks faced by management. Reducing the risks faced by management is often cited as a reason for derivative use in the private sector. It is unclear if budgeting is linked to this. Respondents from Commonwealth organisations rank other private sector reasons for derivative use, such as reducing bankruptcy and taxation relatively unimportant. Results also indicate that there are significant differences in the level of importance in some issues regarding derivative use across different organisations, particularly those with and without a documented risk management plan.

Keywords: Public sector; Derivatives; Risk management; Financial risk
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I. Introduction

The importance of financial risk management in the private and public sectors has increased over time. The reasons for the increase in importance are not clear. However, apparent increases in price volatility in financial markets and increases in the tools to manage financial risks are likely contributors. Also, media reports of losses incurred by companies when financial markets move adversely are also likely to put pressure on corporate managers to reduce financial risks. Managerial risk aversion may also be a contributing factor. The Australian Commonwealth public sector has not been immune to spill-over effects from the private sector in relation to financial risk management. Many Commonwealth organisations are subject to rules and regulations in an attempt to simulate contestable and competitive private sector market forces.¹

Furthermore, the Australian public sector is not immune from exposure to financial risk such as foreign exchange risk, interest rate risk and commodity price risk. The Australian National Audit Office (ANAO) recently completed a performance audit of foreign exchange risk management practices in four Commonwealth agencies. The ANAO concluded, “that the foreign exchange risk was not effectively and prudently managed by the audited agencies” (ANAO 2000, p.13). The audited agencies suffered losses through adverse movements in foreign exchange. It would have been interesting if a similar conclusion would have been drawn if the exchange rate had moved in a favourable direction over the period of the audit and gains made rather than losses incurred. No mention was made in the audit as to how financial risk was to be effectively and prudently managed.

Derivative financial contracts are commonly used in the management of financial risk, particularly as a hedging vehicle. Although a number of reasons have been documented in the literature for hedging (through use of derivatives), a model of hedging behaviour has not been developed either for public or private sector organisations.

The purpose of this paper is to document the extent of and attitudes towards derivatives use for financial risk management in a sample of Australian Commonwealth public sector organisations. It represents the first published study into derivative use in Commonwealth public sector organisations.

The paper is organised as follows. Section two provides a brief summary of the reasons cited for hedging financial risks in the private sector and possible motives for derivative use in the public sector. Also recent evidence into the use of derivatives is presented in this section. Section three documents the data and section four details the results. Section five concludes the paper.

¹ For example the Commonwealth GBE (Government Business Enterprise) Arrangements.

2 The reasons for hedging and recent evidence of derivative use

2.1 Private Sector

In the private sector, the Modigliani and Miller (1958) irrelevance result applies to corporate hedging under conditions of perfect competition. Why should the market value corporate hedging if investors can hedge at the same cost? It has often been argued that explanations for corporate hedging can be found in situations where Modigliani and Miller irrelevance does not hold, that is, where the market is imperfect. For example, analytical models suggest that the existence of agency costs, costly financial distress, convex tax schedules and information asymmetry may explain corporate hedging behaviour.

Hedging can reduce the level of agency costs by reducing the possibility of under-investment and over-investment problems (Titman, 1985; Bessembinder, 1991 and Smith, Smithson and Wilford, 1990). Where a firm holds debt it is possible that management acting in the interests of shareholders will ignore a positive net present value project, as the benefits of the project may accrue entirely to the debtholders. Further, with a levered firm it is also possible that a negative net present value project will be preferred by shareholders where there is a small probability of extreme positive payoffs, most of which would accrue to the shareholders. An appropriately designed hedging policy can remove the incentive for these forms of wealth transfer.

Hedging can also reduce the costs of financial distress (Titman, 1985). If hedging is applied to reduce the volatility of earnings, the probability of default is reduced and so the expected cost of financial distress is reduced and firm value is increased.

