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USING STYLE ANALYSIS TO ASSESS DIRECT PROPERTY PERFORMANCE

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INTRODUCTION

Listed property trusts have been the most successful indirect property vehicle in Australia over the last 15 years. The features of liquidity, divisibility, low entry and exit costs, tax structure and strong investment performance have contributed to this increased popularity of property trusts amongst investors. This has seen over 50 property trusts accounting for over $29 billion in total assets at December 1999 and representing over 5% of the Australian stock market capitalisation.

In 1999, property trust market capitalisation increased by 6%, building on the 42% increase in market capitalisation seen in 1998 (Warburg Dillon Read, 2000). Whilst returns for property trusts in 1999 have been low compared to the overall stockmarket (-5% versus 16.1%), average annual returns over 3 and 5 year investment horizons have been marginally below the ASX (10.5% versus 13.3%, and 11.7% versus 14.9% respectively) (Warburg Dillon Read, 2000).

This raises a number of key property investment issues, including:

- is indirect property an effective investment proxy for direct property?
- is indirect property a property market or stockmarket investment?

The relationship between indirect and direct property has been an area of considerable international research interest over the last ten years (eg: Barkham and Geltner, 1995; Eicholtz and Hartzell, 1996; Giliberto, 1990; Myer and Webb, 1993; Newell and Chau, 1996; Newell and MacFarlane, 1996; Ong, 1995). Most of this research has found indirect property performance more reflective of stockmarket performance than direct property performance, with direct property performance lagging indirect property performance due to their different pricing mechanisms. Despite this international research focus, the above issues still remain leading edge issues for indirect and direct property investment.

In particular, investment dynamics and the key strategic institutional investment issue of how much of property trust performance is attributable to direct property performance has received renewed attention. In the USA, the correlation between REITs and the stockmarket declined significantly from 0.75 to 0.25 over 1986-97. REITs have behaved like a portfolio of 80% direct property, 12% bonds and 8% shares over 1992-97 (Liang and McIntosh, 1998).

For Australian property trusts (see Figure 1), it was found that the correlation between property trusts and the stockmarket declined from 0.75 to 0.55 over 1983-98 (Newell et al, 1999) and property trusts performed similarly to a portfolio of 65% direct property, 12% shares, 8% bonds and 15% cash since 1993 (Newell et al, 1999). Over this 15-year period, property trusts were found to have taken on more of the investment features of direct property. At an individual property trust level, some property trusts were found to have a high level of direct property reflected in their performance over 1983-98; for example, General Property Trust (68%), National Mutual (82%), Centro (86%), Westfield (73%) and Schroders (67%).

Equivalent research into the investment dynamics of Hong Kong property companies (Newell and Chau, 1999) produced markedly different results over 1984-98. Hong

Kong property companies performance similarly to a portfolio of 16% direct property and 84% shares, with the level of direct property reflected in their individual performance ranging from 22% - 52%. This reflects structural differences and the closer alignment of Hong Kong property companies with the stockmarket than the Hong Kong property market.

Having assessed this level of direct property in property trust performance, the procedure of style analysis can be further used to extract a more responsive direct property performance series from this property trust performance data. This "stripped-out" direct property series will hopefully overcome the well-known problems associated with valuation-based property performance indicators, and provide a reliable and more responsive indicator of direct property performance.

This paper will use style analysis to extract a direct property performance series from Australian property trust performance data over 1986-98. This direct property series will be validated against the Property Council of Australia's valuation-based direct property benchmarks for Australian commercial property.

METHODOLOGY

Data sources

Monthly stockmarket (ASX) share price indices:

- Property trust index: 1986-98
- All Ordinaries index: 1986-98

were utilised.

Equivalent monthly financial market series for 10-year bonds and 90-day bills over 1986-98 were also utilised. The Property Council of Australia (PCA) office, retail, industrial and total property series were used as the investment performance benchmarks for direct property performance (Property Council of Australia, 1998).

Statistical analysis

To assess the changing investment dynamics and style of property trust performance over time, style analysis via multi-factor asset allocation mix models over 1986-98 were used. The general asset allocation mix model (Sharpe, 1992) is given by:

$$\mathbf{R = b_1F_1+b_2F_2+ \ldots. +b_kF_k+e} \qquad (1)$$

where:

R = property trust return
F_i = return on ith financial or stock market factor
b_i = model coefficient that represents financial/stockmarket factor weighting in asset allocation mix
e = residual component.

Constrained asset allocation mix models were utilised using the "Solver" routine in Excel. The constrained asset allocation models ensure model coefficients or weightings are positive and sum to 100% to reflect the asset allocation mix in practice. The performance technique of style analysis for evaluating property portfolios has also been effectively used (Lee, 1999; Myer and Webb, 1996).

"Stripping-out" a direct property series

Based on this style analysis and asset allocation mix model, the allocation to direct property in each period can be determined, and a more responsive direct property performance series extracted from this Australian property trust performance information.

For the model involving shares, bonds and cash:

$$\mathbf{R_{PT} = b_s R_s + b_B R_B + b_c R_c + e} \qquad (2)$$

While property trusts and direct property have different pricing mechanisms, it would be highly likely that this unexplained variation is largely attributable to direct property performance, although this can not be tested conclusively.

