PERCEPTION VERSUS REALITY:
THE PORTFOLIO ALLOCATIONS OF UK PROPERTY COMPANIES

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ABSTRACT

The property portfolio allocation of property companies could be determined through a risk and return analysis of each sector considering an acceptable level of risk. This study applied a constrained multiple regression model to the examination of property portfolio exposure. An asset class factor model namely return-based style analysis (RBSA) was developed by Sharpe (1988, 1992) to measure the exposures of each component of a mutual fund's portfolio to movements in their returns. Total returns from ten public-listed property companies (PLPCs), based on their share price movements, were used to estimate the style exposures of three commercial property types - retail, office and industrial. The data used for share price movements are from the first quarter of 1987 to the fourth quarter of 1998. The study examined the relationship of the return for three commercial property types to each portfolio of PLPC. The effective portfolio allocations that are derived by RBSA are then compared with the actual average portfolio allocation of the property companies. RBSA is seen to be a particularly effective tool in the explanation of the returns of PLPCs pursuing growth or income strategies. This study also found that other aspects of portfolio allocation determinants such as gearing, the features of the property portfolio and the property market cycle were worthy of consideration.

Keywords –   Commercial property, Portfolio allocation, Portfolio strategy, Return-based style analysis

1.   INTRODUCTION

Investment in property constitutes an important part of the U.K. investment market. The factors affecting and determining this investment must be of interest to any participants in the property or construction industries. This paper is concerned with a study of the property portfolio strategies of a selection of the major property companies in the U.K. The terminology of portfolio strategy relates to the diversification of financial assets. There is little formal literature on property portfolio strategy (Brown, 1991) dealing with the establishment of an optimal property portfolio allocation. However, most of the work on portfolio strategy is concerned with how to manage the property portfolio in order to maximise the organisation's wealth and minimise risk through diversification.

Property portfolio strategy cannot rely merely on the intuitive judgement and experiences of property decision-makers. Since commercial property investment has been allotted a place alongside other investment media such as equities, bonds and cash in the portfolios of the investing institutions, it has become inevitable that the financial management tools for those assets would have to also be applied to property. Nevertheless, the reliability of these techniques seems to depend on the adequacy of the time-series data that relate to property performance measurement. Return-based style analysis (RBSA), developed by William F. Sharpe (1988 and 1992), can identify the attribution of the historical pattern of an investment portfolio. The technique is concerned with the behaviour of an investment if the time series information gives adequate explanation of the relationship between the total return of the investment and the return of the asset classes. The approach is widely used by investment professionals seeking to understand the composition of investment portfolios.

This research investigated an approach to estimate a statistical relationship between the time series of public listed property companies' (PLPC) returns and a set of time series indexes representing portfolio investment strategies. The primary objective of this study was to examine the nature of the portfolio strategy of PLPCs and the implication for property portfolio allocation. The research intended to explore in a systematic manner, the impact of portfolio strategy as it affects the risk and performance of PLPCs through the application of RBSA. The asset mix of the portfolio emphasises commercial property as this contributes most of the property investment activities in the U.K. Most of the debate on RBSA looks at the asset mix of mutual funds (Sharpe, 1988 &1992; Christopheson, 1995; Trzcinka, 1995; Lucas, 1996; diBartolomeo and Witkowski, 1997; Gallo and Lockwood, 1997; Lobosco and diBartolomeo, 1997; Bogle, 1998).

This research focused on the behaviour of property companies in allocating their portfolio investment, particularly in commercial properties. A number of studies have been undertaken on property funds in the U.K. (Lee, 1999) and on the REIT [Real Estate Investment Trust] in the USA (Liang and McIntosh, 1998). The application of RBSA to a property portfolio has become a standard industry tool for appraising the style of an investment fund (Lobosco, 1999).

2.   RETURN-BASED STYLE ANALYSIS (RBSA)

RBSA is a factor model - a form of constrained regression that identifies the attribution of the historical return pattern of an investment portfolio of a mutual fund using market indexes. The coefficients derived from the analysis (termed RBSA weights or style exposures) are used to form inferences about the behaviour of the portfolio and its composition. RBSA is very much concerned about measuring the performance of portfolio managers on their *management styles.* Christopherson (1995) argued that the style exposure does provide some information on how the manager has performed in the past but held reservations on its use in forecasting future behaviour. Trzcinka (1995) defended RBSA by pointing out that its simplicity and objectivity makes it useful as a communication tool between shareholders as sponsors and portfolio managers. The portfolio manager's management style can be easily identified and a view taken of how it has changed over time

(Lee, 1999). Thereby, remedial modification of management styles may be possible to add to the value of the portfolios.

