

# PORTFOLIO CONSTRUCTION AND RISK IN MANAGEMENT PROPERTY SECURITIES FUNDS

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## ABSTRACT

*The key issue of the number of property trusts to be included in property securities fund portfolios is considered. Using portfolio risk simulations over 1994–2000, it is shown that property securities funds are including more property trusts than are required to achieve optimum portfolio risk, largely due to other risk management criteria that need to be included in effective investment decision-making for property securities funds. This is found to include a range of portfolio construction constraints, such as tracking error, compliance and limiting exposure to individual property trusts. Once these additional criteria are factored in, property securities funds are still including sufficient property trusts for optimum portfolio construction.*

**Keywords:** Property securities funds, property trusts, diversification, risk management, tracking error, investment strategy

## INTRODUCTION

Based on market capitalisation growth, listed property trusts (LPTs) have been the most successful indirect property investment vehicle in Australia over the last fifteen years (Property Investment Research, 2000). At September 2001, the LPT sector accounted for over \$40 billion in market capitalisation, representing over 5% of total stockmarket capitalisation (UBS Warburg, 2001). Surveys conducted by the Australian Stock Exchange in 1999 found that the LPT sector was the fastest growing stockmarket sector (by number of investors), increasing its number of investors by 88%, compared to the overall stockmarket increase in investors of 21% (Australian Stock Exchange, 2000).

While LPT and stockmarket performance are correlated ( $r = .67$  over 1985–2000) (Property Council of Australia, 2001), it has been shown that there is no long-run market integration between LPTs and the stockmarket (Wilson and Okunev, 1996, 1999; Wilson et al, 1998). This evidence of market segmentation suggests that there are diversification benefits from including LPTs and shares in an investment portfolio.

While investors can invest in individual property trusts, property securities funds are also available as an investment option. These managed investment funds are unlisted vehicles that invest in a portfolio of listed property trusts. The advantage of property securities funds is the opportunity to invest in professionally managed funds, each offering the ability to achieve significant spread or diversification across the spectrum of property trusts.

Currently, property securities funds are available in Australia from a wide range of institutional investors and funds managers, with the property securities fund market (including both retail and wholesale funds) being approximately \$3.4 billion (Property Investment Research, 2001). Table 1 lists the major (retail) property securities funds which accounted for over \$2.1 billion in funds under management at December 2000 (Property Investment Research, 2001). Typical characteristics of these property securities funds are initial fees of up to 5%, annual management fees of up to 2.04% and minimum investments of up to \$5,000. Management expense ratios<sup>1</sup> (MERs) were 0.72–2.04%, with indicative MER values being approximately 1.7%. Benchmarked against the ASX200 Property Index (ASX200P), 45% of these property securities funds gave higher returns than the ASX200P in 2000 and 63% had lower risk profiles than the ASX200P. 63% of these property securities funds also had overall fund ratings<sup>2</sup> at least equivalent or superior to the ASX200P (Property Investment Research, 2001).

**Table 1: Profile of the major property securities funds: December 2000**

<b>Property securities fund</b>	<b>Level of funds</b>	<b>Initial fee</b>	<b>Annual management fee *</b>	<b>Minimum investment</b>	<b>MER</b>
MLC	\$488M	5%	1.61%	\$2,000	1.61%
Westpac	\$420M	<3%	1.66%	\$5,000	1.66%
Paladin (Deutsche)	\$405M	.5%	0.75%	\$5,000	0.72%
AMP	\$208M	<4%	2.04%	\$1,500	2.04%
Colonial First State	\$180M	<4%	1.50%	\$1,000	1.50%
Australian Unity	\$140M	<4.1%	1.72%	\$1,000	1.72%
Commonwealth	\$80M	3%	1.66%	\$2,500	1.66%
ANZ	\$71M	<5%	1.87%	\$5,000	1.87%
BT	\$61M	<3%	2.02%	\$5,000	Not available
HSBC	\$54M	<4%	2.04%	\$1,000	1.77%
APN	\$23M	0%	1.25%	\$5,000	1.25%

\* : taken prior to distributions

<sup>1</sup> Management expense ratio is the ratio of fund operating expenses for the year (including management fee) to the average net asset value of the fund

<sup>2</sup> PIR assign overall ratings to each property securities fund from C (totally unacceptable) to AAA (exceptional) grades, using fifteen factors relating to property portfolio quality and investment evaluation to generate return ratings adjusted for the inherent risks of the investment (PIR, 2000).

