FINANCIAL SERVICES REVIEW

Financial Services Review 16 (2007) 261–273

Original article

Real estate mutual funds: a style analysis

Crystal Yan Lin, PhD,[a,*] Kenneth Yung, PhD[b]

[a]*Department of Finance, Eastern Illinois University, School of Business, Charleston, IL 61920, USA*
[b]*Department of Finance, Old Dominion University, College of Business & Public Administration, Norfolk, VA 23529, USA*

Abstract

We find that the characteristics of real estate related securities are different from those of the general common equities. To help investors understand better the products offered by real estate mutual funds, we develop style descriptors that are specifically created for real estate related securities. Among the universe of real estate securities, we find real estate funds tilt toward large stocks and favor growth moderately over value. Growth managers outperform value mangers in this sector by 1.51% to 2.30% per year. However, there is evidence of shifts in the investment style among the funds. Our results help investors in evaluating real estate fund performance and making better asset allocation decisions.

Jel classifications: G11; G12

Keywords: Mutual fund performance; Style investment; Real estate mutual fund

1. Introduction

Over $8.1 trillion are currently managed by the U.S. mutual fund industry.[1] A significant portion of this amount is actively managed by professional investment managers who presumably rely on superior stock selection skills to outperform passive strategies. The bewildering variety of approaches followed by investment managers very often makes it difficult for investors to choose funds that are suitable. The institutional investment community has responded to the proliferation of investment methods by scrutinizing more closely an investment manager's investment style. The attention to investment style has

* Corresponding author. Tel.: +1-217-581-2227; fax: +1-217-581-6247.
E-mail address: cylin@eiu.edu (C.Y. Lin).

1057-0810/07/$ – see front matter

several benefits. Among them, accounting for style helps performance evaluation by giving a clearer picture of a manager's stock selection skill. For example, the manager of a portfolio of large stocks may appear disappointed relative to a broad market index, but performance may be outstanding relative to a large stock benchmark. In addition, style-investing appeals to investors as it gives them a convenient framework with which to organize their investment strategies. Essentially, in style investing, investors group assets into different asset classes referred to as styles and move money into and out of these styles. According to Jeremy Siegel, style investing refers to "rotate between small and large and value and growth stocks' (Siegel, 1998).

In addition to the extensive studies on mutual fund performance, in recent years financial economists have also examined mutual fund investment styles. Brown and Goetzmann (1997) and Carhart (1997) find that size and value help explain the differences in fund performance. Chan, Chen and Lakonishok (2002) use the Fama-French factors as style indices and find mutual funds adopt investment styles that tend to cluster around a broad market benchmark, and the few funds that deviate from the index are more likely to favor growth stocks and past winners. Barberis and Shleifer (2003) show how funds' pursuit of styles can account for observed patterns in stock returns. On the profitability of style momentum strategies, Moskowitz and Grinblatt (1999) and Asness, Liew and Stevens (1997) successfully apply momentum strategies to industry portfolios and country portfolios, respectively. Lewellen (2002) reports that momentum strategies based on size and book-to-market portfolios are at least as profitable as individual stock momentum. Chen and De Bondt (2004) find evidence of style momentum within the S&P 500 index.

Extant studies on mutual funds have typically focused on general equity funds. To our knowledge, there are very few published articles on real estate mutual funds and none has examined specifically the issue of real estate mutual fund investment styles. O'Neal and Page (2000) study the performance of 28 real estate mutual funds over a three-year period from 1996 to 1998. Their results show that real estate mutual funds do not offer positive abnormal performance relative to several broader equity market indices. Lin and Yung (2004), using a larger sample and a longer sample period, report that real estate mutual fund performance is largely tied to that of the real estate industry. They also conclude that factors such as size, book-to-market, and momentum are immaterial after accounting for the real estate market factor (NAREIT index). Though Gallo, Lockwood and Rutherford (2000) consider investment styles of real estate mutual funds, they define investment style according to the types of investment properties held.

In this study, we add to the literature by specifically examining the investment styles of real estate mutual funds using style descriptors created for real estate related securities. Damodaran and Liu (1993) and Kallberg, Liu and Trzcinka (2000) have suggested that money managers investing in the real estate sector could produce positive abnormal returns because of their specific appraisal skills and information. An investigation of the investment styles of real estate funds hence will give us a clearer picture of a manager's selection skill in the sector. In addition, such an understanding would benefit investors who are more interested in indirect real estate investments than direct real estate ownerships. In this study, we use style descriptors that are similar to the Fama-French factors (SMB and HML) for evaluating the styles of real estate funds. An advantage of this approach is that it is consistent

with the 'large or small' and 'value or growth' rotations in Wall Street as described by Jeremy Siegel. Moreover, Chan et al. (2002) have shown that the Fama-French factors perform very well as style descriptors relative to other style classification schemes. A significant difference between our study and the others is that we create the style descriptors using only real estate related common stocks. We believe this is more appropriate given that real estate mutual funds invest primarily in real estate related assets. When a real estate fund manager ponders the question 'large versus small' or 'value versus growth,' the reference is more likely the universe of real estate related assets instead of the entire population of common stocks. In addition, researchers have found that the risk characteristics of real estate securities are different from those of general common equities (Reilly & Brown 2000). Thus, using the conventional Fama-French factors directly will give a biased analysis.

