Amsterdam School of Real Estate

The Value Premium in International REITs

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"The most common cause of low prices is pessimism - sometimes pervasive, sometimes specific to a company or industry. We want to do business in such an environment, not because we like pessimism but because we like the prices it produces. It's optimism that is the enemy of the rational buyer."

Warren Buffett

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Abstract

We find evidence of a value premium of 10.3 per cent per annum for international developed REITs over the period Q2-1993-Q2-2013. REITs with a high book value of equity compared to their market value of equity (in case of REITs book value of equity is approximately equal to Net Asset Value (NAV)) perform significantly better than REITs with a low book to market multiple. Even after controlling for risk factors in the single factor CAPM model or the Fama French three factor model, the value strategy provides significant alpha. This suggests value premium is the result of naive extrapolation of past performance by real estate investors rather than a commensurate reward for risk. For real estate practitioners, the results provide the basis for the formulation and implementation of a viable indirect global investment strategy.

1 Introduction

1.1 The Value Premium

The origin of the economic literature pertaining to the value premium can be traced back to the classic “Security Analysis” of Graham and Dodd (1934). They argued that investors regularly undervalued out-of-favor companies by excessively focusing on the earnings track record rather than on the value of the business. Undervalued stocks can be found by comparing the market value of equity with fundamental values such as the book value of equity. Buying stocks that have low prices relative to assets and earnings – while ignoring track record – leads to a significantly better than average performance, thus yielding the value premium. One of the students of Graham and Dodd that has been successful by following this value strategy is Warren Buffett.

Over the years, the value strategy has been investigated extensively in empirical academic studies. In the Journal of Finance alone, Basu (1977), De Bondt and Thaler (1985, 1987), Jaffe, Keim, and Westerfield (1989), Chan, Hamao, and Lakonishok (1991), and Fama and French (1992) and Lakonishok, Shleifer, and Vishny (1994) have published results that indicate that the value premium exists and is statistically significant.

In recent years, value strategies continued to attract academic attention. Fama and French (1998, 2006), Chan and Lakonishok (2004), Petkova and Zhang (2005), Zhang (2005), Phalippou (2007), Mouselli (2010), Chen, Petkova, and Zhang (2008), Campbell, Polk, and Vuolteenaho (2010), Beukes (2011), and Piotroski and So (2012) not only focus on documenting the value premium across different international markets but increasingly test hypotheses pertaining to the cause of the phenomenon.

1.1.1 Risk based Explanation

Two competing explanations for the existence of the value premium are offered. The risk-based school of thought posits that the outperformance of the value stocks is a function of risk. After correcting for the inherent riskiness of value stocks, the value premium disappears. The risk-based school of thought disagrees on the reason for the inherent riskiness of value stocks. Some believe that value stocks are generally financially distressed (i.e. above average financial leverage); others believe that they have a greater difficulty in adjusting to economic downturns as a result of the “asset-rich” nature of their business model (i.e. above average operational leverage). The most visible proponents of this school of thought are Fama and French (1992, 1998, 2006).

1.1.2 Behavioral explanation

Alternatively, the behavioral finance school of thought led by Lakonishok, Shleifer, and Vishny (LSV) (1994, p. 1542) posit that: ”Value strategies might produce higher returns because they are contrarian to ‘naive’ strategies followed by other investors. These naive strategies might range from extrapolating past earnings growth too far into the future, to assuming a trend in stock prices, to overreacting to good or bad news, or to simply equating a good investment with a well-run company irrespective of price. Regardless of the reason, some investors tend

to get overly excited about stocks that have done well in the past and buy them up, so that these 'glamour' stocks become overpriced. Similarly, they overreact to stocks that have done very badly, oversell them, and these out-of-favor 'value' stocks become underpriced. Contrarian investors bet against such naive investors. Because contrarian strategies invest disproportionally in stocks that are underpriced and underinvest in stocks that are overpriced, they outperform the market." By sticking to factual information such as book value per share and not allowing expectations into the decision making process the value investor insulates himself from subjectivity and emotion in making investment decisions.

1.2 Real Estate value premium

A number of studies look into the value premium in the case of Real Estate Investment Trusts (REITs). REITs are the most commonly used vehicle to securitize real estate portfolios so as to make them available to investors that prefer the liquidity that is offered by the equity capital markets. For REITs the book value of Equity is nearly always equal to the Net Asset Value. By buying stocks with a high book value compared to the market value an investors effectively buys REITs with a discount to NAV. Value premium in REITs exists when, in the long run, REITs with a discount to NAV (value REITs) outperform REITs with a premium to NAV (Growth REITs).