In terms of portfolio construction and portfolio risk management for property securities funds, a fundamental issue in minimising risk is how many property trusts should be included in the property securities fund portfolio. The general issue of how many shares should be included in a diversified portfolio has been extensively debated in the finance literature for over 30 years (see, for example, Elton and Gruber, 1977; Evans and Archer, 1968; Fischer and Lorie, 1970; Johnson and Shannon, 1974; Lloyd, Hand and Modani, 1981; Lorie, 1975). By simulating share portfolios of increasing numbers of stocks, most of these studies found that portfolios of 10–15 shares achieved most of the portfolio diversification and risk reduction benefits. However, some studies (eg: Statman, 1987; Tole, 1982) found that 25–40 shares were needed to achieve optimal portfolio diversification.

Typically, the major property securities funds in Australia have at least 10 and up to 30 property trusts in their portfolios from a total LPT universe of 50 property trusts (at the time of this study). This LPT universe has reduced significantly in 1999–2001, resulting from substantial merger and acquisition activity. This now sees a total LPT universe of approximately 35 LPTs (UBS Warburg, 2001).

Given the significance of property securities funds as investment opportunities for Australian investors, the purpose of this paper is to:

- (i) conduct an extensive simulation study over 1994–2000 to examine the impact of the number of property trusts in the portfolio on the portfolio risk reduction for Australian property securities funds.
- (ii) consider the relevance of (i) above on the investment philosophy, portfolio construction and risk management procedures for property securities funds in Australia as determined by structured interviews with fund managers.

## **METHODOLOGY**

### **Data sources**

Monthly share prices and market capitalisations were obtained for 13 property trusts over the period of June 1994–September 2000. These property trusts are shown in Table 2 with their market capitalisation at September 2000, having a total market capitalisation of \$19.6 billion, which represented 60% of the total ASX property trust sector market capitalisation.

All other available property trusts were omitted from this study as they did not cover the full 6-year period of analysis or were subject to merger and acquisition activity over this period. These include the Mirvac Group, Westfield America Trust, AMP Retail Trust, AMP Office Trust and Goodman Hardie Industrial Trust.

**Table 2: List of property trusts in simulation study: June 1994–September 2000**

<b>Property trust</b>	<b>Market capitalisation (\$M) (Sept 2000)</b>	<b>Annual risk (%) (June 1994– Sept 2000)</b>
Westfield Trust	5,808	14.10
General Property Trust	4,452	15.54
Stockland Trust Group	2,013	13.18
Gandel Retail Trust	1,382	14.18
AMP Diversified Trust	1,051	13.57
AXA Australian Diversified Trust	1,020	13.94
Advance Property Fund	804	16.89
Centro Properties Group	801	13.54
Westpac Property Trust	738	13.39
Macquarie Office Trust	623	12.89
BT Office Trust	366	13.92
AMP Industrial Trust	322	13.09
Armstrong Jones Retail	215	15.54

### **Portfolio risk analysis**

To assess the impact of the number of property trusts in the portfolio on portfolio risk, simulations were carried out for the two following scenarios:

- (1) equal-weighted portfolio
- (2) portfolio weighted by market capitalisation,