RBSA is only intelligent with a data-input that is properly selected and the analytical skills of those that use it. In order to undertake a valid application, the period of the style exposure and benchmarks or factors must be carefully chosen. The factor model in this research can be presented in equation form (Sharpe, 1992; Lee, 1999):

$$C_A = b_{A1}f_1 + b_{A2}f_2 + b_{A3}f_3 + \varepsilon_A \tag{1}$$

where, C_A represents the return to company A based on changes in share prices; f_1 to f_3 are the returns on the three commercial property types; b_{A1} to b_{A3} are the exposures or sensitivities of C_A to factors f_1 to f_3, and ε_A is the error unexplained by the model.

The three indexes of commercial property returns (retail, office and industrial) represent the various approaches or management style of the company. A standard multiple regression equation uses the return of the company as the dependent variable and the factors are the independent variables. Normally, multiple regression computations would provide a set of coefficients (b_{A1} to b_{A3}) for the estimation of the sensitivity of the company's return to the returns of the commercial property indexes. Each coefficient carried either a negative or a positive value. As the study was aimed at estimating an effective portfolio allocation of each type of property, two constraints of each coefficient magnitude are important in the RBSA. The first constraint is that the coefficients have only 0 to 1 value:

$$0 \leq b_{A1}...b_{A3} \leq 1 \tag{2}$$

The second is that the sum of the coefficients must be equal to 1:

$$\sum_{k}^{3} b_{Ak} = 1 \tag{3}$$

In determining the best allocation of the company's effective portfolio allocation through this model, the coefficients appear as portions of a property portfolio and represent company A's portfolio allocation of factor f_1, f_2 and f_3. The RBSA needs to be evaluated and R^2 is used to explain the returns of C_A in equation (4). R^2 is the proportion of variance explained by the property types indexes. It is defined as:

$$R^2 = 1 - \frac{Var(\varepsilon_A)}{Var(C_A)} \tag{4}$$

R^2 is the proportion of the variance for C_A, which is explained by the three commercial property types of the property portfolio after subtracting the proportion of unexplained variance (ε_A).

Equation (1) with constraints (2) and (3) are then optimised using SOLVER of Microsoft's EXCEL for Windows spreadsheet. SOLVER is capable of determining the maximum or minimum value of one cell by changing other cells. Besides the constraints of equation (1), the analysis was accomplished by minimising the variance of ε_A

2.1   The Data and Analysis

This study evaluates ten selected public listed property companies (PLPCs) using equation (1). The data consist of time series of quarterly returns of the companies that satisfy two conditions. Firstly, the main activity of the company is the property business, whether property investment, management or development. Secondly, the property portfolio must comprise at least seventy percent U.K. commercial property. The bases for these two conditions were due to the nature of the RBSA itself and the limitation of the availability of the relevant information. The underlying assumption of RBSA, as shown in equation (1), is that the returns of three different types of property reflect the returns of the PLPC. In consideration of those constraints, only ten PLPCs have been selected in order to corroborate the reliability of the results. Detailed information on PLPC strategy related to portfolio decisions is difficult to obtain due to confidentiality considerations.

The commercial property type indexes were obtained from the IPD (Investment Property Databank). The IPD was established in 1985 and it is the largest source of information on investment property in the U.K. However, the commercial property indexes, which were segmented into retail, office and industrial, were only started in January 1987. Therefore, the period covered in this study was from the first quarter of 1987 to the fourth quarter of 1998. Equation (1) is then trailed on a quarter by quarter basis for a period of five years to represent the effective allocation for the most recent quarter. For each calculation, three coefficients denote the three factors (retail, office and industrial). Simultaneously, the average of the residuals (ε_A)[1] or Sharpe's alpha (Liang and McIntosh, 1998) and the R^2 of the model are calculated.

One of the most important features that has to be taken into consideration is that the PLPCs' returns will be reflecting the commercial property returns of the next quarter as the stock returns reflect information about the future property market (Gyourko and Keim, 1992). Monthly returns might be more suitable when using stock, bond or cash factors but the infrequency of property transactions and the long process of property transactions have determined the inappropriateness of the use of monthly basis data in this study. In consequence of the usage of the quarterly returns, five years period analysis of the style attribute is not unreasonable and adequate for capturing the style movement.