1.2.1 Indirect Real Estate (REITs)

Clayton and MacKinnon (2002), Gentry, Jones, and Mayer (2004), Lee, Lee, and Chiang (2005), Chiang, Lee and Wisen (2004), Anderson et al. (2005), Chiang, Lee, and Wisen (2005), Chiang Kozhevnikov, Lee and Wisen (2006) and Ooi, Webb, and Zhou (2007) find evidence of a statistically significant value premium in US REITs. It is important to note that most of them apply the Fama and French three factor model to find evidence of the risk adjusted value premium. Also, with the exception of Ooi, Webb, and Zhou (2007) they do not analyse if the value premium would offer a viable investment strategy nor do they offer an explanation for the value premium. Finally, their sample includes only REITs that are traded on US stock markets.

1.2.2 Direct Real Estate

Addae, Webb, Ho and Liow (2013) recently use US-data and some Asia Pacific cities to study the value premium in direct real estate investments. Using the initial yield (net income over capital value) as ranking variable, they find a cumulative value premium [1] of 76.44 per cent for offices and 117.73 per cent for retail on a 10-year holding period illustrating the value premium also exists in direct real estate investment. Properties with a low (high) initial yield are considered growth (value) investments.

[1] The cumulative value premium has been calculated as an average of several 10 year holding periods. Decile portfolios are formed, where the decile with the highest initial yield has been classified as value portfolio and the decile with the lowest yield as growth portfolio.

1.3 Aim of this study

The aim of this study is to measure and explain the value premium for international REITs. We contribute to the existing literature by broadening the scope beyond US REITs and by providing empirical evidence to the cause of the value premium. We expect that the value premium does exist for international REITs similar to US REITs, although our single currency viewpoint (euro) and the corresponding currency risk could influence the result.

2 Data and Methodology

The empirical research is executed in three phases. First, the returns of value REIT stocks are compared with those of growth REIT stocks in order to establish whether a statistically significant value premium in REIT stocks exists. Next, we measure if the value premium is the commensurate reward for the higher riskiness of value REIT stocks. Finally, we examine whether the value premium is the result of naive extrapolation by investors.

From the Thomson Reuters Datastream database (hereafter "Datastream"), we collect the following data for all REITs (Exhibit 1) that were listed on the stock market of 23 developed countries in the period Q2:1993 - Q2:2013: the stock price, dividends per share, return index, market to book ratio and the market capitalization (MV). If REITs were no longer listed due to bankruptcy, delisting or as a result of take-over (classified as "dead" in Datastream), we included the data pertaining to these REITs for the period that these were actively traded in order to mitigate look-ahead or survivorship bias (Banz and Breen, 1986). In addition to the data collected for each individual stock, we collected exchange rate data as at 30 June of each year from all non-euro currencies to euro. These exchange rates are used to recalculate market values, prices and returns in local currency to EUR since we take the viewpoint of a European investor.

Exhibit 1 | Developed stock markets and number of REITS initially included in sample.