The existence of a convex tax schedule suggests that after-tax firm value is concave in pre-tax value (Smith and Stulz, 1985). For example, a firm will maximise value if losses can be minimised or investment tax credits can be maximised. With tax losses the ultimate tax benefit arising from tax losses is not immediately available whereas the costs from tax on profits is payable now. Thus, if tax losses can be avoided or reduced or the benefits of investment tax credits maximised by careful hedging then the present value of corporate cash flows is increased resulting in increased firm value (Smith and Stulz, 1985).

Much of the private sector literature argues that hedging increases the value of a firm where it is assumed that management act to maximise firm value. Stulz (1984) and Smith and Stulz (1985) focus on managerial risk aversion as a reason for hedging. Managers whose human capital and wealth are poorly diversified prefer to reduce the risk to which they are exposed. Evidence supporting this is shown in Tufano (1996). This argument is similar to the arguments concerning managers adopting a less than optimal firm capital structure to reduce their individual risks (Friend and Lang 1988).

Strangely, little evidence has been documented to support the tax effect (except in the case of tax credits), agency cost or financial distress cost explanations for derivatives use (Mian 1996 and Nance, Smith and Smithson 1993). Reasons for this lack of empirical support may be that many of the theoretical explanations are likely to only become relevant when debt levels are high. For example if the risk of bankruptcy is small then the benefit from using derivatives to reduce bankruptcy is also likely to be small. Tufano (1996) reports evidence from the gold mining industry that indicates

that risk management practices appear to be driven more by managerial risk aversion than shareholder value maximisation.

2.1 Public Sector

If risk management, through the use of derivatives, is costly (in terms of transaction costs and resources devoted to treasury functions in the organisation) and the purpose of the derivatives is for managerial risk aversion and not the maximisation of shareholder value, then the use of derivatives in public sector organisations may have considerable resource implications. To complicate matters further, ANAO 2000 reports that legal advice given to the ANAO confirms the responsibility of officials in each agency to manage such risks, particularly under the provisions of the *Financial Management and Accountability Act 1997*(p. 9). The legislation may be inadvertently forcing organisations into risk management practices that benefit the managers rather than the government and the public.

The extent of derivative use in the Commonwealth public sector is unknown. Furthermore, if public sector organisations are using derivatives, it is unknown why they are using them. Many of the reasons for derivative use that has been suggested in the literature relate to private sector organisations. Many of these are unlikely to be relevant to organisations in the public sector. For instance the use of derivatives to reduce bankruptcy is unlikely to be an issue in public sector organisations due to the implicit government guarantee afforded to these organisations.² Taxation is also unlikely to be an issue for public sector organisations due to the lack of tax liability these organisations face. Agency issues are related to debt. Many public sector organisations are likely to be debt-free and therefore this issue is also unlikely to be a determining factor in derivative use.

Differences in attitudes toward risk between managers of public and private sector organisations are not known. However, if derivative use is costless then allowing managers to reduce risk using corporate risk management practices is innocuous, and differences among organisation's risks management policies are unimportant. However, if risk management is costly, then one must ensure that organisation resources are devoted to value maximisation and not manager risk reduction (Tufano 1996).

Generally, there is little evidence on the extent of derivative use by firms, either in the public or private sector. This is particularly so in Australia as until recently, disclosure of derivative use in annual reports was not required by accounting standards. This made it difficult to obtain information from annual reports regarding derivative use unless firms voluntarily disclosed the information. Difficulty in obtaining information on derivative use is similar in the U.S.A. and Europe (De Ceuster, Durinck, Lavern and Lodewyckx, 2000). Furthermore, information from annual reports is often limited in scope. Therefore, the evidence of derivative use is mostly obtained through

² It is extremely unlikely that a Commonwealth organisation would be allowed by a government to be bankrupt with losses to creditors and other stakeholders. In cases where a public sector organisation becomes technically bankrupt, the government can allocate the necessary funds from the Budget.

surveys, and recent surveys have concentrated on private sector firms. Surveys by Bodnar, Marston and Hayt (1998), Bodnar and Gebhardt (1998) focus on publicly listed firms in the U.S.A. and Germany, respectively. A survey by Heaney, Koga, Oliver and Tran (1999) considers the use of derivatives by firms in Japan and a survey by Grant and Marshall (1997) considers the use of derivatives by large U.K. firms.