2.2 Market Risk or Beta

The variance of returns is commonly used as a measure of total risk. In this context, it measures the dispersion of historic return about the means[2] (Brown [1991]).

$$\sigma_A^2 = \frac{1}{n}\sum_{i=1}^{n}\left[r_{Ai} - \overline{r}_A\right]^2 \qquad (5)$$

where, σ_A^2 is the variance of stock A; r_A is the return for stock A; n is the number of the returns used, usually in various intervals such as daily, monthly, quarterly or annually. The variance contains risk that can be avoided by diversification. Sharpe's capital asset pricing model (CAPM) denotes that beta (β) is a measure of the amount of a stock's risk that will still be there, even after the stock is combined into a fully diversified portfolio. Therefore, beta is the measure of non-diversifiable risk, also called market risk. Using historic returns, the formula for β is (Brown, 1991; Tucker *et al.*, 1994):

$$\beta_A = \frac{\frac{1}{n-1}\sum (r_A - \overline{r}_A)(r_M - \overline{r}_M)}{\frac{1}{n}\sum_{i=1}^{n}\left[r_{Mi} - \overline{r}_M\right]^2} \qquad (6)$$

where, β_A is the beta of stock A; M is the market portfolio; r_A and r_M are the returns for stock A and market portfolio M. It can be simplified to:

$$\beta_A = \frac{COV(r_A, r_M)}{VAR(M)} \qquad (7)$$

According to the CAPM, β_A explains the tendency of stock A to rise and fall with rises and falls in the market as a whole. β_M is always equal to 1 as reflected in the market portfolio. The CAPM is a one period model and β_A might vary over time.

3. THE PERCEIVED PORTFOLIO STRATEGY OF SELECTED PLPCs

Perceptions of the portfolio strategy of each PLPC are obtained from the company's annual report. Although the company may consider portfolio strategy to be a confidential aspect of their strategic management policy, they should explain the strategy explicitly or implicitly in the annual report in order to increase the confidence of their shareholders and other potential investors. The statement of the portfolio strategy is normally highlighted in the Chairman's

Statement or the commentary in the Business Review.

Portfolio strategy determination can be affected by many issues. In order to discern whether a PLPC is pursuing its explicit/implicit portfolio strategy, it is necessary to consider the alternative, potential strategy policies, which it could pursue.

To assist this type of study, previous writers have devised categorisation systems to 'pigeon hole' companies according to their strategy. DiBartolomeo and Witkowski (1997) designated six categories of equity mutual fund based on the classifications used by the major data vendors. These were: (1) aggressive growth, (2) growth, (3) growth-income, (4) income, (5) international and (6) small capitalisation. LaSalle Advisors (1998) have specified five portfolio strategies (as shown in Figure 1).

As we are concerned with a more limited area of study (i.e. property companies with portfolios limited to three commercial property types), we have chosen to modify this model and designate just the three categories depicted in Table 1.

High Return	Opportunistic Strategy	Growth-Oriented	High Risk
	Growth Strategy		
	High Yield Strategy		
	Balanced Strategy		
Low Return	Income Strategy	Security of Income	Low Risk

Figure 1: Determination of Portfolio Strategies
(Source: 1998 Investment Strategy Annual, LaSalle Investment Management Research, Chicago).

Category	Interpretation
Growth Strategy	The company aims to undertake substantial action to expand and maximise its wealth by undertaking an active portfolio policy. The emphasis is more on office and retail property.
Balanced Strategy	The company holds a diversified asset mix with an average allocation of the property portfolio. The attitude is more towards risk-averse strategy by having a balanced proportion of three commercial property types.
Income Strategy	The company aims to maintain their operation and puts less emphasis on expansion the property portfolio, as the main objective is to have a secure income. Most of the activities are undertaken to retain and improve the current portfolio in order to increase the yield and value of the portfolio. The property preferences are retail and industrial.

Table 1. Categories of Portfolio Strategy

Specific illustrations of this designation can be given. Table 2 provides the perceived portfolio strategy of the selected PLPCs. The ten companies are categorised according to their designated category.

MEPC Plc, for instance, had a *growth* portfolio strategy. This is determined from observation of its strategies on how the portfolio is managed in order to maximise the return, whilst at the same time, considering the risk of the portfolio. MEPC Plc reviewed its strategies

between 1993 and 1998 to synchronise its property portfolio with the property market condition during the period. Slough Estates Plc also had a *growth* portfolio strategy as well-organised redevelopment and refurbishment programmes were predetermined to increase the quality and value of their property portfolio.

A company with a *balanced* portfolio strategy will attempt to maintain a balanced proportion of all three commercial property types within its portfolio. Hammerson Plc explicitly aimed to improve the income from the office portfolio including acquisition, disposal, refurbishment and development at appropriate times. At the same time, it has given the priority to the retail sector.

Great Portland Plc is categorised as a company with an *income* growth strategy. It not only had the same strategy for six years, but also maintained the portfolio exposure in the London area.