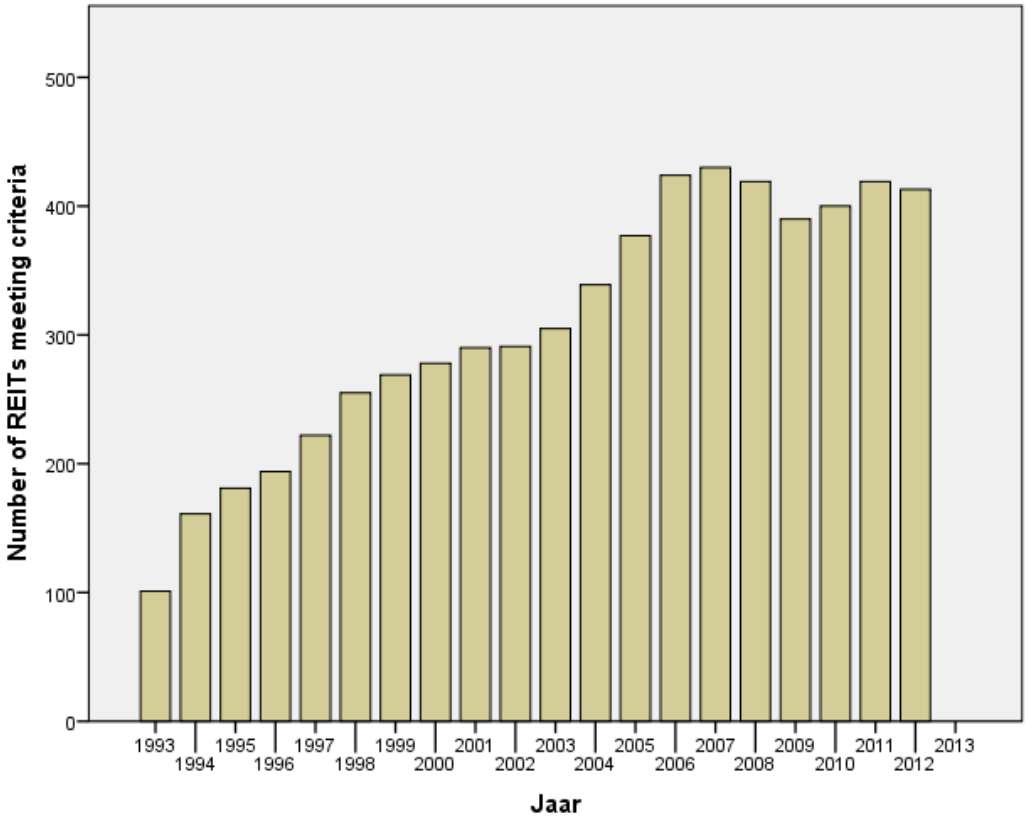
	Market	Number of REITS
1	Australia	232
2	Belgium	19
3	Canada	110
4	Denmark	2
5	France	51
6	Germany	8
7	Greece	3
8	Hong Kong	9
9	Ireland	1
10	Israel	2
11	Italy	3
12	Japan	50
13	Luxembourg	2
14	Netherlands	8
15	New Zealand	0
16	Portugal	1
17	Singapore	42
18	South Korea	20
19	Spain	2
20	Sweden	2
21	Switzerland	1
22	United Kingdom	35
23	United States	549
	Total	1,152

Note: these regions are nearly similar to the 23 countries used by Kenneth French on his website[2] to establish an international HML portfolio for common stocks.

[2] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

Like Fama and French (1992) we use data as of 30 June of each year since by that date most companies will have published their latest annual reports. We exclude companies for which Datastream does not provide sufficient data. To ensure liquidity we require a minimum average daily trade volume in the month June of EUR 0.5 million. Following Ooi et al. (2007) we only include REITs with a positive B/M multiple, since companies with a negative B/M multiple must have negative book value of Equity and therefore tend to be distressed companies. Exhibit 2 shows the number of REITs for each individual year that meet these criteria.

Exhibit 2 | Total number of REITs with minimum daily trade volume (0.5 million EUR) and positive B/M multiple



Note: For all active REITs as at 30 June of each year the average daily trade volume in June has been calculated. When the average daily trading volume exceeds 0.5 million per day and B/M multiples are positive REITS are included in the sample. This exhibit shows the number of REITS with the minimum daily trade volume in June of each year and a positive B/M. All data on trade volumes are obtained from Thomson Reuters Datastream.

The number of REITs listed on developed stock markets with our criteria has risen substantially from 100 in 1993 to over 400 in 2012 thereby allowing institutional investors a growing universe from which they can build securitized real estate exposure.

In line with Ooi et al. (2007) and Lakonishok, Shleifer and Vishny (LSV, 1994) we calculate the ratio of book value of equity per share to share price or the Book to Market (B/M) multiple at 30 June of each year. Next, we rank these stocks according to the B/M ratio and assign an

equal number of stocks to five groups or quintiles each year. For example, if the universe consists of 100 REITs, we assign the twenty companies with the highest B/M ratio to the value quintile (Q1) and those with the lowest rank in terms of B/M to the growth quintile (Q5). These value (growth) companies are equally weighted to form the value (growth) portfolio. Exhibit 3 lists the equally weighted average Book to Market ratio as well as the average Market Value in million EUR.