Some of the key findings from these surveys are that exposures that are commonly hedged include foreign exchange and interest rate risk and the major types of derivative contracts used to hedge these risks are forward foreign exchange contracts and interest rate swaps. There is also a general tendency to hedge less than 100% of the total foreign exchange exposure. Furthermore, the majority of hedges have a relatively short maturity. However, these surveys provide little evidence on reasons why derivatives are used for hedging.

There is very little published literature on the use of derivatives by either private or public sector organisations in Australia. Little is known about the extent and use of derivatives in these organisations.

3 Data

The Commonwealth government consists of approximately eighteen portfolios. Within each portfolio there are numerous Commonwealth companies and statutory authorities. The Commonwealth consolidated financial statements provide a comprehensive list of Commonwealth controlled entities. This includes Departments of State and companies and authorities of the Commonwealth.

From the Commonwealth Consolidated Annual Report for 1999, 160 organisations were identified (not including Commonwealth Departments). This number was reduced to 136 as a result of reorganisation within the Commonwealth public sector.³ The 1998 annual reports were obtained for each organisation and inspected for details of any evidence of derivative disclosure or activity. Of the 136 organisations, 14 (10%) were initially identified through the annual reports as derivative users. This represents a considerably smaller proportion of derivative users than that reported in studies on private sector organisations.⁴

³ These 24 organisations were absorbed back into Departments, wound up or sold since 1999.

⁴ Bodnar, Marston and Hayt (1998) survey approximately 400 U.S.A. firms on a range of issues relating to derivative use. Approximately 50% of firms indicate that they use derivatives. Heaney, Koga, Oliver and Tran (1999) find 60% of their sample of 302 Japanese firms use derivatives and Bodnar and Gebhardt (1998) find approximately 80% of their sample of 126 large listed and non-listed German firms use derivatives. Grant and Marshall (1997) find approximately 90% of the firms in their sample of 55 large U.K. firms use derivatives.

Two survey instruments were developed. One instrument was for organisations that were identified as being derivative users and consisted of 24 questions.⁵ The other was for non-derivative users and consisted of 11 questions.⁶ Two instruments were required to capture the different issues relating to derivative use that would not necessarily be relevant to both derivative users and non-derivative users. The instruments were posted in February 2000 addressed to the Chief Executive Officer or Chief Finance Officer of each organisation in the sample with a self-addressed return envelope. Telephone conversations with a sample of organisations as well as letters included with responses indicated that CEOs or CFOs completed the questionnaires.

4 Results

Eighty organisations responded to the surveys. This represents an overall response rate of more than 58%. The response rate is divided between derivative non-users and derivative users, 67 (55%) and 13 (93%) respectively.^{7,8}

The main common question in each questionnaire asked respondents to classify, on a 5-point Likert scale, the level of importance of a series of issues relating to the use of derivatives for hedging (1 being most important and 5 being least important). The issue/reason for derivative use for hedging, the number of usable responses, mean, standard deviation, rank (based on mean score) and the number of responses for each level of importance for the total sample of responses are shown in Table 1.

[Please insert Table 1 about here].

⁵ For each organisation the annual reports were inspected for any information regarding the use of derivatives. If there was any mention that derivatives were used, then these organisations were classified as derivative users.

⁶ The cover letter to these organisations provided a mechanism whereby if the organisation was incorrectly classified as a derivative user or non-derivative user, the respondent could return the questionnaire for the alternative. There was only one organisation that returned a questionnaire for replacement.

⁷ A response was not obtained from one organisation that was partly privatised and used derivatives. Due to the small sample size of derivative users, follow-up action was undertaken. Originally only seven responses were obtained from derivative users, a further six were obtained through telephone contact with the organisations. Not all respondents provided answers to all questions.