Movement in the portfolio is one of the best indicators to see how the property companies manage their portfolio and it can be established from the percentage of the average annual addition or disposal of the portfolio between 1993 and 1998. For example, the average annual portfolio disposal of MEPC Plc was £419.0 million and the average annual value of the total portfolio was £3,349.2 million. Therefore, the average annual portfolio disposal of MEPC Plc was 12.5 per cent.

Property Company	Average Annual Portfolio Movement		Average Property Portfolio (£mil)
	Addition (%)	Disposal (%)	
Growth Strategy			
MEPC Plc	11.8	12.5	3,349.2
Great Portland Estates Plc	10.0	2.4	1,159.4
Burford Holdings Plc	35.1	17.6	526.8
Peel Holdings	7.5	5.0	696.8
Bourne End Properties Plc	28.6	12.8	169.6
Balanced Strategy			
Hammerson Plc	13.1	9.4	1,009.8
Warner Estate Holdings Plc	13.9	6.4	130.8
Barlows Plc	35.5	25.1	36.8
Income Strategy			
Slough Estates Plc	8.5	3.2	1,542.8
St Modwen Properties Plc	10.0	5.2	107.3

Table 2: The Perceived Portfolio Strategy and RBSA
Results for the Selected PLPCs.

4.   EFFECTIVE AND ACTUAL PORTFOLIO ALLOCATION

The results of an analysis of the data can be expressed in many ways including style attribute graphs, the R^2, the Sharpe's alpha and beta. The exposures associated with the factors in the RBSA present the effective portfolio allocation style of PLPCs as exemplified in Figure 2, which illustrates a style exposure area graph for three selected PLPCs.

The style exposure area graph of all the selected PLPCs is relatively inconsistent. Results are shown from the first quarter of 1992 to the fourth quarter of 1998. Based on the graphs, the property portfolio allocation of each company seems to have changed dramatically within the period, but in reality, this was not so. The style exposure for MEPC Plc changed from industrial to office sector and latterly changed to retail sectors. This also occurred with Burford Holdings Plc and Warner Estate Holdings Plc, which suggests a number of possible reasons. Firstly, property portfolio decisions are usually based on the general policies or objectives of the company and such objectives may supercede return

considerations. For example, Slough Estates Plc maintained the emphasis on industrial and business spaces disregarding the changes of the sectors' performance.

The second reason is the appropriateness of factors used to estimate the style exposure. This study concentrates on three commercial property types, which were obtained from the IPD to give the explanation of the property returns movement. However, the PLPCs' returns are based on stock returns that are clearly expressing the dissimilarity of the data.

The results of the Sharpe's alpha, beta and R^2 that derived from the RBSA are shown in Table 3. Additional information shown in Table 3 is the average gearing of the PLPCs obtained from the *Financial Times*. Gearing is the company's borrowing as a percentage of shareholders' funds, which includes bank loans but not other obligations such as trade creditors, finance leases and hire purchase contracts and other creditors. A standard method has been used in the calculation of gearing.

(a)

(b)

(c)
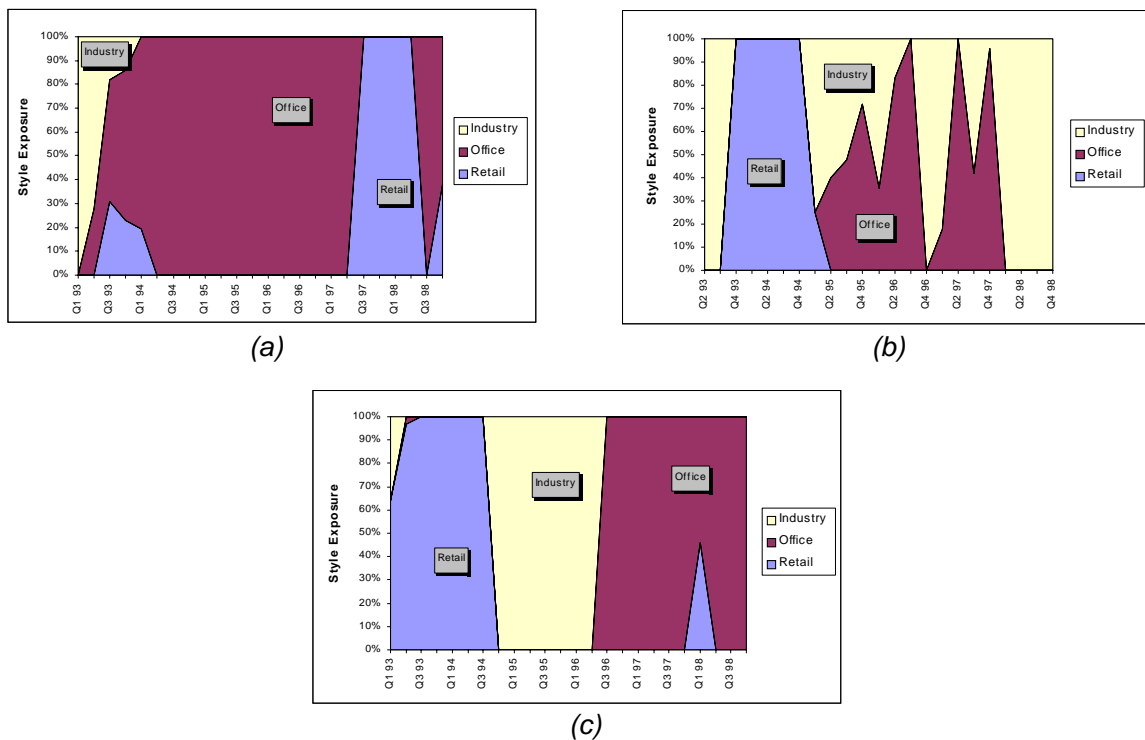
Figure 2: Style Exposure Area Graph of Selected PLPCs for the period 1993 to 1998.