Exhibit 3 | Characteristics value (Q1) and growth REITs (Q5) (1993-2012)

	Q1	Q2	Q3	Q4	Q5	Q1-Q5	sig. level
B/M	2.22	1.06	0.84	0.65	0.37	1.86	***
MV_EU	445	598	749	1,079	1,543	(1,098)	***

Note: REITs are ranked on their Book to Market (B/M) ratio as at 30 June each year and classified into five quintiles. Q1 represents value stocks (highest B/M) and Q5 represents growth stocks (lowest B/M). The ratio represents the average Book Value of Equity in the last accounting year before 30 June divided by the market value as at 30 June. For each B/M quintile equally weighted means of Book to Market as well as Market Value (MV_EU, in million EUR) are calculated. The t-statistic has been calculated using the means of each year. All data are obtained from Thomson Reuters Datastream.

*** significant at 1% level.

Value REIT stocks (Q1) have a higher mean B/M than growth REIT stocks (2.22 v 0.37) which is inherent to the ranking method. Exhibit 3 also shows that the mean Market Value (MV_EU) of value REITs is smaller than the mean Market Value of growth REITs (445 v 1,543 million EUR). Both differences in B/M and size between Q1 and Q5 are statistically significant at one per cent level. Results are comparable to those found by Ooi et al. (2007) who find a B/M range of 1.90 to 0.32 and a MV range of 143 to 796 million USD. It is important to note that Ooi et al. (2007) only used US REITs, listed in the period from 1991 to 2000 and the average REIT size has grown substantially since 2000.

3 Results

3.1 Returns from value and growth REITs

As the result of the consistent empirical evidence provided for the value premium, it is generally accepted by financial economists that the value premium is a factor that explains the expected return for common stocks. One of the factors in the widely applied three factor model of Fama and French (1992) is HML which denotes the positive relationship between expected stock return and the relative position of the stock in the B/M ranking of all stocks.

To test whether international value REITs also outperform growth REITs, we have calculated total returns in euro for a one-year holding-period, starting directly after portfolio formation. The simple mean one-year holding period returns for Q1 to Q5 as well as the difference between Q1 and Q5 are shown in Exhibit 4.

Exhibit 4 | Average annual holding period returns of value and growth portfolios (1993-2013)

	Q1	Q2	Q3	Q4	Q5	Q1-Q5	sig. level
Total Return (1-year)	0.218	0.145	0.131	0.101	0.115	0.103	**

Note: REITs are ranked on their Book to Market (B/M) ratio as at 30 June each year. The ratio represents the Book Value of Equity in the last accounting year before 30 June divided by the market value as at 30 June. For each B/M quintile equally weighted total returns in EUR are calculated for a one- year holding period as well as the mean difference between Q1 and Q5. The t-statistic of the difference between Q1 and Q5 has been calculated using the means of each year. All data are obtained from Thomson Reuters Datastream.
** significant at 5% level

Exhibit 4 shows that the value premium is 10.3 percent on a one year holding period. Value REITs outperform growth REITs at five per cent significance level. The returns are equally weighted mean returns over the sample period. Time series variation is used to calculate the significance level of the difference between Q1 and Q5 returns. The empirical evidence indicates that investors can expect a statistically significant value premium for REITs traded on the developed world's stock markets. Our sample exhibits a positive value premium in 15 out of 20 years therefore the value strategy turns out to be a robust investment strategy.

Next, we investigate whether the risk based (as opposed to the behavioural based) school of thought effectively explains the existence of the value premium.

3.2 Are value REITs riskier?

Fama and French (1993) suggest that value premium is the reward that investors receive for accepting higher risk. They argue that value stocks are riskier as a result of a higher susceptibility to financial distress.

Fama and French (1993) have formalised this argument by defining the three factor model which implies the expected return for a stock is determined by three risk factors: the beta factor, the HML factor and the SMB factor. In line with previous studies such as Gentry et al. (2004), Chiang et al. (2004), Anderson et al. (2005) and Chiang et al. (2006) we have tested

the risk based explanation for the value premium by obtaining these SMB- and HML-factors from Kenneth French's website[3]. Important to note that we have used the factors for the global developed markets since our sample only consists of developed REITs.

In line with Ooi et al. (2007) we use three generally accepted risk measures to test whether the risk explanation is indeed a valid one for international REITs. These three risk measures are the standard deviation (and the related Sharpe and Treynor ratio), the beta from the Sharpe-Lintner CAPM model and the factor loadings from the Fama and French three factor model (1993).