⁸ Non-response bias from organisations that use derivatives was not considered due to the high response rate. However responses from non-users were sorted according to the date they were received and t-tests on the mean scores for the first 10 (20) and last 10 (20) responses received could not reject the null of equal means.

There are approximately 63 usable responses for each issue. The issue most important (based on mean score) regarding the use of derivatives for hedging is for budgeting purposes (lowest mean score=2.92). The use of derivatives for budgeting allows managers to more accurately estimate the necessary funds required to carry out the activities of the organisation. This reason is supported by the third most important issue being to change the volatility of cash flows. Although not specifically stated it is expected that respondents have interpreted this as a reduction not an increase in volatility as reducing the volatility in cash flows would also help in budgeting. The fundamental reason why budgeting and volatility are important issues in derivative use can be gauged from the second most important issue.

The second most important issue for the use of derivatives for hedging is to reduce the risks faced by management (mean score=3.05). This supports the claim by Tufano (1996) that managerial risk aversion is an important factor of risk management policy. Interestingly, the use of derivatives to improve management compensation is ranked low in importance (mean score=4.3). A possible explanation for this is the lack of management compensation packages that are explicitly linked to the financial performance of the organisation.⁹ Tufano (1996) reports that firms in the U.S. gold mining industry have different risk management practices depending upon different ways in which managerial compensation packages are linked to firm value or performance.

The issue that is considered least important based on mean scores is the use of derivatives to reduce taxation (mean score=4.52). Altering the level of debt is also ranked relatively low in importance, as is reducing bankruptcy and financial distress. The use of derivatives to reduce taxation, alter capital structure or reduce bankruptcy and financial distress are traditional reasons for the use of derivatives in the private sector (Mian 1996 and Smith, Smithson and Wilford 1990). Respondents from public sector organisations in the sample do not appear to consider the use of derivatives for altering taxation or capital structure, as the traditional reason cited in the literature would suggest. However, whether Australian private sector firms have similar views is an area for future research.

The sample comprises both organisations that use and do not use derivatives, and the issues associated with derivative use may differ across these two different groups. To ascertain whether there is any difference in responses the sample was divided according to whether the organisation is a derivative user or not. Table 2 provides the mean scores and standard deviations from responses for derivative users and non-derivative users on issues relating to derivative use for hedging. The final column of Table 2 documents the results of a t-test on differences in means.¹⁰

⁹ An inspection of the annual reports for each organisation failed to identify any managerial salaries explicitly linked to organisation financial performance, such as profits or earnings.

¹⁰ For all t-tests reported in this paper the Levene's test for equality of variance is first conducted to determine which t-test is appropriate. Also, a non-parametric Kruskal-Wallis test is undertaken to

[Please insert Table 2 about here].

For derivative users (column 2 and 3 of Table 2) the three most important issues regarding the use of derivatives for hedging are for budgeting purposes (mean score=2.18), improving the value of the organisation (mean score=2.64) and reducing political risk/pressure (mean score=2.73). The three least important issues for derivative users are increasing the use of debt finance (mean score=4.73), reducing taxation (mean score=4.64) and reducing the use of debt finance (mean score=4.36).

For non-derivative users (column 4 and 5 of Table 2) the three most important issues regarding the use of derivatives for hedging are budgeting purposes (mean score=3.08), reducing risks faced by management (mean score=3.08) and changing the volatility of cash flows (mean score=3.13). The three least important issues are reducing taxation (mean score=4.50), reducing the use of debt finance (mean score=4.44) and increasing the use of debt finance (mean score=4.41).

The first issue of interest from Table 2 is that for derivative users the use of derivatives to reduce the risks faced by management is ranked 6th most important while for non-derivative users it is ranked 3rd most important. However, t-test results show no significant difference between the mean scores (Column 6 of Table 2).

There are only two issues where the t-tests indicate a significant difference between mean responses from users and non-users in relation to the use of derivatives for hedging. Derivative users consider derivatives to be more important for both improving the value of the organisation and for budgeting purposes than do non-derivative users. It is unclear how managers of public sector organisations value these organisations, given that there is no market for the securities and assets are likely to be difficult to value.

