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LEISURE INDUSTRY & INVESTMENT STRATEGIES. THE CASE OF EUROPEAN COMPANIES

The objective of the present research is to investigate whether the investment strategies based on: a) the systematic risk of a company, b) the dividend yield of a company, and c) the momentum of a stock as it is measured by the price performance over the previous calendar year, can produce above market returns. The sample consisted of all listed companies that operate within the leisure industry on a European level from 2009 to 2019.

The results showed that investors in the leisure industry companies: a) are compensated for assuming low systematic risk (low beta portfolios) against to high systematic risk (high beta portfolios), b) must choose portfolios consisting of stocks with high dividend yield stocks rather than portfolios consisting of low dividend yield stocks, and c) are better off by choosing stocks that had a positive momentum in the previous year than stocks that had a low price performance in the previous year.

Keywords: market efficiency; leisure industry; investment strategy; portfolio performance.

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ІНДУСТРІЯ ВІДПОЧИНКУ ТА ІНВЕСТИЦІЙНІ СТРАТЕГІЇ. КЕЙС ЄВРОПЕЙСЬКИХ КОМПАНІЙ

Мета цього дослідження полягає в тому, щоб дослідити, чи інвестиційні стратегії, засновані на: а) систематичному ризику компанії, б) дивідендній прибутковості компанії, і в) імпульсі акцій, як це вимірюється ціновою ефективністю за попередній календарний рік, може принести прибуток вище ринкового. Вибірка складалася з усіх зареєстрованих на біржі компаній, які працюють у сфері відпочинку на європейському ринку з 2009 по 2019 рік.

Результати показали, що інвестори в компанії індустрії дозволя: а) отримують винагороду за припущення низького систематичного ризику (низькі бета-портфелі) проти високого систематичного ризику (високі бета-портфелі), б) повинні обирати портфелі, що складаються з акцій з високою дивідендною прибутковістю, ніж портфелі, що складаються з акцій з низьким дивідендним доходом, і с) краще вибирати акції, які мали позитивний імпульс у попередньому році, ніж акції, які мали низьку цінову ефективність у попередньому році.

Ключові слова: ефективність ринку; індустрія дозволя; інвестиційна стратегія; продуктивність портфоліо.

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ИНДУСТРИЯ ОТДЫХА И ИНВЕСТИЦИОННЫЕ СТРАТЕГИИ. КЕЙС ЕВРОПЕЙСКИХ КОМПАНИЙ

Цель этого исследования состоит в том, чтобы исследовать, инвестиционные стратегии, основанные на: а) систематическом риске компании; б) дивидендной доходности компании; и в) импульсе акций, как это измеряется ценовой эффективностью за предыдущий календарный год, может принести прибыль выше рыночного. Выборка состояла из всех зарегистрированных на бирже компаний

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работающих в сфере отдыха на европейском рынке с 2009 по 2019 год. Результаты показали, что инвесторы в компании индустрии досуга: а) получают вознаграждение за предположение низкого систематического риска (низкие бета-портфели) против высокого систематического риска (высокие бета-портфели); б) должны выбирать портфели, состоящие из акций с высокой дивидендной доходностью, чем портфели, состоящие из акций с низким дивидендным доходом, и с) лучше выбирать акции, которые имели положительный импульс в предыдущем году, чем акции, которые имели низкую ценовую эффективность в предыдущем году. Ключевые слова: эффективность рынка; индустрия досуга; инвестиционная стратегия; производительность портфолио.

1. Introduction. Over the years, several investment strategies have been developed that claim to produce above market returns by taking advantage of market inefficiencies in the pricing of stocks. Such strategies are based upon “market anomalies” a term that typically refers to the rejection of an asset pricing model, such as the CAPM (Linnainmaa and Roberts, 2018). According to Harvey et al. (2015) over 300 market anomalies have been identified in the literature that can be classified within the following factor categories: a) financial, b) macro, c) microstructure, d) behavioral, and e) accounting.

Reiganum (1981), Banz (1981) and Fama & French (1992, 1993) examined whether the size of a firm influences the return its stock produces and showed that small firms on average have higher returns than large firms.

Ibbotson (1986), DeBondt and Thaler (1987), Capaul et al. (1993), Fama & French (1992, 1993), and Lakonishok et al. (1994) examined the returns of stocks with low price to book value ratios against returns of stocks with high price to book value ratios and showed that stocks with a low valuation earn on average higher returns than growth stocks, i.e. stocks with a high valuation and high price-to book ratios. However, other studies have found somewhat different results, such as Lee & Song (2002), which concluded, “value stocks tend to outperform growth stocks around recession periods”.

Basu (1977), Oppenheimer (1984), Chan et al. (1991), Fama & French (1996) examined the relationship between price to earnings ratios (P/E) and stock returns, using mainly data from the New York and American Stock Exchanges, and observed that stocks with low P/E ratios have a propensity to outperform stocks with high P/E ratios.