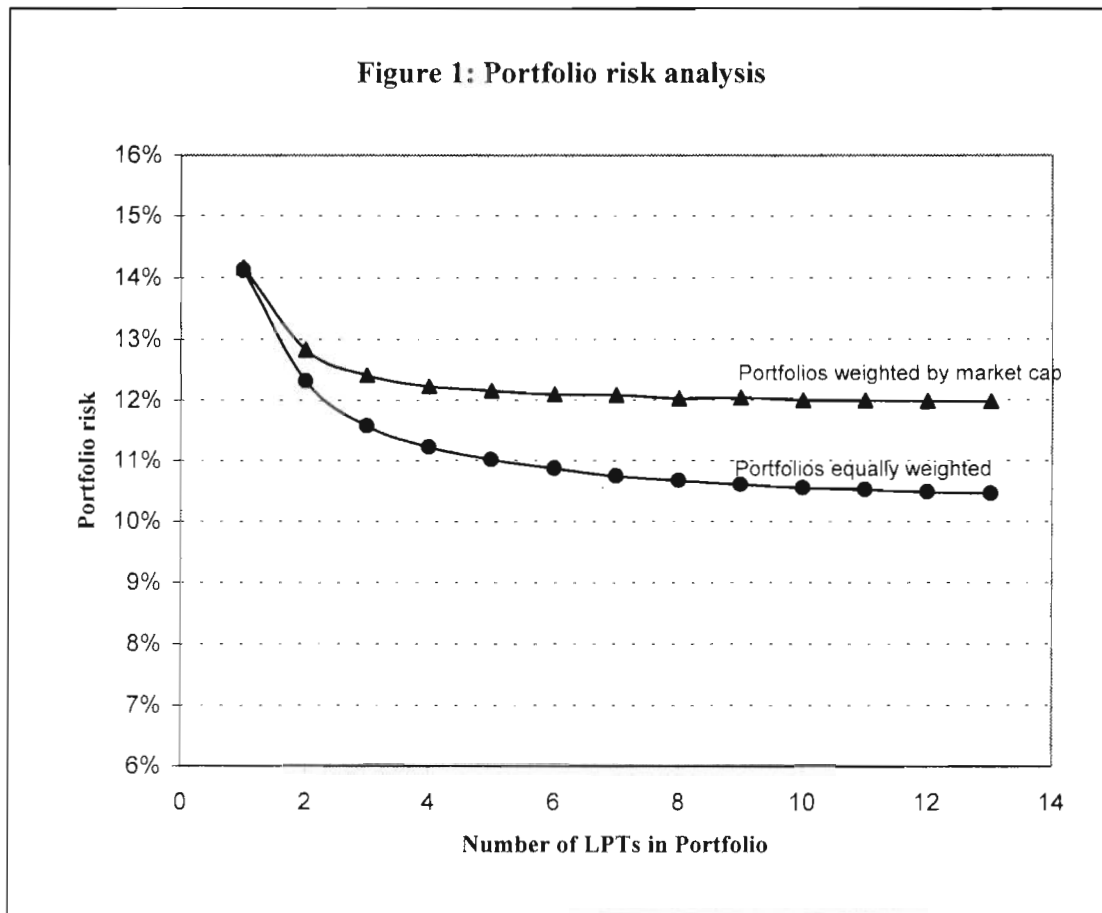
using the Evans and Archer (1968) procedure. Portfolios of increasing numbers of property trusts were constructed (portfolios of up to 13 property trusts) and the resulting portfolio risks determined. To ensure reliable portfolio risk estimates, this procedure was repeated 1,000 times for each potential number of property trusts in the portfolio, with the average portfolio risk (from 1,000 simulations) then determined for each portfolio size (up to 13 property trusts). In total, 13,000 portfolio risk simulations were carried out for each of the two above portfolio construction scenarios.

## Portfolio construction and risk management

Details of the specific portfolio construction and risk management strategies adopted by the above individual property securities funds were determined by personal interviews with funds managers (conducted by the authors) and from Property Investment Research (2001). Issues relating to investment philosophy, portfolio construction and risk management procedures were critically assessed for each property securities fund.