Documented financial risk management plans are an important aspect of risk management for any organisation.¹¹ The questionnaire asked respondents (non-users) whether their organisation had a risk management plan. Of the 67 responses from non-derivative users, less than 1/3rd (only 21 responses) indicated that their organisation had a documented risk management plan. 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. All derivative users had a risk management plan. A comparison of the responses from derivative users and non-derivative users with and without a risk management plan is reported in Table 3. The first column of Table 3 is the issue considered by respondents, the next six columns provide the means and standard deviations of responses for the three sub-groups. The eighth column of Table 3 provides the results of an ANOVA test for the joint difference between the three groups. The ninth column provides the results of a t-test of differences in means

provide further support for the t-test results. In all cases the Kruskal-Wallis test leads to similar conclusions to the t-test results and are not reported.

¹¹ See Australian Standard AS/NZS 4360:1995 and MAB/MIAC Report 22.

between derivative users and non-users with a risk management plan, while the tenth column provides the results of a t-test between users and non-users without a risk management plan. The final column of Table 3 provides the results of a t-test for the difference in means between non-derivative users with and without a risk management plan.¹²

[Please insert Table 3 about here].

From Table 3, the ANOVA results indicate a significant difference between the three groups on two issues: the use of derivatives for budgeting and for improving the value of the organisation. The t-tests reveal that there is no significant difference in means for any issue between users and non-users with a risk management plan. In relation to users and non-users without a risk management plan the two issues of budgeting and improving the value of the organisation are significantly different.

Based on differences in mean scores for non-derivative users, respondents in organisations that have a risk management plan consider derivatives for hedging to improve the value of the organisation significantly more important than respondents in organisations that do not have a risk management plan (mean score=2.80 v 3.69 from Table 3). Similarly, respondents in organisations with a risk management plan consider the use of derivatives for budgeting purposes as significantly more important than respondents in organisations without a plan (mean score=2.40 v 3.36 from Table 3).

The result in Table 3 imply that differences in the level of importance of derivatives for budgeting and improving the value of the organisation are determined by whether the organisation has a documented risk management plan, irrespective of whether the organisation uses derivatives or not. It is unknown whether this difference is due to a difference in knowledge regarding the use of derivatives and financial risk management. However, as mentioned earlier, a reason for these statistically significant differences could be that organisations with a risk management plan have considered in more detail the use of derivatives than those organisations without a risk management plan. Organisations with a risk management plan recognise the greater importance of derivatives for improving the value of the organisation and for budgeting purposes.

Although tests of differences in mean scores reveal significant differences on two issues, the ranking of the issues may provide more insight into the reasons for derivative use. Table 4 provides details of rankings of each issue based on mean scores and differences in rankings across responses from derivative users and non-derivative users (which are then divided into organisations with and without a documented risk management plan). The last three columns of Table 4 show the differences in rankings on each issue across the non-derivative users, non-users with a risk management plan and non-users without a risk management plan. The last two

¹² The Tukey HSD test was also performed on the three groups with similar results. These results are not reported.

columns of Table 4 are of most interest. These columns highlight three interesting issues. First, there is similarity between rankings by users and non-users with a documented risk management plan on all issues except the use of derivatives to reduce the risks faced by management. Non-users of derivatives rank the use of derivatives to reduce the risks faced by management as the 2nd most important reason while derivative users rank it as 6th most important. This difference in ranking does not change much irrespective of whether the organisation has a documented risk management plan or not.

[Please insert Table 4 about here].

This result is unusual given that a reason cited in the literature for the use of derivatives is to reduce managerial risks. The organisations that do not use derivatives recognise this but those that use derivatives do not explicitly recognise it. A possible reason is that organisations that use derivatives may not wish to admit that derivatives are being used in their organisation for managerial purposes.

Second, there is a considerable difference in rankings between users and non-users without a documented risk management plan on the two issues identified in previous tests, namely, the use of derivatives for improving the value of the organisation and the use of derivatives for budgeting purposes.