Equations (1) and (2) denote the CAPM and three factor model respectively:

$$R_i\text{-}R_f = a_i + b_i(R_m\text{-}R_f) + e_i \qquad 1)$$

$$R_i\text{-}R_f = a_i + b_i(R_m\text{-}R_f) + s_iSMB + h_iHML + e_i \qquad 2)$$

Where R_i is the yearly return for our five quintile portfolios, R_f is the one-month US T-bill rate taken from Kenneth French's website and R_m is an equally weighted market return for four global regions which is also taken from French's website (section International Research Returns). SMB (Small minus Big) and HML (High B/M minus Low B/M) mimicking portfolios are also taken from French's website. The four global developed regions are Japan, Asia (ex Japan), North America and Europe and they comprise almost exactly the developed countries we use[4]. When the risk based explanation holds for international REITs we expect to find higher standard deviations, and higher beta's for our Value portfolios than for our Growth portfolios and similar sharpe and treynor ratio's as well as no significant alpha.

Exhibit 5 | Risk measures for value and growth portfolios (1993-2013)

Panel A: Risk measured by Standard deviation and Sharpe and Treynor ratio	Q1	Q2	Q3	Q4	Q5
St. deviation	0.259	0.209	0.204	0.190	0.220
Sharpe ratio	0.705	0.587	0.554	0.440	0.446
Treynor ratio	0.378	0.217	0.205	0.152	0.133
Panel B: Market Risk (Beta) CAPM: R_i-R_f = a_i + b_i*(R_m-R_f) + err					
a_i	0.163 **	0.088 *	0.076 *	0.047	0.052
b_i	0.499	0.536 **	0.495 **	0.472 **	0.649 ***
Panel C: Fama French 3 factor model: Ri-Rf = a_i + b_i*(Rm-Rf) + s_i*SMB + h_i*HML + err					
a_i	.124 *	.059	.051	.014	.029
b_i	.759 *	.715 **	.620 **	.658 ***	.775 ***
s_i	-1.102 *	-.750 *	-.515	-.775 **	-.519
h_i	.445	.361 *	.323	.416 ***	.290

Note: REITs are ranked on their Book to Market (B/M) ratio as at 30 June each year. The ratio represents the Book Value of Equity in the last accounting year before 30 June divided by the market value as at 30 June. The

[3] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_developed.html

[4] Kenneth French uses Austria, where we have included Israel into our set of developed countries

standard deviation of the annual returns has been calculated as well as the Sharpe and Treynor ratio. Moreover, for each B/M quintile linear regressions have been performed on the yearly excess returns ($R_i - R_f$), which represent the portfolio return minus the 'risk free' return. The risk free return is the 1-month US T-bill taken from Kenneth French's website. In panel B, the CAPM model, the only independent variable is the market excess return for common stocks. The return of the market was taken from Kenneth French's website representing an average stock market return of four global regions (North-America, Europe, Japan and Asia without Japan). For the three factor model (panel C) the equation has been extended with two known risk factors (HML and SMB). Following Ooi et al. (2007) international HML and SMB factors for common stocks are also taken from Kenneth French's website. The t-statistic of the difference between Q1 and Q5 has been calculated using the means of each year. All data are obtained from Thomson Reuters Datastream.

*** significant at 1% level

** significant at 5% level

* significant at 10% level.

Exhibit 5 shows that, although the standard deviation of the annual returns of the value strategy is slightly higher than that of the growth strategy (.259 versus .220), the superior risk-adjusted performance of value REITs compared to growth REITS is illustrated by the substantially higher Sharpe and Treynor ratios (.705 and .378 versus .446 and .133 respectively). Moreover, the CAPM or three factor model indicate that the value strategy is not at all riskier than the growth strategy. The beta found when applying CAPM is .649 for the growth strategy and .499 for the value strategy, also indicating that the value strategy is not riskier at all. Furthermore, according to CAPM the value strategy generates a statistically significant alpha of 16.3 per cent compared to a non-significant alpha of 5.2 per cent for the growth strategy.

When SMB and HML are included as risk factors (Fama and French, 1993), only the value quintile generates a statistically significant alpha of 12.4 per cent per annum while the returns of the other quintiles do not generate any significant abnormal returns that cannot be explained by risk factors. Moreover, the widely used beta risk factor for the value strategy (.759) is comparable to that of the growth strategy (.775) indicating a similar riskiness of both strategies. At least, these results do not support the risk-based explanation for the existence of the REIT value premium.

