

Derivatives – the how and why for super funds

*Comparatively little is known about the analytical techniques and use of derivatives by Australian investment fund managers. A survey by **Kate Harris and Bruce Rosser** of 38 pooled superannuation funds managed by 19 different managers shows that the Australian funds remain wedded to the techniques of fundamental analysis in equities management. However, the use of derivatives, especially by the larger funds, is higher than that reported for the United States. The larger funds use derivatives (mainly options) primarily to enhance liquidity, whereas smaller funds appear to use them to enhance fund value.*



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Despite the significance of investment in Australian superannuation funds,¹ little is known about the analytical techniques used in the funds' investment (and disinvestment) decisions, and the extent to which they use derivatives-based techniques. The *Australian Super Review* (June 1990) reports a survey highlighting differences in fund managers' approaches to investment decisions, but does not throw light on the extent to which different analytical techniques and investment strategies are used by fund managers.

This study extends the evidence to cover a sample of Australian pooled superannuation funds. The results are compared with the known characteristics of similar funds in the US.

No attempt has been made to attribute differences between funds' performances to their use of derivatives-based strategies. Derivatives-based techniques are of special interest because of their potential for altering the risk profile of portfolios (often to hedge risks) and for enhancing liquidity where the underlying physical market is illiquid.

Derivatives (mainly options and futures) also allow "gearing-up", and increase flexibility in both asset-allocation and stock-selection decisions.

Recent US evidence

Carter and Van Auken (1990)² surveyed fund management techniques in four sectors: insurance, investment banks, bank trust departments, and investment advisers. Fundamental analysis was most frequently used (by 74 per cent of respondents), followed by technical analysis (35 per cent) and portfolio analysis (30 per cent), with derivatives contracting the least used (24 per cent for options and 19 per cent for futures).

Larger firms were more likely to employ these techniques, except for technical analysis. This is consistent with the argument that larger investment organisations should experience economies of scale and scope through increased specialisation of investment functions.

Evidence on the effect of the stockmarket crash of 1987 is mixed. Carter and Van Auken (1990) report that the crash did not significantly affect investment managers' use and evaluation of security analysis and portfolio management techniques, but Block and Gallagher (1988)³ report a decline in the use of derivatives by bank trust departments from 11.3 per cent before the crash to 6 per cent immediately after.

Again, larger funds were higher users of derivatives, mainly for portfolio insurance.

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Sample and research design

Pooled superannuation funds with returns listed in *Business Review Weekly* (April 1992) or in the Towers, Perrin, Forster and Crosby Inc. (TPF&C) survey of pooled superannuation funds (January 1992) were interviewed. A questionnaire was sent in July 1992 to 28 management companies asking respondents to select fund size, age and volatility classifications as well as methods of analysis and investment strategies.

Investment strategies can differ between funds under the same management because of different asset allocation and risk profiles, so managers were asked to complete a questionnaire for each of the pooled superannuation funds they managed. Nineteen responded, giving a coverage of 38 funds. Table 1 shows distributions on (Panel A) fund size, (Panel B) years of operation and (Panel C) volatility of returns.

Results

Equities management analytical techniques

Scores for the various techniques identified in Table 2 were obtained using a scale ranging from 1 (not used) to 5 (used a great deal). It is clear that fundamental analysis is more widespread than both technical analysis and portfolio analysis, as reported by Carter and Van Auken (1990) but, contrary to the latter's support for P/E analysis, top-down forecasting is dominant.

Derivatives

Round-trip trading in "physical" equities can incur significant transactions costs, whereas options and futures contracts have low start-up costs; both futures and options can create increased risk exposure for the same dollar outlay on the underlying security. Derivatives can therefore enhance portfolio liquidity, facilitate portfolio rebalancing and take advantage of arbitrage opportunities because large positions can be established quickly without reference to supply-and-demand conditions in the underlying security's market.