The third issue of interest is the difference in rankings on the use of derivatives to change the volatility of cash flows. Organisations that use derivatives as well as organisations that do not use derivatives but have a risk management plan rank this issues 4th or 5th, respectively. Organisations that do not have a risk management plan rank this issue as the most important. It is unclear why this difference exists.

In relation to exposures that are hedged by the organisations that use derivatives, six hedge both interest rate and foreign exchange rate risks and a further five hedge only foreign exchange rate risk. Foreign exchange and interest rate risks are the two most common risks that are hedged with derivatives in the private sector. The different types of derivative contracts that are used to hedge these risks are shown in Table 5.

[Please insert Table 5 about here].

Columns two and three of Table 5 show that the types of derivative contracts used for hedging range across the normal 'vanilla' contracts: options, forwards, futures and swaps. All except one respondent organisation uses forward foreign exchange contracts for hedging foreign exchange risk and nearly 50% of respondents also indicate that foreign exchange options are used. Only a small number use foreign currency swaps and only one uses foreign currency futures. In regard to interest rate risk there is a relatively even spread of use across options, forwards, futures and swaps. These results are similar to other studies on derivative use, although overseas studies have reported using considerably more exotic instruments. This suggests that Commonwealth public sector organisations choose not to use the more complex instruments for risk management.

Of interest is the percentage of foreign exchange and interest rate exposures that are hedged. Respondents were asked to identify the annual average percentage of

exposure hedged. For example if an organisation had a foreign exchange exposure it may choose to hedge less than 100% of the exposure. If this is the case then it indicates that they may be speculating to some extent on movements in foreign currency. These results are shown in Table 6. The first column in Table 6 shows the annual percentages of exposures that are hedged. Columns two and three provide the responses for the ranges of foreign exchange and interest rate risks that are hedged. Three organisations (25% of responses) hedge 100% of foreign exchange exposures and only one organisation hedges 100% of interest rate risk. These results are not inconsistent with results from surveys of private sector organisations overseas.

In regard to the management of risk only 23% of organisations indicate that they use Value-at-Risk (VAR). This is considerably lower than Bodnar, Marston and Hayt (1998) who report that 44% of respondents from private sector organisation in the U.S. use VAR. Heaney, Koga and Oliver (1999) find only 3% of respondents from private sector organisations in Japan use VAR.

5 Conclusion

In the last decade financial risk management in public sector organisations has become of greater interest to the public, politicians and regulators. Although the reasons for this greater interest in the financial management of public sector organisations are unknown it has resulted in greater financial accountability for these organisations. However, the greater accountability has not resulted in the Australian Commonwealth public sector being immune to poor financial risk management.

Derivatives are commonly used to manage financial risk but little is known about the reasons why financial risk is managed, particularly through the use of derivatives. Furthermore, little is known about the reasons for and extent of use of derivatives in Commonwealth organisations. This paper represents one of the first studies into issues that attempt to describe the use of derivatives for hedging in public sector organisations.

A survey instrument was used to obtain views on the importance of issues associated with the use of derivatives for hedging financial risk in a sample of Commonwealth organisations. A considerably smaller proportion of Commonwealth public sector organisations in the sample use derivatives relative to firms in the private sector (based on studies using overseas data). In addition the responses indicate considerable inconsistency on the issues determining derivative use for hedging relative to the research on derivative use in the private sector. This is not surprising given the different organisational structures between public and private sectors.

Issues that are important regarding derivative use in Commonwealth organisations include budgeting, reducing risks faced by management and changing the volatility of cash flows. Reducing the risks faced by management is regarded as a traditional reason for derivative use in the private sector. It is unclear whether the other reasons are also linked to managerial risk aversion. However, there are also inconsistencies within Commonwealth organisations on the reasons for derivative use, which become evident when the sample of organisations is divided into those with and without a documented risk management plan. Approximately half of the organisations in the

sample have a risk management plan. Specifically, organisations with a risk management plan (irrespective of whether the organisation uses derivatives) regard the use of derivatives for improving the value of the organisation and for budgeting as significantly more important than organisations without a risk management plan.