Our results show that the style descriptors specifically created for real estate related securities perform well in understanding the investment styles of real estate mutual funds. Among the universe of real estate securities, we find real estate funds tilt toward large stocks on average. In addition, there is a moderate tendency to prefer growth to value stocks. On average, growth managers outperform value mangers in this sector by 1.51% to 2.30% per year. We also find evidence that fund managers, especially those among the losers, shift their investment styles. Taken together there is little evidence that real estate fund managers are able to time the style factors. Our investigations help us understand better the products offered by real estate funds and the performance evaluation of fund managers. It helps particularly in asset allocation decisions as shifts in investment style of real estate funds represent disruptions to investor's overall portfolio characteristics. Our concern regarding a better understanding of the investment style of real estate mutual funds echoes that of Detzel (2006) in that he also finds it necessary for mutual fund investors to be able to readily identify each fund's equity class in their investment decisions. In addition, Kadiyala (2004) points out the importance of understanding the determinants of mutual fund performance in making asset allocation decisions.

2. Data

Our sample period starts from January 1, 1997 and ends on December 31, 2004. The sample covers all real estate mutual funds with at least 24 months of daily return data. Daily data are obtained from Morningstar, Inc. Monthly returns are used in the analysis, which is calculated from compounding daily returns. Fund characteristics data such as net assets, expense ratio, and turnover are obtained from the respective fund prospectus. Table 1 provides selected descriptive statistics of the funds. The 1990s represents one of the fastest growing periods for the mutual fund industry, with the size of managed assets achieving an annual growth rate in excess of 19%. During this period, real estate mutual funds grew faster than the fund industry as a whole, achieving a 44% growth per annum. The share of real estate mutual funds in the industry grew from 0.05% in 1993 to about 0.30% in 2004 (source: Investment Companies Yearbook). The mean expense ratio (1.50% to 1.98%) over the study period appears high relative to the industry (1.17% to 1.20%).[2] This is consistent with the implications of Damodaran and Liu (1993) and Kallberg, Liu and Trzcinka (2000) that

Table 1 Sample descriptive statistics

Panel A: Net assets (millions)

	1997	1998	1999	2000	2001	2002	2003	2004
Mean	183.70	159.19	93.08	98.51	109.05	128.76	131.77	108.07
Median	53.31	32.26	19.80	22.21	21.50	25.88	36.24	52.06
Maximum	3433.00	2480.00	1465.00	1309.00	1387.10	1270.00	1681.30	550.18
Minimum	2.11	0.00	0.00	0.00	0.00	0.95	0.92	1.26
SD	592.06	426.17	234.05	215.72	238.68	270.71	267.78	135.80

Panel B: Expense ratio (%)

	1997	1998	1999	2000	2001	2002	2003	2004
Mean	1.52	1.50	1.74	1.78	1.78	1.86	1.98	1.79
Median	1.25	1.36	1.66	1.71	1.59	1.71	1.74	1.76
Maximum	3.49	2.60	4.18	4.14	5.24	4.57	4.85	2.92
Minimum	0.48	0.24	0.26	0.33	0.33	0.28	0.69	0.52
SD	0.66	0.58	0.77	0.76	0.91	0.88	0.91	0.62

Panel C: Turnover (%)

	1997	1998	1999	2000	2001	2002	2003	2004
Mean	71.18	53.72	42.26	65.70	66.93	72.19	58.97	42.00
Median	57.00	42.58	38.00	39.00	42.75	47.00	45.55	27.34
Maximum	205.00	196.00	198.00	482.00	274.00	327.00	213.45	158.00
Minimum	8.40	2.00	2.52	7.00	5.00	6.00	13.11	13.00
SD	56.56	45.95	30.05	89.46	61.44	65.47	51.76	34.99

Panel D: Annual fund return (%)