   (a) MEPC Plc
   (b) Burford Holdings Plc
   (c) Warner Estate Holdings Plc

One of the most notable results shown in Table 3 is that the R^2 values are rather low. The highest is only 23.63 per cent (Great Portland Plc) and the lowest is 9.77 per cent (St Modwen Properties Plc). Most of the previous studies have taken a slightly different approach. Sharpe (1992) examined the portfolio allocation of mutual funds, in which the asset classes, such as bills, bonds and stocks, were within the capital market. Other studies have been on the same basis (diBartolomeo and Witkowski, 1997; Lobosco and diBartolomeo, 1997; Liang and McIntosh, 1998; Lee, 1999). However, our study deals with the property company's share prices and IPD data as a property index to explain the returns of asset classes. Therefore, a low R^2 is not unexpected and not a weakness of the study. It has been observed that property portfolios generally have higher levels of unsystematic risk

than stock or bond portfolios (Myer and Webb, 1996). A study by Myer and Webb (1996) aimed at determining an effective portfolio allocation of property funds in the US was, on the other hand, based on the returns of property types. It also found that the R^2 values were considerably lower than in those studies by Sharpe (1992), Liang and McIntosh (1998), and Lee (1999). The analysis has reviewed very valuable information about the portfolio allocation of the property companies. *It has shown the uniqueness of the property portfolio and indicated that the return of property companies gives little determination to property portfolio construction.*

Property Company	Average Sharpe's Alpha (% per annum)	Std Dev[3] of Sharpe's Alpha	Average R^2 (%)	Average Beta (% per annum)	Std Dev of Beta	Average Gearing (%)
Growth Strategy						
MEPC Plc	3.3	6.8	20.46	1.2	0.3	71.1
Great Portland Estates Plc	2.3	8.1	23.63	1.1	0.2	69.8
Burford Holdings Plc	27.7	9.0	19.29	0.6	0.3	77.4
Peel Holdings	13.8	18.5	15.87	1.2	0.3	123.7
Bourne End Properties Plc	15.5	14.1	12.71	0.5	1.1	255.9
Balanced Strategy						
Hammerson Plc	3.0	7.5	16.75	1.4	0.5	59.7
Warner Estate Holdings Plc	5.5	4.1	15.39	1.3	0.2	45.8
Barlows Plc	16.8	12.0	11.79	1.3	0.8	93.6
Income Strategy						
Slough Estates Plc	7.3	9.7	16.87	1.5	0.4	66.5
St Modwen Properties Plc	22.4	15.4	9.77	2.0	0.9	83.7

Table 3: RBSA Results for the Selected PLPCs.

Figures 3, 4 and 5 allow a comparison of the average RBSA's effective allocation and the actual allocation for *growth*, *balanced* and *income* portfolio strategy companies respectively. MEPC Plc, Slough Estates Plc, Burford Holdings Plc, Peel Holdings Plc and Bourne End Properties Plc have been categorised as *growth* companies. Hammerson Plc, Warner Estates Plc and Barlows Plc have *balanced* strategies, while Great Portland Plc and St Modwen Plc are companies with *income* strategies. The general finding deduces that the RBSA of companies with *growth* and *income* strategies have effective portfolio allocations, which conform considerably well to their actual allocation and the R^2s are relatively higher. Most of them are large companies with market capitalisation more than £250 million, while St Modwen Properties Plc and Bourne End Properties are a medium-size and small company respectively (as described in Appendix A).