Pooled funds in Australia were found to be making substantial use of derivative-based products and techniques, with 85 per cent of funds using options and 82 per cent using futures. Both figures are markedly higher than

Table 1: Size, years of operation and volatility of sampled funds

Panel A		
Size of fund*	No. of funds	%
>1000	2	5.3
500-999	4	10.5
100-499	11	28.9
50-99	6	15.8
<50	15	39.5
	38	100
* \$m of assets managed		

Panel B		
Years of operation	No. of funds	%
>20	3	7.9
10-20	5	13.2
5-9	20	52.6
2-4	8	21.1
<2	2	5.3
	38	100

Panel C		
Volatility	No. of funds	%
High	3	7.9
Medium	9	23.7
Low-medium	11	28.9
Low	5	13.2
Capital stable	10	26.3
	38	100

percentages reported for four financial sectors in the United States by Carter and Van Auken (1990), for bank trust departments surveyed by Block and Gallagher (1988) and for non-trust money managers surveyed by Block and Gallagher (1990)⁴.

Which derivatives?

Table 3 shows the relative frequencies of standard derivative contracts, including some interest-rate-related instruments, based on the same response scale as before. Funds were asked to specify other options instruments used.

Among the equities-related instruments, the most commonly employed contracts are Share Price Index (SPI) futures, and call and put options written on specific company stocks, pre-

sumably the 20 stocks traded on the Australian Options Market. More than half the funds use all the derivatives available to fund managers, with an emphasis on interest-rate-related instruments.

Reasons for using derivatives

Table 4 summarises the scores attracted to the six reasons nominated on the questionnaire. Risk reduction (reasons a and b) is a prominent motive for both instruments, with options preferred for reducing risk exposure. Risk reduction encompasses portfolio protection, which was the primary motive identified by Block and Gallagher (1988). Futures have lower transaction costs and are clearly preferred for liquidity enhancement. Block and Gallagher (1988) also note

the importance in the US of the use of futures and options for index arbitrage and program trading.

In Australia it appears these motives are subsumed in value enhancement and liquidity enhancement (reasons e and f).

American studies consistently report that large funds are proportionately greater users of derivatives. The reason commonly given is that larger companies can afford specialist investment personnel.

In Australia, trading in derivative securities may also be preferred by large funds when the market for the underlying security is thinly traded; ie, where "physical" trading would induce significant price volatility.

A similar positive association exists in Australia: the simple correlation between fund size and the extent of use of derivatives is significantly positive ($r = +.42$ for options, and $r = +.44$ for futures). To test for a relationship between size and the use of personnel specialising in derivatives, fund data were pooled by manager because economies from specialisation should accrue at the manager level.

The association between manager size and use of derivative specialists is found in Australia to be weakly positive, but not sufficiently strong to achieve statistical significance ($r = 0.22$). There is also no significant relationship between the use of derivative specialists by managers and the use of options ($r = +.05$) or futures ($r = -.16$).

Table 5 shows simple correlations between fund size and reasons for the using derivatives. Inferences can be drawn only from the correlations that are statistically significant. There is some evidence that larger funds use derivatives to enhance liquidity, which is consistent with the argument that large funds are more affected by thinness in markets for physical securities. However, options appear to be preferred to futures for this purpose.

In contrast, smaller funds are relatively greater users of derivatives for the purpose of enhancing portfolio value.

Non-use of derivatives

Where derivatives were not used, fund managers were asked to select or add reasons, the strength of which were graded on the same 1-5 scale (5 = very much so). Only five pooled funds

Table 2: Scores (1 to 5) for equities management techniques

Technique	Mean	Standard deviation
Fundamental analysis		
Top-down forecasting	4.16	1.05
Financial ratio analysis	3.50	1.33
P/E analysis	3.47	1.33
Quantative analysis	3.26	1.22
Technical analysis		
Charting	2.24	0.99
Moving averages	2.00	1.11
Contrary opinion	2.00	0.93
Portfolio analysis		
Portfolio betas	2.42	1.18
Asset pricing models	1.89	1.10
Arbitrage pricing	1.81	0.98