	1997	1998	1999	2000	2001	2002	2003	2004
Mean	4.86	−25.52	−12.34	13.85	−0.15	−3.86	28.13	14.68
Median	4.48	−25.63	−12.97	15.17	−1.34	−4.23	27.17	15.32
Maximum	22.99	−3.41	20.12	21.59	18.95	14.70	77.10	23.14
Minimum	−11.43	−39.59	−22.20	−7.81	−13.97	−20.11	−38.85	−1.60
SD	7.60	5.86	5.27	5.49	5.52	4.73	9.80	4.13
Observations	24	49	69	87	103	126	141	141
S&P500	33.36	28.58	21.04	−9.1	−11.89	−22.1	28.69	10.88

Fund characteristics data (net assets, expense ratio, and turnover) is obtained from the respective fund prospectus. Fund return data is from Morningstar, Inc.

investment managers in this sector require specific appraisal skills and information. A quick comparison between the annual returns of the real estate funds and the S&P 500 shows a pattern that is consistent with the general observation that real estate investments have low or negative correlations with the stock market (Goetzmann & Ibbotson 1990). In fact, we have found a correlation coefficient of −0.04, and that supports the general argument that real estate investment could be a good defensive play for portfolio risk diversification.

3. The Style Descriptors

We follow the method of Fama and French (1993) in constructing our style descriptors. At the end of each year, all real estate related stocks with SIC codes 15, 16, 17, 65, and 6798 are ranked on size (price time shares). The median size is then used to split the stocks into two groups, small and large (S and B). We also break the stocks into three book-to-market equity groups based on the breakpoints for the bottom 30% (Low), middle 40% (Medium), and top 30% (High) of the ranked ME/BE values. Similar to Fama and French, the decision to sort firms into three groups on BE/ME and only two on ME follows the evidence in Fama and French (1992) that book-to-market ratio has a stronger role in average stock returns than size. We construct six portfolios (S/L, S/M, S/H, B/L, B/M, B/H) from the intersections of the two ME groups and the three BE/ME groups.[3] The portfolios are reformed every year. Our first style descriptor RESMB (small minus big among real estate related securities only) is meant to mimic the risk factor related to size. It is computed as the difference, each month, between the simple average of the returns on the three small-stock portfolios (S/L, S/M, and S/H) and the simple average of the returns on the three big-stock portfolios (B/L, B/M, and B/H). Thus, RESMB is the difference between the returns on small- and big-stock portfolios with about the same weighted-average book-to-market equity. This difference is therefore considerably free of the influence of BE/ME. Our second style descriptor REHML (high minus low among real estate related securities only) is meant to mimic the risk factor in returns related to book-to-market equity. REHML is the difference, each month, between the simple average of the returns on the two high-BE/ME portfolios (S/H and B/H) and the simple average of the returns on the two low-BE/ME portfolios (S/L and B/L). Thus, REHML is the difference between the returns on high- and low-BE/ME portfolios with about the same weighted-average size. This difference is, therefore, largely free of the influence of the size factor in returns. In addition, our proxy for the market factor in stock returns is the excess market return; RERM-RF. RERM is the return on the value-weighted portfolio of all the real estate related stocks in the six size-BE/ME portfolios.

Table 2 reports selected descriptive statistics for the six real estate related stock portfolios. The portfolio S/H has the most stocks. The large number of small stocks with high BE/ME is consistent with the findings of Wang, Erickson, Gau and Chan (1995) that real estate related securities are relatively less well researched. Throughout the study period, portfolio B/H consistently has the least number of stocks. It appears likely that large real estate related stocks are more followed and hence more efficiently priced. The range of mean BE/ME ratio (1.03 to 2.07) is considerably higher than the 29-year average (0.30 to 1.80) of all the NYSE-AMEX-NASDAQ stocks reported in Fama and French (1993). This again could imply real estate related securities are priced differently in the market. The median size of real estate firms over the study period ranges from US$ 211 million to US$588 million. On average, the size of real estate firms is much smaller than that of all the NYSE-AMEX-NASDAQ firms. Table 2 clearly points out that characteristics of real estate related securities are very different from those of the NYSE-AMEX-NASDAQ universe. We consider this a strong support for using our specifically created real estate related style descriptors, RESMB, REHML, and RERM.

In Table 3, we report descriptive statistics of our real estate securities style descriptors

Table 2 Descriptive statistics of stocks used to construct real estate factors

Panel A: Number of stocks in the portfolios

Year-end	Number of stocks in portfolio						
	S/L	S/M	S/H	B/L	B/M	B/H	Total
1996	24	21	48	38	40	14	185
1997	34	28	54	43	49	23	231
1998	35	29	68	53	58	20	263
1999	31	30	66	54	54	19	254
2000	19	38	71	66	47	14	255
2001	21	33	65	58	47	14	238
2002	24	29	62	52	49	14	230
2003	23	35	61	56	45	18	238