Another discernible aspect of the results is that the gearing levels of the growth companies are much higher than in the other two categories. An increase in the gearing level should increase the risk and return of the company. Market risk or beta is always an indicator of the stock's risk that cannot be avoided by diversification. The *growth* companies are expected to have a higher beta, as higher gearing will increase the volatility of the returns. However, this is not the case, as the average betas of the *growth* companies are lower than the others. The results are supported by the study by Chan *et al.* (1990) which suggested that there was no significant difference in the average return of REITs with different levels of borrowing. This is also the case with the volatility of returns. It also implies that the borrowing factor is an important element that can maximise the wealth of the property companies. The gearing of growth companies indicates that the optimum gearing level should be in the region of 70 to 100 per cent. In fact, a company may be considered to be a lowly geared if gearing is less than 100 per cent (Vaitilingam, 1996). Bourne End Properties Plc is an exceptional

case. Besides the company being classified as a small company, the average gearing is more than 200 per cent, which means it can be considered a very highly geared company. Although the average beta is only 0.5, the standard deviation of the beta is high, as the highest and the lowest beta of the company are -1.0 and 2.2 respectively. Bourne End Properties Plc is still trying to stabilise its property business and the management team might appear to be making an ambitious attempt to become one of the leading property companies in the U.K.
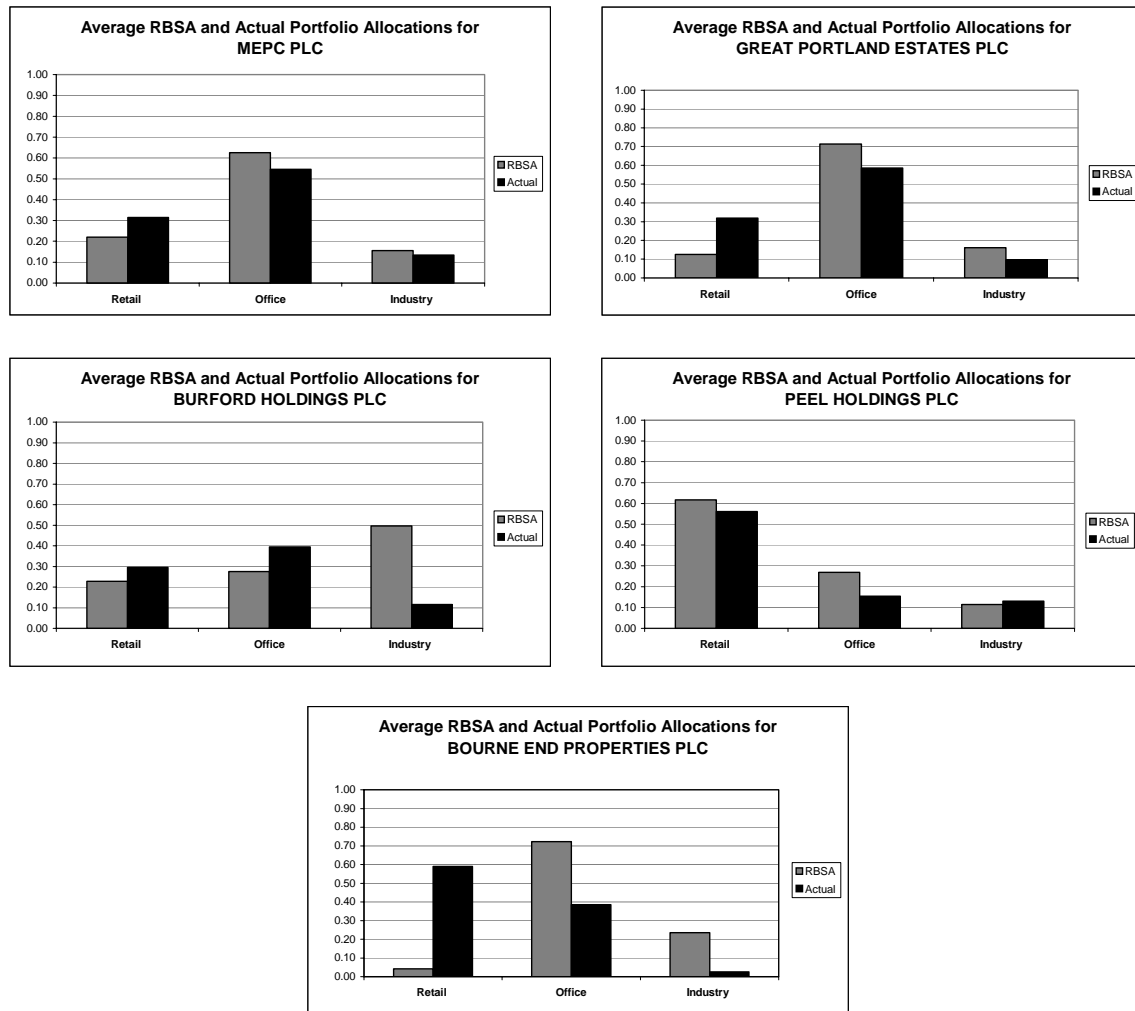
Figure 3: PLPCs with Growth Strategy for the period 1993 to 1998.
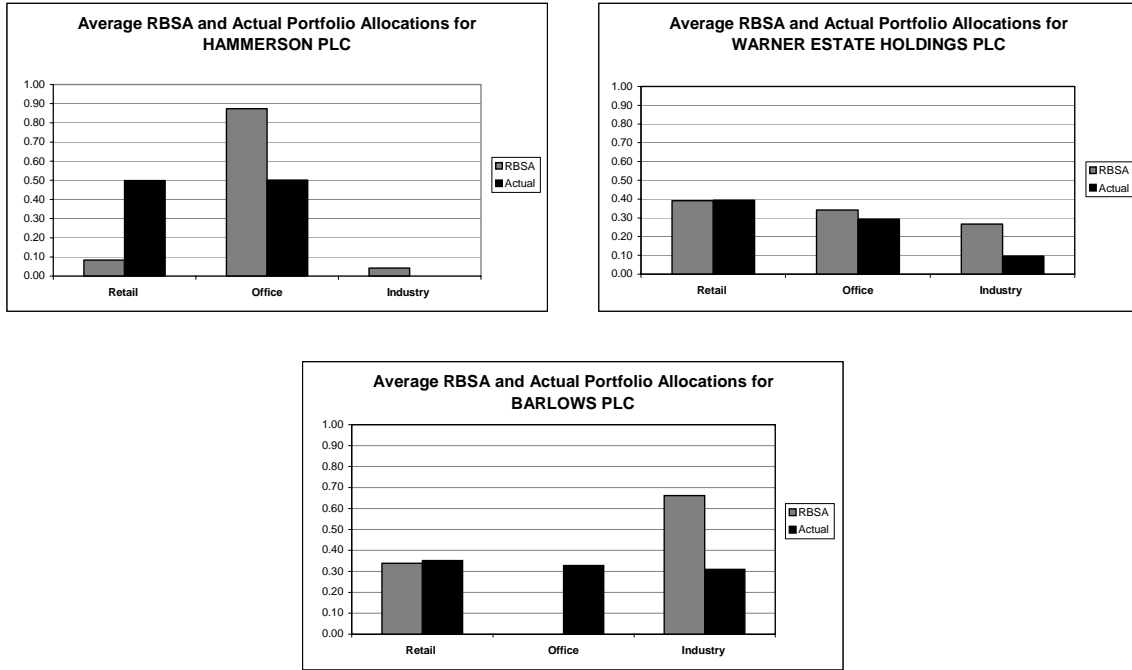
Figure 4: PLPCs with Balanced Strategy for the period 1993 to 1998.
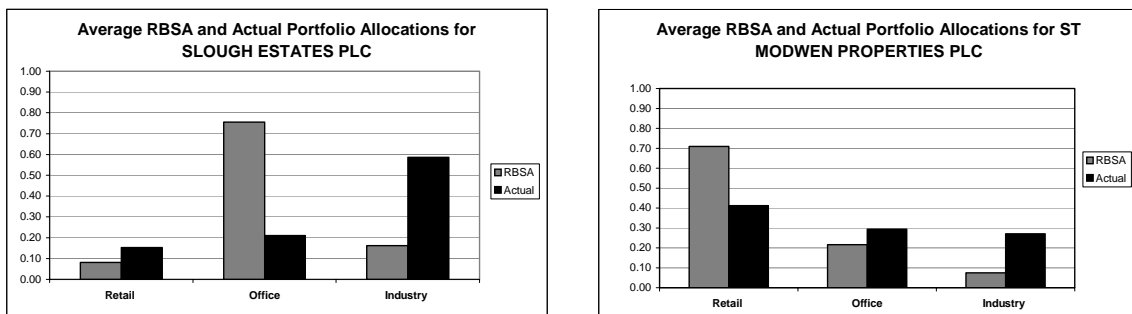

Figure 5: PLPCs with Income Strategy for the period 1993 to 1998.

All the companies have a positive Sharpe's alpha, indicating that they performed quite well. The effective portfolio allocations for *balanced* companies are less easy to explain, with the possible exception of Warner Estates Plc. Hammerson Plc and Barlows Plc have attempted to balance their portfolios in order to reduce the risk. However, changes in commercial property returns within the period have made some impact on the style exposure of both companies. Companies like Burford Plc and Peel Holdings have managed to respond to property market conditions and, consequently, they performed very well and had an explainable portfolio allocation.