Fitting this constrained model, and using $1\text{-}R^2$ as the percentage allocation to property, then:

$$\mathbf{R_{PT} = b'_s R_s + b'_B R_B + b'_c R_c + b'_b R_P} \qquad (3)$$

where b'_s, b'_B, b'_c, b'_P are adjusted portfolio weights such that $b'_s + b'_B + b'_c + b'_P = 1.0$

By rearranging equation (3):

$$\mathbf{R_P} = \frac{\mathbf{R_{PT} - b'_s R_s - b'_B R_B - b'_c R_c}}{\mathbf{b'_P}} \qquad (4)$$

gives the appropriate return over specified time periods for direct property.

Using rolling time periods, specific returns can be stripped out for the direct property series at the desired frequency; monthly, quarterly etc. In the case of benchmarking against the PCA property series, this is done on a six-monthly basis.

RESULTS AND DISCUSSION

Generating the "style analysis" direct property series

Using rolling five-year windows, the style analysis procedure from equation (4) was used to strip-out a monthly direct property series from the original property trust index series over the period of December 1990 to June 1998. Figure 2 presents this stripped-out direct property series, as well as the four six-monthly PCA property series (total, office, retail, industrial) for comparative purposes. This stripping-out

procedure was also applied to several individual property trusts, with the resulting direct property series from the General Property Trust series shown in Figure 3.

Features of new direct property series

The direct property series generated by this style analysis procedure using the listed property trust index has a number of attractive features when compared to the valuation-based PCA direct property series. These include:

- higher annual risk (10.54%) than the PCA total property series (5.54%) over 1990-1998; this is consistent with the impact of valuation-smoothing and the resulting lower than expected risk profile for direct property from using valuation-based performance information rather than transaction-based performance information (Newell and MacFarlane, 1998).

- no significant serial correlation in the return series, with serial correlations of .16, -.30, .18 and -.01 at lags of 6, 12, 18 and 24 months respectively, being consistent with a transaction-based series. This compares with the significant serial correlation structure in the PCA total property returns series of .88, .69, .51 and .36 at lags of 6, 12, 18 and 24 months respectively; again reflecting the impact of valuation-smoothing and the use of valuation-based performance information rather than transaction-based performance information (Newell and MacFarlane, 1996, 1998).

- being valuation-based, the PCA property series are likely to lag actual property market movements. As shown in Table 1, this new stripped-out property series leads the PCA total property series by 6-12 months; hence it is likely to be a more responsive indicator of direct property performance than the valuation-based PCA direct property series.

- the individual property trusts are also able to generate effective and more responsive direct property series for both total property and sector-specific property. As shown in Table 1, the diversified property trusts (eg: General Property Trust, National Mutual, Schroders) align and lead the PCA total property series by 6-12 months, while the sector-specific property trusts (eg: Colonial Industrial, Centro and Westfield) also align and lead the respective PCA property sector-specific series by 6-12 months.

- the new direct property series can be stripped-out more frequently than the six-monthly PCA direct property series; this will generate a more frequent (eg: monthly, quarterly) and more responsive direct property performance indicator for property portfolio benchmarking and portfolio evaluation purposes.

CONCLUSION

Using style analysis, a direct property performance series can be extracted from property trust performance data. The resulting direct property series have several desirable features that overcome the problems of using valuation-based performance series which tend to lag the property market and exhibit valuation-smoothing.

Further research is currently being undertaken by the authors to further validate the integrity of this procedure in generating a more responsive indicator of direct property performance. In particular, the use of the Warburg Dillon Read sector-specific property trust indices are being assessed to extract more responsive sector-specific direct property series, as well as the style analysis procedure tested for USA REITs, and property companies in the UK and Hong Kong.

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Table 1: Correlation analysis of "style analysis" direct property series and PCA direct property benchmarks

Property trusts	Lagged correlations r_{OM}	r_{6M}	r_{12M}	r_{18M}
PROPERTY TRUST INDEX				
Total	.01	.21	**.40**	.23
Office	-.03	.19	**.40**	.19
Retail	-.05	.14	**.43**	.20
Industrial	.04	.26	**.31**	.10
GENERAL PROPERTY TRUST				
Total	.03	.39	**.53**	.46
Office	-.01	.37	**.56**	.38
Retail	-.18	.19	.16	.13
Industrial	.12	.31	.48	.38
COLONIAL INDUSTRIAL				
Total	.22	.29	.59	.50
Office	.17	.31	.53	.56
Retail	.36	-.23	.23	-.10
Industrial	.20	.24	**.56**	.52
NATIONAL MUTUAL				
Total	.60	.71	**.56**	.48
Office	.56	.64	.61	.47
Retail	.13	.10	-.13	-.45
Industrial	.63	.80	.42	.47
CENTRO				
Total	-.01	.11	.01	-.53
Office	.02	.14	-.03	-.45
Retail	.20	.11	**.30**	-.20
Industrial	-.21	.07	-.01	-.51
SCHRODERS				
Total	.20	.54	**.65**	.58
Office	.11	.47	**.65**	.56
Retail	.08	.33	.20	-.20
Industrial	.29	.61	.51	.47
WESTFIELD				
Total	-.45	-.41	-.22	-.52
Office	-.39	-.38	-.26	-.52
Retail	-.20	-.15	**.53**	.30
Industrial	-.56	-.33	-.20	-.60

Figure 1: Performance style of property trusts: January 1983-June 1998

Figure 2: Comparison of "style analysis" direct property series and PCA direct property benchmarks

Figure 3: Comparison of GPT "style analysis" direct property series and PCA direct property benchmarks