Panel B: Descriptive statistics for stocks in factor portfolios

Year-end	Size ($ millions)			BE/ME		
	Mean	Median	SD	Mean	Median	SD
1996	402.6	211.6	504.5	2.07	0.64	8.06
1997	577.2	343.7	734.4	1.53	0.67	5.16
1998	581.4	297.1	795.7	1.77	0.83	5.41
1999	572.4	254.0	848.3	1.58	1.00	3.48
2000	703.3	238.2	1,300.1	1.49	0.88	3.51
2001	810.2	331.1	1,285.9	1.65	0.76	4.05
2002	801.1	369.2	1,247.8	1.52	0.80	4.05
2003	1,206.4	588.3	1,687.9	1.03	0.61	2.78

Note: At the end of each year, we sort stocks with SIC codes 15, 16, 17, 65, and 6798 by their market capitalization and book-to-market ratio. Six portfolios are constructed: S/L, small-growth; S/M, small-neutral; S/H, small-value; B/L, big-growth; B/M, big-neutral; B/H, big-value. The monthly returns of these six portfolios in the following year are used to construct size and book-to-market factors.

versus those of the conventional Fama-French factors (RMRF, SMB, and HML). Over the study period, our real estate related size descriptor RESMB has a mean (median) that is much higher than the Fama-French SMB. The median of RESMB is 0.703 while that of the

Table 3 Descriptive statistics for real estate factors

	RERMRF	RESMB	REHML	RMRF	SMB	HML
Mean	0.721	0.488	0.324	0.430	0.386	0.428
Median	0.653	0.703	−0.106	1.415	0.310	0.625
Maximum	10.005	6.658	13.847	8.180	22.090	13.740
Minimum	−11.735	−8.500	−13.564	−16.200	−16.780	−13.200
SD	3.769	2.706	4.030	5.306	4.958	4.587
Skewness	−0.406	−0.554	−0.234	−0.609	0.691	−0.009
Kurtosis	3.676	4.076	6.035	2.881	7.502	4.000

Note: Descriptive statistics for market, size, and book-to-market factors. RMRF, SMB, and HML are Fama-French excess market return, small minus big, and high minus low return series. RERMRF, RESMB, and REHML are excess real estate market return, real estate small minus big, and real estate high minus low return series. Sample period is from January 1997 through December 2004.

conventional SMB is 0.310. The considerably larger small-stock premium among real estate related securities implies a heightened market inefficiency in the sector because of firm size. The source of the inefficiency could be related to the difficulties in analyzing the assets and/or lack of analyst coverage, a recurring observation among published research in real estate. The real estate securities value descriptor REHML, on the other hand, is smaller than that of the Fama-French HML. The mean (median) of REHML is 0.324 (−0.106) whereas the mean (median) of the conventional HML is 0.428 (0.625). The REHML has a higher degree of negative skewness, causing the median negative. The large differences between real estate descriptors (RESMB, REHML) and the Fama-French factors (SMB, HML) confirm our earlier conjecture that investment styles of real estate mutual funds cannot be appropriately described by conventional factors. Risk characteristics are quite different in the real state sector.

4. Real Estate Mutual Fund Factor Exposures

At the end of each year over the study period the following model is estimated for each real estate mutual fund that has a complete history of returns over the prior 24 months:

$$r_{it} - r_{ft} = \alpha_i + \beta_{1i}[r_{remt} - r_{ft}] + \beta_{2i}RESMB_t + \beta_{3i}REHML_t + \varepsilon_{it} \quad (1)$$

r_{it} is the return in month t for fund i, r_{ft} is the return on a one-month Treasury Bill, r_{remt} is the return on the value-weighted portfolio of real estate stocks with SIC code 15, 16, 17, 65, and 6798, and $RESMB_t$, $REHML_t$ are the returns on zero-investment factor-mimicking portfolios for size and book-to-market. The estimates of β_{2i} and β_{3i} measure fund i's orientation toward firm size and book-to-market. A positive (negative) β_{2i} means the fund is oriented toward small (large) real estate securities. A positive (negative) β_{3i} means the fund is tilted toward value (growth) real estate stocks.

We report the regression results in Table 4. Panel A gives the distribution of funds' factor loadings. Funds are assigned to quintile portfolios based on the estimated coefficients from the model. Within each quintile, the equal-weighted average of the coefficients is calculated. Then the weighted averages over all the years of the coefficients are reported in Panel A. For comparison purpose, Panel B reports the loadings on the NAREIT index return and four of our earlier created factor portfolios S/L (small-growth), S/H (small-value), B/L (big-growth), and B/H (big-value). Regarding size orientation, the results show that most funds are tilted (4 out of 5 quintiles have negative β_{2i}) toward large real estate stocks. A likely reason is that real estate firms are on average relatively small (see Table 2) and institutional funds have minimum size requirements regarding their investment targets. The NAREIT index has an average sensitivity to the size factor of −0.199. Only two quintiles of real estate funds have sensitivities above this value.