### PORTFOLIO RISK SIMULATION

Figure 1 presents the simulation results for the impact of the number of property trusts in the portfolio on portfolio risk for both equal-weighted and market capitalisation-weighted scenarios. Similarly, Table 3 presents the percentage level of portfolio risk reduction achieved across the varying numbers of property trusts for both of the above scenarios.



As property trusts with higher market capitalisation tend to be more volatile, resulting from greater liquidity on short-term cycles (Upton, 1999), this results in the market capitalisation-weighted portfolio having higher portfolio risk levels than equal-weighted portfolios for all portfolio sizes. Table 3 shows that the bulk of the portfolio risk reduction is readily achievable with portfolios of 8–10 property trusts for the equal-weighted portfolio and with portfolios of 6–8 property trusts for the market capitalisation-weighted portfolio. This is below the usually stated “10–15” shares from previous general stockmarket studies (eg: Evans and Archer, 1968). The likely

causes of the lower number of LPTs needed to be held in an optimal portfolio compared to the typical number of shares needed are:

- the property sector-specific nature of LPTs compared to the diverse range of general stockmarket sectors
- the low risk attached to LPTs, reflecting their status as a defensive stock, compared to other stockmarket sectors.

**Table 3: Percentage reduction in portfolio risk**

<b>Number of property trusts</b>	<b>Equal-weighted portfolio (%)</b>	<b>Market capitalisation-weighted portfolio (%)</b>
1	n.a.	n.a.
2	12.75	9.46
3	17.99	12.35
4	20.47	13.69
5	21.95	14.18
6	23.02	14.61
7	23.87	14.75
8	24.43	15.10
9	24.86	14.96
10	25.28	15.31
11	25.50	15.38
12	25.71	15.46
13	25.92	15.53

Since the stability of the “averaging” process in the simulations to determine portfolio risk levels has been questioned by some researchers (eg: Tole, 1982), Table 4 presents the minimum and maximum portfolio risk levels achieved for each number of property trusts in the portfolio under both simulation scenarios. The variability about the average risk in each scenario is not significant across the number of property trusts in the portfolio. Given the resulting stability of these portfolio risk estimates, this does not indicate the need to increase the number of property trusts in the portfolio from the previously stated levels of “8–10” property trusts (equal-weighted portfolio) and “6–8” property trusts (market capitalisation-weighted portfolio) to achieve the bulk of the portfolio diversification benefits for all property securities funds.

**Table 4: Variation in portfolio risk**

Number of property trusts	Equal-weighted portfolio risk (%)				Market capitalisation-weighted portfolio risk (%)			
	Average	Min.	Max.	Range	Average	Min.	Max.	Range
1	14.12	12.77	16.89	4.11	14.17	12.89	16.89	4.00
2	12.32	10.55	14.27	3.73	12.83	10.65	15.04	4.39
3	11.58	9.87	13.40	3.53	12.42	10.24	14.47	4.23
4	11.23	9.82	12.89	3.07	12.23	10.08	13.98	3.90
5	11.02	9.79	12.38	2.59	12.16	10.03	13.52	3.49
6	10.87	9.76	12.17	2.41	12.10	10.12	13.20	3.08
7	10.75	9.77	11.84	2.07	12.08	10.05	12.98	2.93
8	10.67	9.91	11.65	1.74	12.03	10.05	12.80	2.75
9	10.61	9.88	11.39	1.51	12.05	10.28	12.63	2.35
10	10.55	9.98	11.21	1.24	12.00	10.35	12.47	2.12
11	10.52	10.09	10.97	0.88	11.99	10.52	12.31	1.79
12	10.49	10.24	10.76	0.52	11.98	11.22	12.14	0.92
13	10.46	10.46	10.46	0.00	11.98	11.98	11.98	0.00

## **PORTFOLIO CONSTRUCTION AND RISK MANAGEMENT STRATEGIES**

How do the results of this portfolio risk simulation study match up with the practicalities of the investment strategies for the managers of property securities funds?