Besides the general findings, a number of companies have specific unique features. Great Portland Plc, which had the highest R^2, maintained their portfolio strategy. The main reason stems from their decision to maintain the portfolio in London in order to secure a higher level of return. The effective allocation of Slough Estates Plc is quite difficult to explain compared with the actual portfolio, as the main aspect of portfolio allocation suggested by RBSA is *office*. Contrarily, most of the actual portfolio allocation is *industrial*. They seem to prefer to maintain the emphasis on industrial and business spaces although industrial property returns have decreased for the last few years.

5.   CONCLUSION

Investment decision-making in property has traditionally been based upon intuitive judgement supported by the experiences of property managers and other comparable property investments. This is supported by the low R^2, to indicate that the impact of property performance is not particularly significant in the selection of portfolio allocation. Generally, property performance seems to have less significance in explaining the style allocation of the PLPCs. Although financial and property investment theories have become closer over the last few decades, there is still a gap between the return of real property and other assets such as stocks and bonds. Property investment decision-making still requires intuitive judgements, as most of the characteristics of real property itself are unchangeable. However, it does not mean that property performance is unable to explain the implicit element in property investment decision making. In fact, this study has revealed that RBSA is capable of determining the style allocation of the selected PLPCs. Nevertheless, consideration of other factors is inevitable. These may include gearing, the features of the property portfolio and the property market cycle. Most other sectors and asset classes may require a considerably lower gearing level in order to strengthen the fundamental value of the company. On the other hand, the gearing factor is important in property business as it involves a large amount of capital.

Using the sample of ten PLPCs in U.K., the results show the effectiveness of RBSA. This is not only in terms of the asset allocation diagrams. The most important aspect is the contiguity of property performance and other portfolio allocation determinants within the portfolio strategy framework. Property portfolio strategy is one of the important elements that should be considered in portfolio selection that can influence the objectives and activities of the property companies.

RBSA has proved to be a reliable tool in the exploration of the relationship between portfolio strategy and portfolio performance. It has also been accepted as a powerful and implementable alternative for those wishing to create a benchmark for portfolio allocation decisions. However, the inadequacy of property returns information may restrict the wider use of RBSA as more details of property indexes are needed for future research. Property investment decisions are not merely dependent on the property types. The application of RBSA might be more meaningful if additional property information, such as that provided by regional property indexes, can be obtained.

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APPENDIX A: Sharpe's Alpha, R^2 and Beta of Selected PLPC in the U.K. in accordance with the Size of Market Capitalisation (MC) as at 31st June 1998

PROPERTY COMPANY	Sharpe's Alpha (% Per annum)				R^2 (%) of RBSA				BETA			
	Ave	Min	Max	SD	Ave	Min	Max	SD	Ave	Min	Max	SD
LARGE COMPANY (MC > £250 mil)												
MEPC	3.346	-15.820	10.539	6.753	20.46	11.26	29.42	4.84	1.167	0.743	1.730	0.257
Slough Estate	7.313	-22.389	23.811	9.726	16.87	10.83	29.99	4.13	1.491	0.833	2.242	0.412
Hammerson	2.979	-21.400	18.159	7.509	16.75	12.16	28.83	3.30	1.431	0.726	2.430	0.503
Great Portland Estates	2.322	-18.349	12.513	8.097	23.63	17.16	31.54	2.81	1.118	0.715	1.519	0.233
Burford Holdings	27.693	10.263	38.899	8.958	19.29	11.15	26.95	4.37	0.643	-0.202	0.935	0.270
Peel Holdings	13.783	-21.025	36.588	18.470	15.87	8.34	20.42	3.13	1.168	0.601	1.720	0.303
MEDIUM SIZE COMPANY (£50m > MC > £250m)												
Warner Estate Holdings	5.549	-5.823	12.883	4.054	15.39	4.09	30.71	8.81	1.315	0.905	1.633	0.215
St. Modwen	22.423	-17.520	37.686	15.428	9.77	3.37	22.46	4.20	1.977	0.315	2.860	0.887
SMALL COMPANY (MC < £50 mil)												
Bourne End Properties	15.462	-18.623	38.647	14.122	12.71	10.24	14.90	1.43	0.538	-0.950	2.209	1.082
Barlows	16.786	2.859	37.245	11.969	11.79	4.09	17.97	4.79	1.312	0.182	2.440	0.759

Notes

[1] ε_A denotes the mean error from equation (1) and it is called Sharpe's alpha. It measures the performance of PLPCs according to the effective allocation of the RBSA model.

[2] In this context, historic return is the actual return of the company based on its share price movement.

[3] Standard deviation.