With respect to the value-growth orientation, it appears that real estate funds on average moderately favor growth over value real estate securities. Three quintiles have negative coefficients of β_3.On the other hand, the NAREIT index has an average sensitivity to the REHML factor of 0.080. The tilt towards growth real estate stocks among mutual funds has been documented frequently in academic research. Some argue it could be because of

Table 4 Distribution of estimated factor loadings for mutual funds

Panel A: Distribution of factor loadings for real estate mutual funds

Loading on	1 (Low)	2	3	4	5 (high)
Market	0.639	0.752	0.792	0.838	1.020
Size	−0.398	−0.308	−0.238	−0.149	0.235
Book-to-market	−0.160	−0.057	−0.016	0.039	0.161

Panel B: Distribution of factor loadings for benchmark portfolios

Loading on	S/L	S/H	B/L	B/H	NAREIT
Market	0.975	1.017	1.035	0.992	0.871
Size	1.198	0.972	−0.019	0.207	−0.199
Book-to-market	−0.643	0.697	−0.165	0.495	0.080

Note: At the end of each year over the study period the following model is estimated for funds with a complete history of monthly returns over the prior 24 months: $r_{it} - r_{ft} = \alpha_i + \beta_{1i}[r_{remt} - r_{ft}] + \beta_{2i} RESMB_t + \beta_{3i} REHML_t + \varepsilon_{it}$. r_{it} is the return in month t for fund i, r_{ft} is the return on a one-month Treasury Bill, r_{remt} is the return on the value-weighted portfolio of stocks with SIC codes 15, 16, 17, 65, and 6798, and $RESMB_t$ $REHML_t$ are the returns on zero-investment factor-mimicking portfolios for real estate size and book-to-market, respectively. Funds are assigned to quintile portfolios based on the estimated coefficients from the model and the equal-weighted average coefficient across funds within a quintile is calculated. The numbers reported in Panel A are the weighted average across years, where the weights are the number of fund observations available in that year. Panel B reports the loadings on the NAREIT index return and our six factor portfolio returns: S/L, small-growth; S/H, small-value; B/L, big-growth; B/H, big-value. Sample period is from January 1997 through December 2004.

investment strategies, others suggest it is influenced by personal interests of the fund manager. In summary, we find real estate funds tilt toward large real estate stocks and moderately favor growth over value real estate securities. In results not detailed here, we find real estate funds are oriented toward small-value if we applied the conventional Fama-French factors in the regression. This proves that conventional Fama-French factors could lead to a biased analysis for real estate mutual funds.

5. Fund Style and Fund Performance

A major focus in the study of mutual funds is that of the fund performance. Starting with Jensen (1968), many studies claim that the net return provided by the average actively managed mutual fund is inferior to that of a comparable passive benchmark. Conflicting results, however, have been reported in the eighties and nineties. For example, Coggin and Trzcinka (1997) and Davis (2001) find growth-oriented funds are associated with higher alphas. Chen, Jegadeesh and Wermers (2000) also report that growth-oriented funds exhibit better stock selection skills than income-oriented funds. Grinblatt and Titman (1989) find that the risk-adjusted gross returns of growth and aggressive growth funds are significantly positive.

Table 5 provides estimates of alphas and loadings for portfolios of real estate mutual funds that are sorted by size and book-to-market characteristics. At the end of each year over the

Table 5 Real estate mutual fund performance (percent per month) and loadings from three-factor models, classified by style

Rank on size	Loading on	Rank on book-to-market	
		Value	Growth
Large cap	Constant	−0.212	−0.018
	Market	0.865***	0.813***
	Size	−0.133**	−0.175***
	Book-to-market	0.081*	0.016
	Adjusted R-squared	0.862	0.858
Small cap	Constant	0.016	0.147
	Market	0.775***	0.782***
	Size	−0.311***	−0.322***
	Book-to-market	0.013	0.014
	Adjusted R-squared	0.814	0.819

Note: At the end of each year the following model is estimated for funds with a complete history of monthly returns over the prior 24 months: $r_{it} - r_{ft} = \alpha_i + \beta_{1i}[r_{remt} - r_{ft}] + \beta_{2i}RESMB_t + \beta_{3i}REHML_t + \varepsilon_{it}$. r_{it} is the return in month t for fund i, r_{ft} is the return on a one-month Treasury Bill, r_{remt} is the return on the value-weighted portfolio of stocks with SIC codes 15, 16, 17, 65 and 6798, and $RESMB_t$ $REHML_t$ are the returns on zero-investment factor-mimicking portfolios for real estate size and book-to-market, respectively. Funds are assigned to one of four portfolios by their factor loading's rank on size and book-to-market. The median is used to classify large and small, value and growth portfolios. Sample period is from January 1997 through December 2004.

***Significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

study period all real estate funds are sorted by their value-weighted average size rank and book-to-market characteristics and assigned to one of four portfolios. For each of the resulting portfolios, equally weighted returns are calculated over the subsequent 12 months, and the process is repeated. At the end of the sample period, our regression model is applied to the complete history of returns on each portfolio. Results in Table 5 shows that growth-oriented real estate fund managers perform better than value-oriented managers on a style-adjusted basis. The difference between the alphas of growth and value managers for large caps is 0.194% per month (2.33% per year). The difference between the alphas of growth and value managers for small caps is 0.131% per months (1.57% per year). This finding is consistent with those of Coggin and Trzcinka (1997) and Chen et al. (2000). It is also consistent with Damodaran and Liu (1993) and Kallberg et al. (2000) that money managers investing in the real estate sector could produce positive abnormal returns because of their specific appraisal skills and information. Value managers of real estate funds have on average either a negative alpha or an alpha that is near zero.

6. Style Shifts, Past Performance, and Market Timing

It is understandable that a fund manager may shift his investment style if past performance has been less than satisfactory. Peer pressure and remuneration concerns frequently provide

Table 6 Style shifts and past returns

Panel A: Fund style shifts and past performance: size classified

		Past 24 month return	Past SMB rank	Future SMB rank	Mean absolute difference	Past HML rank	Future HML rank	Mean absolute difference
Winners	Large cap	3.283	0.126	0.143	0.072	0.250	0.471	0.443
	Small cap	3.054	0.424	0.281	0.148	0.511	0.589	0.250
Losers	Large cap	−15.654	0.125	0.209	0.084	0.330	0.541	0.366
	Small cap	−9.822	0.293	0.258	0.045	0.281	0.586	0.426

Panel B: Fund style shifts and past performance: book-to-market classified

		Past 24 month return	Past SMB rank	Future SMB rank	Mean absolute difference	Past HML rank	Future HML rank	Mean absolute difference
Winners	Value	3.963	0.359	0.255	0.110	0.509	0.612	0.258
	Growth	1.841	0.171	0.193	0.080	0.199	0.467	0.356
Losers	Value	−11.402	0.273	0.250	0.072	0.417	0.609	0.359
	Growth	−13.115	0.211	0.218	0.082	0.189	0.506	0.438

Note: At the end of each year every fund with available data is sorted by past 24-month return. The top 25% performance funds are classified as winners, and the bottom 25% funds are classified as losers. These funds are classified as large cap versus small cap in Panel A (or value vs. growth in Panel B) at the same time by their loadings on the size factor and book-to-market factor. For each of these two by three portfolios, the simple average of the loadings on size or book-to-market factor is calculated. Data reported in Panel A and B is the average across all portfolio formation years that are weighted by the number of funds in each year. Sample period is from January 1997 through December 2004.

the needed impetus. To investigate the occurrence of shifts in investment style among real estate funds, we sort funds into portfolios based on a two-way within-group classification. The first sort is by a fund's past performance (the compounded return on the fund over the past two years), and the second sort (in two iterations) by fund size and book to market value. In the classification by past fund return, we classify the top 25% of funds with the highest past return as winners; and the bottom 25% as losers. Regarding size, the large caps include the top third of funds and the small caps are those among the bottom third. Similarly, value (growth) funds are those in the top (bottom) third regarding book-to-market. The average across all portfolio formation years is reported in Table 6. We then compare each group's current style with its future style in the subsequent year.

In Table 6, with the real estate mutual funds classified according to size (large cap vs. small caps), results in Panel A show that the mean absolute difference between past and future RESMB ranks across all categories are quite small and comparable. Only the winners among small caps have a mean absolute difference larger than 0.1. In other words, there is no clear pattern regarding the shift between large and small stocks among the real estate funds. On the other hand, the mean absolute difference with respect to book-to-market (REHML) is large across all the categories of funds. The mean absolute difference for style ranks with respect to book-to-market is 0.433 (0.250) for large-cap (small-cap) funds with good past performance, compared with 0.366 (0.426) for large-cap (small-cap) funds with poor past performance. The losers, as a whole group, have higher mean absolute difference

Table 7 Style timing

Independent variables									
Constant		$[r_{remt} - r_{ft}]$		RESMB	REHML	$[r_{remt} - r_{ft}]+$	RESMB+	REHML+	Adjusted R^2
−1.001	***	0.802	***	−0.219	0.075	0.123	0.137	−0.132	0.840
(−3.023)		(9.532)		(−1.632)	(0.934)	(0.886)	(0.592)	(−0.940)	