### **Investment philosophy and management strategy**

Most property securities fund managers used a bottom-up approach to individual property trust selection, with a top-down overlay of economic conditions and property markets. Management styles tended to be active rather than replicating market indices. This necessitates disciplined methodologies (eg: quantitative modelling to assess expected IRRs, ratio analysis etc) for property trust selection to capture underpricing opportunities, establishing overweight/underweight positions relative to index benchmarks and managing investment risk.

Typical goals of those property securities funds analysed were to outperform the ASX200P benchmark by up to 1.5% per annum, with some funds qualifying this goal to a longer term strategy of outperformance over the full economic cycle.

## Portfolio construction and constraints

In addition to optimising risk, a number of portfolio constraints were generally utilised by those property securities funds analysed in constructing property trust portfolios. These typically included:

- minimum of 15 property trusts in fund, with up to 25 property trusts in fund
- maximum level of exposure to any one property trust; either by percentage of market capitalisation (eg: 5%, 10%) or linked to index weighting (eg: factor of 1.5 or double) or linked to quartiles in value rankings
- maximum level of property-related stock not in ASX200/ASX300 property index (eg: 5–10%); this includes both LPTs not in the ASX200/ASX300 and property-related companies (eg: developers and contractors, infrastructure)
- maximum level of cash (eg: 5%), with actual cash levels generally well below this maximum
- minimum turnover rates (eg: \$3M monthly, 30% per annum)
- maximum tracking error<sup>3</sup> of 2% against ASX200/ASX300 property index benchmark.

## Tracking error analysis

With an increased funds management focus on index funds and benchmarking performance, the use of tracking error has taken on increased significance in portfolio construction. As such, Figure 2 presents the tracking error simulation analysis for both equal-weighted and market capitalisation-weighted portfolios over 1994–2000 using the Evans and Archer simulation procedure used previously. To achieve the tracking error levels of 2% indicated above, portfolios would need more than 13 property trusts.

The tracking error simulation analysis has indicated more LPTs are needed in the optimal portfolio compared to that seen in the portfolio risk simulation analysis. This clearly highlights the issue that portfolio construction and risk management for property securities funds is a more complex task than just theoretical risk minimisation, and requires other risk management criteria to be included into effective property securities fund investment portfolio decision-making.