3.3 Why are value REITs under-priced?

The behavioural finance school of thought led by Lakonishok et al. (1994) offers an alternative explanation for the value premium. According to the behavioural school, the superior returns of value stocks over growth stocks are caused by naive extrapolation by investors of past stock performance. Most investors expect the good track record of growth stocks to continue for an extended period of time. They are willing to pay high prices in order to acquire exposure to such allegedly attractive companies. This frequently causes them to overpay as the inevitable mean reversion of results back to the long-term trend tends to lead to disappointment when growth companies' results are published. Conversely, investors are overly pessimistic about the prospects of value stocks. As the value stocks publish results that exceed consensus estimates, these stocks outperform thus generating the value premium.

Ooi et al. (2007) test the behavioural explanation for US REITs by examining the pre- and post-formation returns of value and growth portfolios. They find that value REITs, whose

returns have been significantly lower than those of growth REITs in the three years before formation, outperform the growth REITs in all five consecutive years after formation, where the first three years are statistically significant at five per cent level.

We have compared pre and post formation returns similar to Ooi et al. (2007). Exhibit 6 shows that value REITs generate lower returns than growth REITs in all three years prior to formation and the difference is statistically significant in the last two years. The mean reversion phenomenon as posited by the behavioural school of thought is clearly visible from the post formation returns. Returns of value REITs are superior to those of growth REITs in the first four years after portfolio formation. The outperformance is statistically significant in year one and fades away from year two onwards. This indicates that yearly rebalancing is necessary to consistently earn the value premium.

Exhibit 6 | Pre- and post-formation performance value vs growth portfolios (1993-2012)

	Q1	Q2	Q3	Q4	Q5	Diff Q1-Q5 sig.level
Panel A: Pre-formation Returns						
TR -3	0.116	0.161	0.193	0.187	0.198	-0.083
TR -2	0.090	0.164	0.172	0.161	0.204	-0.114 **
TR -1	0.082	0.148	0.167	0.161	0.219	-0.137 ***
Panel B: Post-formation Returns						
TR 1	0.218	0.145	0.131	0.101	0.115	0.103 **
TR 2	0.165	0.132	0.120	0.120	0.122	0.043
TR 3	0.176	0.140	0.135	0.134	0.133	0.043
TR 4	0.159	0.121	0.135	0.147	0.148	0.010
TR 5	0.118	0.124	0.115	0.114	0.174	-0.057

Note: REITs are ranked on their Book to Market (B/M) ratio as at 30 June each year. The ratio represents the Book Value of Equity in the last accounting year before 30 June divided by the market value as at 30 June. For each B/M quintile equally weighted total returns are calculated for one, two and three years prior to formation (TR-3, TR-2, TR-1) as well as the 5 years after formations (TR 1 to TR 5). Furthermore the mean difference between Q1 and Q5 is calculated for each year. The t-statistic of the difference between Q1 and Q5 has been calculated using the means of each year. All data are obtained from Thomson Reuters Datastream.

*** significant at 1% level

** significant at 5% level

* significant at 10% level.

The results presented in exhibit 6 are in line with the behavioural explanation of the value premium. Investors are extrapolating historical performance and thus become pessimistic (optimistic) about the prospects of value (growth) stocks. This explains the underperformance (outperformance) of value (growth) stocks in the period preceding portfolio formation. When value (growth) companies subsequently report their earnings and dividends in the years after portfolio formation, investors are positively (negatively) surprised and positively (negatively) adjust the valuation of value (growth) stocks. This reversal of relative performance (reversion to the mean) explains the value premium.

Another way to determine whether investors indeed are generally susceptible to naive extrapolation of past performance is by examining the growth rates of a fundamental variable such as dividend. Ooi et al. (2007) find that lower (higher) past growth of dividends for value

(growth) US REITS are followed by higher (lower) growth rates[5] during the post formation years. They also show that US value REITs have a dividend yield that is significantly higher than that of growth REITs.