Note: We formed an equal-weighted portfolio for all real estate mutual funds with available data in each month over the study period. The following regression is estimated:

$r_{pt} - r_{ft} = \alpha_p + \beta_{1p}[r_{remt} - r_{ft}] + \beta_{2p}RESMB_t + \beta_{3p}REHML_t + \beta_{4p}\max(0,r_{remt} - r_{ft}) + \beta_{5p}\max(0,RESMB_t) + \beta_{6p}\max(0,REHML_t) + \varepsilon_{pt}$.

r_{pt} is the return in month t for portfolio p, r_{ft} is the return on a one-month Treasury Bill, r_{remt} is the return on the value-weighted portfolio of stocks with SIC codes 15, 16, 17, 65, and 6798, and $RESMB_t$ $REHML_t$ are the returns on zero-investment factor-mimicking portfolios for real estate size and book-to-market, respectively. $[r_{remt} - r_{ft}]+$, *RESMB*+, and *REHML*+ are defined to be max (0, $[r_{remt} - r_{ft}]$), max (0, *RESMB*), and max (0, *REHML*), respectively. *t*-statistics are reported in parentheses. Sample period is from January 1997 through December 2004.

with respect to book-to-market than the winners. That is, losers are more likely to shift their investment style. Another observation is that small-cap funds with poor past performance have more pronounced shifts in investment style regarding book-to-market.

When funds are classified according to book-to-market (value vs. growth), Panel B shows again notable shifts in investment style among the losers. Specifically, the losers (both the value and growth funds) have higher mean absolute difference for style ranks with respect to book-to-market than the winners. The mean absolute difference for style ranks with respect to book-to-market is 0.359 (0.438) for value (growth) funds with poor past performance, compared with 0.258 (0.356) for value (growth) funds with good past performance. The shift in style ranks with respect to size (RESMB), however, is small and comparable between losers and winners. In summary, the results in Table 6 show that when performance has been poor, the fund manager is likely to make a change regarding the investment strategy. The shift could have been a temporary attempt to cover earlier losses, or it could be a rotation simply because of the cyclical nature of the real estate industry. However, from an investor's perspective, such style changes by poorly performing funds represent disruptions to the investor's overall portfolio structure.

A change in investment style may represent a manager's attempt to take advantage of short-term market movements. Extant literature, however, reports little evidence of market timing by mutual funds (e.g., Connor & Korajczyk, 1991; Ferson & Schadt, 1996; Chan et al., 2002).

To investigate market timing by real estate funds, we follow Henriksson and Merton (1981) in using the following regression: (2)

$$r_{pt} - r_{ft} = \alpha_p + \beta_{1p}[r_{remt} - r_{ft}] + \beta_{2p}RESMB_t + \beta_{3p}REHML_t + \beta_{4p}\max(0,r_{remt} - r_{ft}) + \beta_{5p}\max(0,RESMB_t) + \beta_{6p}\max(0,REHML_t) + \varepsilon_{pt} \quad (2)$$

Coefficients β_4, β_5, and β_6 estimate a fund's market timing effects. Based on results in Table 7, we can say that real estate funds do not have market-timing ability given that all the

coefficients of β_4, β_5, and β_6 are insignificant. This finding is consistent with results in existing literature.

7. Conclusions

One of the most important developments in active equity management in the last decade has been the creation of portfolio strategies based on value- and growth-oriented investment styles. It is now common for money mangers to describe themselves as "value stock mangers" or "growth stock managers" when selling their services to clients. Academic study of style investing, however, has been at its incipient stages only. In this study, we investigate the investment styles of real estate mutual funds. We create two real estate related style descriptors, RESMB (size) and REHML (book-to-market), to measure a fund's inclination toward large versus small and value versus growth stocks. We create these style descriptors from real estate related stocks because we find the risk characteristics of real estate securities different from those of the NYSE-AMEX-NASDAQ universe. Existing literature reports that most mutual funds adopt styles that bunch around an overall market index, with few funds taking extreme positions away from the index. Relative to the real estate market portfolio (NAREIT index), we find real estate funds on average tilt toward large real estate stocks and moderately favor growth over value real estate securities. We also find growth stock managers outperform value stock managers by 1.51% to 2.30% a year among real estate mutual funds. Growth stocks generally have a favorable history of past returns and hence may appear to be safer choices as far as managers' personal career risks are concerned. We also find evidence of shifts in investment style, especially among the losers. Taken together real estate funds do not appear to be able to time the style factors. Our analysis of real estate mutual fund investment styles provides insights regarding the kind of product offered. Our findings are useful for evaluating real estate mutual fund performance and also for controlling the risk of the investor's overall portfolio.