Furthermore, responses from organisations that use derivatives indicate that these organisations do not consider derivatives as being relatively important for reducing the risks faced by management whereas non-derivative users consider this issue relatively important. It is unclear why derivative users would state that this issue is relatively less important given that it is a traditional reason for derivative use but non-derivative users recognise it as an important issue.

Further research is required. It is necessary to understand derivative use in these organisations so that appropriate risk management policy can be implemented. It is also necessary to identify those organisations that are using derivatives for hedging purposes are improving the value of the organisation.

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Table 1: Summary of responses in relation to derivative use from both non-derivative users and derivative users (ranked on mean response).

Both users and non-users of derivatives were asked to rank the following issues on level of importance in relation to the use of derivatives for hedging:

Issue:	N	Mean	Std. Dev.	Rank	Number of responses				
					Most important	<---->	Least important	1	2
Budgeting purposes	63	2.92	1.43	1	14	10	20	5	14
Reduce risks faced by management	61	3.00	1.48	2	14	11	14	9	15
Change the volatility of cash flows	65	3.06	1.52	3	12	17	10	7	19
Reduce political risk/pressure	63	3.14	1.37	4	9	12	18	9	15
Improve value of the organisation	62	3.24	1.38	5	7	13	20	4	19
Change the volatility of accounting earnings	64	3.31	1.46	6	10	9	17	7	21
Reduce the cost of capital	63	3.91	1.20	7	2	7	16	9	30
Change balance sheet accounts or ratios	64	4.02	1.18	8	3	4	13	13	31
Reduce bankruptcy and financial distress	64	4.19	1.26	9	3	6	9	4	42
Improve management/employee compensation	63	4.37	0.87	10	0	2	10	14	37
Reduce the use of debt finance	63	4.43	1.06	11	2	2	9	4	46
Increase the use of debt finance	62	4.48	0.97	12	1	2	9	4	46
Reduce taxation	62	4.53	1.05	13	2	3	5	2	50

Table 2: Comparison of Issues Relating to Derivative Use From Users and Non-Users of Derivatives

Issue	Users N» 13		Non-Users N» 50		t-test
	Mean	Std. Dev.	Mean	Std. Dev.	t
a. Change the volatility of accounting earning	2.91	1.70	3.40	1.41	1.00
b. Change the volatility of cash flows	2.83	1.64	3.11	1.50	0.57
c. Change balance sheet accounts or ratios	4.27	0.90	3.96	1.22	0.80
d. Reduce taxation	4.64	0.81	4.51	1.10	0.39
e. Reduce bankruptcy and financial distress	3.73	1.42	4.28	1.21	1.34
f. Reduce the use of debt finance	4.36	1.29	4.44	1.02	0.22
g. Increase the use of debt finance	4.73	0.65	4.43	1.02	1.22 ⁽¹⁾
h. Reduce the cost of capital	3.91	1.14	3.91	1.23	0.00
i. Improve management/employee compensation	4.60	0.84	4.32	0.87	0.93
j. Improve value of the organisation	2.50	1.45	3.41	1.31	2.12*
k. Budgeting purposes	2.18	1.60	3.08	1.36	1.92**
l. Reduce political risk/pressure	3.09	1.51	3.15	1.35	0.14
m. Reduce risks faced by management	2.58	1.56	3.10	1.46	1.08

⁽¹⁾ For these cases the Levene's test for equality of variance is rejected and the t-statistic assuming unequal variances is reported.

** Denotes significance at 10% (two-tailed).

* Denotes significance at 5% (two-tailed).

Table 3: Comparison of mean scores for responses from derivative users and non-derivative users with and without a risk management plan on issues associated with derivative use for hedging.