Table 3: Relative frequency of use of options and futures contracts

Option contracts	Calls		Puts	
	No.	%	No.	%
All Ordinaries Share Price Index	21	72.4	21	72.4
Fifty Leaders Index	3	10.3	2	6.9
90-day bank bills	17	58.6	17	58.6
3-year Commonwealth Treasury bonds	20	69.0	18	62.1
10-year Commonwealth Treasury bonds	26	89.7	25	86.2
Specific company	24	82.8	24	82.8
Offshore instruments	16	55.2	18	62.1
Over-the-counter	5	17.2	3	10.3
Futures Contracts				
All Ordinaries Share Price Index	27		96.4	
Fifty Leaders Index	8		28.6	
90-day bank bills	19		67.9	
3-year Commonwealth Treasury bonds	19		67.9	
10-year Commonwealth Treasury bonds	25		89.3	
Negotiated forward agreements	16		57.1	
Offshore instruments	16		57.1	

Table 4: Scores (1 to 5) on reasons for using derivatives

Reason	Options		Futures	
	Mean	Standard deviation	Mean	Standard deviation
a. Efficacy as hedging device	3.48	1.17	3.61	1.41
b. Capacity to reduce risk exposure	4.04	1.14	3.04	1.30
c. Fewer administrative problems	1.87	0.85	2.33	1.18
d. Lower transaction costs	2.43	1.06	3.83	0.85
e. Liquidity enhancement	2.38	1.07	3.67	1.28
f. Enhance value of portfolio	3.44	1.32	3.05	1.34



Larger funds are greater users of derivatives, mainly for enhancement of liquidity, for which options, rather than futures, seem preferred.

On the other hand, smaller funds use derivatives less, and then mainly to enhance fund value.



did not use options, and six did not use futures. The results are given in Table 6.

Unsuitability is given as the prime reason for funds not using futures and options. No fund gave previous poor experience or lack of knowledge as a reason.

This is in contrast to the findings of Block and Gallagher (1988) that in American bank trust departments legal obstacles and lack of knowledge were the main reasons.

Conclusion

For equities management, fundamental analysis continues to be the most favoured analytical technique employed by Australian pooled superannuation funds. This is consistent with findings for their American counterparts and other investment funds, but at the same time their use of derivatives, especially by the larger funds, is higher than that reported for the United States. This result is interpreted as reflecting thinness in at least some local markets for physical securities.

The larger funds are greater users of derivatives, mainly for enhancement of liquidity, for which options, rather than futures, seem preferred. On the other hand, smaller funds use derivatives less, and then mainly to enhance fund value. ■

NOTES

1. The Australian Bureau of Statistics estimates the size of the superannuation industry in Australia \$152 billion at 31 March 1993.
2. Carter, R.B., and H.E. Van Auken (1990), "Security Analysis and Portfolio Management", *Journal of Portfolio Management*, Spring, pp. 81-85.
3. Block, S.S., and T.J. Gallagher (1988), "How Much Do Bank Trust Departments Use Derivatives?" *Journal of Portfolio Management*, Fall, pp. 12-15.
4. Block, S.S., and T.J. Gallagher (1990), "The Use of Stock-Index Futures and Options by Nontrust Professional Money Managers", in F.J. Fabozzi (ed), *Managing Institutional Assets*, New York: Harper and Row.

Table 5: Correlation between fund size and reasons for using derivatives

Reason	Options	Futures
Enhance portfolio value	-0.41**	-0.39*
Enhance portfolio liquidity	0.37*	0.29
Reduce risk exposure	-0.03	0.08
Reduce transaction costs	-0.13	-0.04

* significant at the 5% level

** significant at the 2% level

Table 6: Number of reasons for non-use of derivatives

Reason	Options	Futures
Cost	1	1
Management resistance	1	1
Trust deed restrictions	1	0
Corporate policy	0	1
Not suitable for fund purposes	4	5
Lack of knowledge	0	0
Previous poor experience	0	0

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