Exhibit 7 | Expected and Actual Growth Rates of value and growth Portfolios (1993-2013)

	Q1	Q2	Q3	Q4	Q5	Diff Q1-Q5	sig.level
Panel A: Fundamental values							
D/P	0.075	0.080	0.079	0.071	0.056	0.018	***
Panel B: Past Growth rates							
ADG (-3,0)	-0.150	0.059	0.138	0.060	0.044	-0.193	***
Panel C: Actual Future growth rates							
ADG (0,2)	0.036	0.012	-0.004	-0.030	-0.025	0.062	
ADG (0,1)	0.096	0.054	0.018	-0.042	0.015	0.081	
ADG (1,2)	0.102	-0.013	-0.016	0.016	-0.049	0.150	
ADG (2,3)	0.094	0.020	-0.053	-0.019	0.037	0.057	

Note: REITs are ranked on their Book to Market (B/M) ratio as at 30 June each year. For each B/M quintile dividend to price ratios are calculated by dividing the dividend in year t-1 by the share price at 30 June of year t. ADG (i,j) is the average annual growth rate of dividends between year I and j on portfolio level. Therefore it is not the mean of each individual stocks growth rate, but rather the growth rate of the sum of dividends of an equally weighted portfolio of REITs.The t-statistic of the difference between Q1 and Q5 has been calculated using the means of each year. All data are obtained from Thomson Reuters Datastream.

*** significant at 1% level.

Exhibit 7 shows that the portfolio of international value REITs has a significantly higher average D/P ratio at formation date (.075 versus .056) and has experienced significantly lower growth rates over the three years before portfolio formation (-15.0 percent versus 4.4 percent). However, in the two years after formation, the tables turn as the value REITs generate a higher dividend growth rate, although not statistically significant. The average annual dividend growth rate of a portfolio of value REITs in the first two years after formation is 6.2 percent higher than that of growth REITs. The yearly dividend growth of value REITs in year one, two and three after formation are also larger than those of growth REITs, although not statistically significant. These figures indicate that pre-formation growth rates for growth REITs are extrapolated too far in the future and in reality turn out to be overrated, where negative past growth rates of Value REITs revert to a long term mean of positive growth rates.

[5] For this test the actual growth rate of a quintile portfolio is computed as follows: for each of the five portfolios an investor is assumed to invest a fixed amount (say 1 EUR) in each stock in the first year. In the case of dividend growth, the total dividend earned by each portfolio in each year of the holding period is determined by multiplying the dividend per share of each individual stock by its initial proportional weight in the portfolio. From these dividends the growth rate from year 1 to year 2 or 3 at portfolio level can be calculated.

The evidence on the pre- and post-formation development of fundamentals such as dividend growth and stock returns provides support for the behavioural explanation of the value premium of REITs.

4 Conclusion

REITs listed on the international developed markets offer investors a value premium that is both economically (10.3 per cent per annum) and statistically (5 per cent level) significant, when a one year holding period is applied. This value premium of international REITs can not be explained by a higher risk attached to the value portfolio. Both CAPM and the Fama French three-factor model fail to explain the value premium from a risk perspective. Pre- and post-formation performance tests show that investors might extrapolate past performance too far in the future and rely too much on dividend growth from the 3 years prior to formation.

Our results are comparable to those of Ooi et al. (2007) who find a value premium for US REITs of 8.5 per cent for a one-year holding period. When the second or third year after formation is considered Ooi et al. find higher and statistically significant value premiums. This could be caused by the fact that our returns are in euro and from stocks listed on global developed markets and due to the fact that we have extended the period of study to 2013 including the global financial crisis.

The magnitude and significance of the value premium still offers investors enticing possibilities to exploit a profitable investment strategy. In efficient markets, such a profitable investment strategy would attract arbitrage to a level where the strategy would no longer offer sufficient returns to be worthwhile. Why does the value premium continue to exist despite the fact that there is a substantial body of publicly available evidence for the premium? One potential answer to this conundrum could be the institutional arrangements that govern the investment industry. Prices in the developed international stock markets are dominantly determined by institutional investors like pension funds, insurance companies and mutual funds. These investors traditionally manage sizeable equity portfolios and are expected to outperform stock market indices supplied by institutions like MSCI and FTSE. In order to beat the market benchmark the institutional investors stay as closely as possible to the benchmark by overweighting stocks that have been winners in the recent past. If these past winners continue to outperform the market they have reached their goal, but if these popular stocks prove to be a disappointment, the investor will refer to the fact that most other investors (would) have chosen them too. In other words, investors have no incentive to take the risk of investing in unpopular companies with recent poor performance as opposed to following the herd of competing investors by investing in well known blue chips with superior past performance. As long as the short-term performance measurement determines the investors' career prospects, the value premium will perpetuate.

Further research might include international direct real estate investments as suggested by Addae et al. (2013) for US and Asian Pacific cities.

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