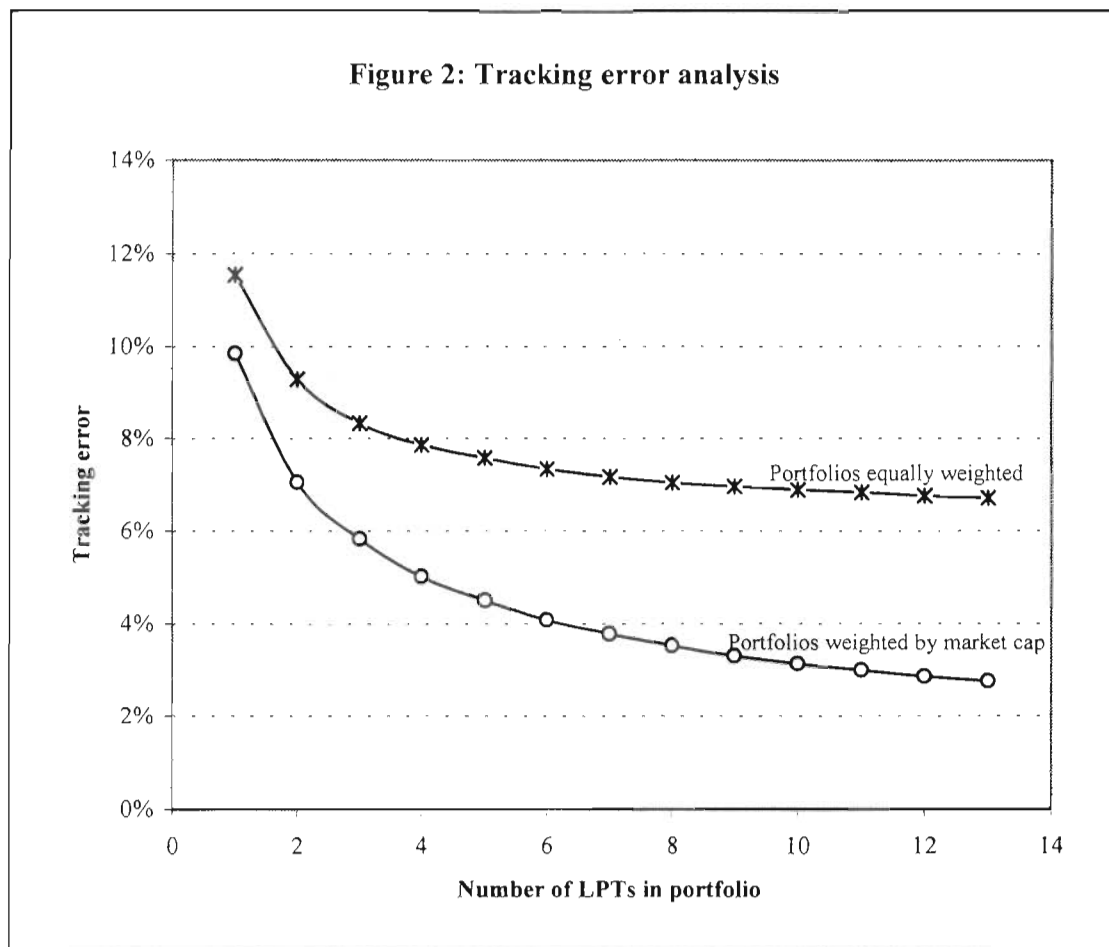
Importantly, even with overlaying this tracking error criteria, typically there are still sufficient property trusts included to meet this criteria. The only downside that this introduces is the ongoing need for performance reporting and monitoring of more property trusts than that needed for the optimal scenario.

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<sup>3</sup> Tracking error is the standard deviation of excess property securities fund returns against a specified performance benchmark



**Figure 2: Tracking error analysis**



### **Risk control and risk management**

Risk management reports generated by the BARRA risk management software were used by most property securities fund managers to measure performance against benchmarks and control risk factors. In-house compliance procedures were also used to define acceptable risk and to monitor management performance.

### **PROPERTY INVESTMENT IMPLICATIONS**

Given the significance and stature of property securities funds as managed fund vehicles for investing in property trusts, these simulation analyses have allowed important insights into the operational aspects of property securities funds.

Firstly, with property securities funds typically having 15–25 property trusts in their fund portfolio, this indicates that property securities funds are operating at levels at which portfolio risk is at an optimum. While the portfolio risk simulation results show that up to 10 property trusts are needed to achieve these optimal portfolio risk levels, it is recognised that portfolio risk is only one of a multitude of criteria that need to be factored into this key investment decision for property securities funds. Other key factors and constraints that relate to portfolio construction (as discussed above) also need to be factored into this investment decision.

Secondly, the tracking error simulation results further support the suitability of the current strategies by property securities funds concerning the number of property

trusts in these property securities funds. While more property trusts are typically included than needed to meet this tracking error criteria, the only additional burden is for increased performance monitoring.

Another fund management style that has become increasingly popular in the last five years is the use of indexing. This sees some property securities funds seeking to replicate the LPT index, charge low management fees and use an active component of up to 20% of the fund to try and slightly outperform the index.

The recent merger and acquisition activity in the LPT sector has seen a significant reduction in the number of property trusts available for inclusion in property securities fund portfolios, with the current number of LPTs available being approximately 35. Whilst this will need to be factored into their ongoing investment decision-making, the current results support the effective portfolio construction and risk management strategies adopted by property securities fund managers.

To extend the research in this paper, areas of future research in property securities fund performance analysis should consider the impact of management fees on performance and the impact of management style on performance.

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