Notes

1. The 2004 year-end figure (source: Investment Company Institute, Washington, DC).
2. Source: Investment Company Institute, Washington, DC.
3. We have also performed analyses based on a 2X2 portfolio classification. Results are similar in general.

References

Asness, C., Liew, J., & Stevens, R.(1997). Parallels between the cross-sectional predictability of stock and country returns. *Journal of Portfolio Management, 23*, 79–87.

Barberis, N., & Shleifer, A.(2003). Style investing. *Journal of Financial Economics, 68*, 161–199.

Brown, J., & Goetzmann, W.(1997). Mutual fund styles. *Journal of Financial Economics, 43*, 373–399.

Carhart, M.(1997). On persistence in mutual fund performance. *Journal of Finance, 52*, 57–82.

Chan, L., Chen, H., & Lakonishok, J.(2002). On mutual fund investment styles. *Review of Financial Studies, 15,* 1407–1437.

Chen, H., & De Bondt, W.(2004). Style momentum within the S&P-500 index. *Journal of Empirical Finance, 11,* 483–507.

Chen, H., Jegadeesh, N., & Wermers, R.(2000). The value of active mutual fund management: an examination of the stockholdings and trades of fund managers. *Journal of Financial and Quantitative Analysis, 35,* 343–368.

Coggin, T., & Trzcinka, C. (1997). Analyzing the performance of equity managers: a note on value versus growth. In T.D. Coggins, FJ. Fabozzi, and R.D. Arnotts (Eds.), *The handbook of equity style management* (pp. 167–170). New Hope, PA: John Wiley.

Connor, G., & Korajczyk, R.(1991). The attributes, behavior and performance of U.S. mutual funds. *Review of Quantitative Finance and Accounting, 1,* 5–26.

Damodaran, A., & Liu, C.(1993). Insider trading as a signal of private information. *Review of Financial Studies, 6,* 79–119.

Davis, J.(2001). (2001). Mutual fund performance and manager style. *Financial Analysts Journal, 57,* 19–27.

Detzel, L.(2006). Determining a mutual fund's equity class. *Financial Services Review, 15,* 199–212.

Fama, E., & French, K.(1992). The cross-section of expected stock returns. *Journal of Finance, 47,* 427–465.

Fama, E., & French, K.(1993). Common risk factors in the returns on stock and bonds. *Journal of Financial Economics, 33,* 3–56.

Ferson, W., & Schadt, R.(1996). Measuring fund strategy and performance in changing economic conditions. *Journal of Finance, 51,* 425–461.

Gallo, J., Lockwood, L., & Rutherford, R.(2000). Asset allocation and the performance of real estate mutual funds. *Real Estate Economics, 28,* 165–184.

Goetzmann, W., & Ibbotson, R.(1990). The performance of real estate as an asset class. *Journal of Applied Corporate Finance, 3,* 65–76.

Grinblatt, M., & Titman, S.(1989). Mutual fund performance: an analysis of quarterly portfolio holdings. *Journal of Business, 62,* 393–416.

Henriksson, R., & Merton, R.(1981). On market timing and investment performance. *Journal of Business, 54,* 513–533.

Investment Companies Yearbook, various issues. Rockville, MD: CDA/Wiesenberger, Inc.

Jensen, M.(1968). The performance of mutual funds in the period 1945–1964. *Journal of Finance, 23,* 389–416.

Kadiyala, P.(2004). Asset allocation decisions of mutual fund investors. *Financial Services Review, 13,* 285–302.

Kallberg, J., Liu, C., & Trzcinka, C.(2000). The value added from investment managers: an examination of funds of REITs. *Journal of Financial and Quantitative Analysis, 35,* 387–408.

Lewellen, J.(2002). Momentum and autocorrelation in stock returns, *Review of Financial Studies, 15,* 533–563.

Lin, C., & Yung, K.(2004). Real estate mutual funds: performance and persistence. *Journal of Real Estate Research, 26,* 69–93.

Moskowitz, T., & Grinblatt, M. (1999). Do industries explain momentum? *Journal of Finance, 54,* 1249–1290.

O'Neal, E., & Page, D.(2000). Real estate mutual funds: abnormal performance and fund characteristics. *Journal of Real Estate Portfolio Management, 6,* 239–247.

Reilly, F., & Brown, B. (2000). *Investment analysis and portfolio management.* Mason, OH: Thomson South-Western.

Siegel, J. (1998). *Stocks for the long run.* New York: McGraw-Hill.

Wang, K., Erickson, J., Gau, G., & Chan, S.(1995). Market microstructure and real estate returns. *Real Estate Economics, 23,* 85–100.