Issue	Group 3: Users (N» 11)		Group 1: Non-users with a risk management plan. (N» 17)		Group 2: Non-users with no risk management plan. (N» 36)		ANOVA ⁽²⁾	t-test Group 1 V Group 3	t-test Group 2 V Group 3	t-test Group 1 V Group 2
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	F	t	t	t
a. Change the volatility of accounting earning	2.91	1.70	3.11	1.57	3.54	1.31	1.03	0.32	1.30	1.06
b. Change the volatility of cash flows	2.83	1.64	3.11	1.45	3.11	1.55	0.16	0.49	0.53	0.00
c. Change balance sheet accounts or ratios	4.27	0.90	3.94	1.39	3.97	1.15	0.31	0.77	0.79	0.08
d. Reduce taxation	4.64	0.81	4.50	1.10	4.51	1.12	0.07	0.35	0.33	0.04
e. Reduce bankruptcy and financial distress	3.73	1.42	4.17	1.29	4.34	1.19	1.00	0.85	1.43	0.50
f. Reduce the use of debt finance	4.36	1.29	4.47	0.94	4.43	1.07	0.03	0.25	0.17	0.14
g. Increase the use of debt finance	4.73	0.65	4.29	1.10	4.50	0.99	0.67	1.30 ⁽¹⁾	0.70	0.67
h. Reduce the cost of capital	3.91	1.14	3.72	1.27	4.00	1.21	0.31	0.40	0.22	0.78
i. Improve management/employee compensation	4.60	0.84	4.22	1.00	4.37	0.81	0.61	1.00	0.78	0.59
j. Improve value of the organisation	2.50	1.45	2.76	1.20	3.74	1.26	5.70*	0.54	2.81*	2.69*
k. Budgeting purposes	2.18	1.60	2.53	1.23	3.34	1.35	3.99*	0.65	2.32*	2.09*
l. Reduce political risk/pressure	3.09	1.51	2.82	1.29	3.31	1.37	0.74	0.50	0.46	1.23
m. Reduce risks faced by management	2.58	1.56	2.76	1.44	3.26	1.46	1.24	1.32	1.36	1.15

(1) For these cases the Levene's test for equality of variance is rejected and the t-test assuming unequal variances is reported.

(2) The ANOVA tests for the difference between three groups: derivative users, non-derivative users with a documented risk management plan and non-derivative users without a documented risk management plan.

* Denotes significance at 5% (two-tailed).

Table 4: Differences in ranking of issues based on mean scores.

Issue	Rank of Issue			Difference in ranks			
	Users	Non-derivative Users			Users v Non-Users: All	Users v Non-Users: With Plan	Users v Non-Users: No Plan
		All	With Plan	No Plan			
a. Change the volatility of accounting earning	5	6	6	5	1	1	0
b. Change the volatility of cash flows	4	3	5	1	1	1	3
c. Change balance sheet accounts or ratios	9	8	8	7	1	1	2
d. Reduce taxation	12	13	12	13	1	0	1
e. Reduce bankruptcy and financial distress	7	9	9	9	2	2	2
f. Reduce the use of debt finance	11	12	13	11	1	2	0
g. Increase the use of debt finance	13	11	11	12	2	2	1
h. Reduce the cost of capital	8	7	7	8	1	1	1
i. Improve management/employee compensation	10	10	10	10	0	0	0
j. Improve value of the organisation	2	5	2	6	3	0	4
k. Budgeting purposes	1	1	1	4	0	0	3
l. Reduce political risk/pressure	3	4	4	3	1	1	0
m. Reduce risks faced by management	6	2	3	2	4	3	4

Table 5: The different contracts used to manage financial risk by users of derivatives

Types of contracts used to manage exposure	Foreign Exchange risk	Interest rate risk
Options	5	3
Forwards	12	2
Futures	1	2
Swaps	3	4

Table 6: Annual Average Percentage of Foreign Exchange Exposure and Interest Rate Exposure Hedged

Annual average percentage of exposure hedged	Foreign exchange risk	Interest rate risk
a. 0%	0	0
b. 1-25%	3	1
c. 26-50%	3	1
d. 51-75%	2	2
e. 76-99%	1	0
f. 100%	3	1