Keppler (1991) and Lakonishok et al. (1994) studied the relationship between price to cash flow ratios and stock returns. Their findings showed that the investment strategy that is based on the lowest price to cash flow ratio produces greater returns than the one based on the highest cash flow to price ratio strategy.

Litzenberger & Ramaswamy (1982), Keim (1985), Levis (1989), Christie (1990), and Morgan & Thomas (1998) examined the effect that dividend yield has on stock price valuation and concluded that stocks with high dividend yields tend to outperform the market on average.

Jegadeesh and Titman (1993) examined the momentum of a stock and concluded that a strategy based on buying the stocks that performed well in the past (winners) and selling the stocks that performed poorly in the past (losers) will generate above market returns. On the other hand, De Bondt & Thaler (1985) concluded that over the long-term losers outperform winners.

Dissanaike and Lim (2010) focus on the performance of contrarian strategies, in the UK equity market, based on one hand on sophisticated valuation models such as the RIM and the Ohlson model and on the other on simpler ranking variables. They find that although the sophisticated models beat most of the simpler strategies, they are only slightly more profitable.

Lee et al. (2014) show that the Ohlson model can forecast future stock price movements much more accurately in any predicted horizon. Hand et al. (2017) show that the Ohlson (1995) model appears to best explain stock prices. Pinochi et al. (2019) find that the RIM proves to be extremely effective in signalling overvalued stocks and producing substantial long-short returns.

All the above studies used samples from the stock exchanges of US, UK and other developed countries on an aggregate level. However, there are no studies that focus on certain industries within an economy or studies that focus on a specific industry on a European basis.

The objective of the present research is to investigate whether certain investment strategies based on the most prominent market anomalies can produce above market returns, using data from listed companies that operate within the leisure industry on a European level. The leisure industry is a segment of business focused on tourism, recreation, entertainment, and sports related products and services, with total revenues on a global basis of almost \$1.9 trillion.

Specifically, three different investment strategies will be evaluated; the first one is based on the systematic risk of a company, the second is based on the dividend yield of a company and the third one is based on the momentum of a stock as it is measured by its price performance over the previous calendar year. In testing the above investment strategies, the “portfolio approach” will be used as it is described by Damodaran (2012).

The remainder of the paper is constructed as follows. The second section presents the sample and data collection sources. The third section analyses the methodology employed for examining the objective of the research. The results from the empirical procedure are presented and discussed in section 4. The last section presents an overview of the issues raised and draws some implications for future research.

2. Sample and Data Collection. The data set consists of listed companies from the European leisure industry. Specifically, company data from the following countries were collected: Finland, United Kingdom, Switzerland, Turkey, Hungary, Portugal, Spain, Poland, Norway, Luxembourg, Italy, Netherlands, Ireland, Greece, Belgium, Germany, Denmark, France, Czech Republic, Sweden, and Austria.

We start by collecting on firm-level basis accounting information as provided by Worldscope as well as the monthly total returns information regarding common stocks from Datastream that are available for each country, for the examined period 2009-2019.

Stocks presenting price returns less than 50% or above 300% that are reversed within one month are excluded from our sample so as to identify suspicious returns, (Ince and Porter, 2006). All the variables among company-level are winsorized at the 1% and 99% level aiming to mitigate the impact of extreme prices. Also, according to Titman et al. (2013) the prerequisite for each country to be included in the sample is to have at least 30 stocks in each sampling year to ensure that the number of compa-

nies in the portfolio and cross-sectional regression testing is reasonable and can continue. Our last step for conducting a solid sample to examine was to restrict it to firm-year observations without missing data in order to calculate the primary variables of interest.

3. Methodology. To test whether certain investment strategies can produce excess returns greater than others the “portfolio approach” will be used. In essence this approach involves the allocation of the sample firms into model portfolios based on the variable (beta, dividend yield, and price performance) characterizing each investment strategy and then tracking the performance of the model portfolios in the future.

Thus, the analysis of the data involved two distinct time periods: a) a pre allocation time period, which is 52 weeks prior to the construction of the model portfolios and in which the variables of each investment strategy are calculated, and b) a data analysis time period, which is 52 weeks after the pre allocation time period and in which the performance of each model portfolio is calculated. Following the above process resulted in the rebalancing of the model portfolios once a year and a total of five times for the whole period of the research.

3.1. Beta Coefficient Investment Strategy. The first step of the analysis involved the calculation of the weekly returns (iRS_{weekly}) of each sample stock and the weekly returns (RI_{weekly}) of the Stoxx Europe 50, which served as a proxy of the market portfolio, for each pre allocation time period.

$$iRS_{\text{weekly}} = \ln [(iPS_{\text{fw } t} + iDs) / iPS_{\text{fw } t-1}] \quad (1)$$

$$RI_{\text{weekly}} = \ln (PI_{\text{fw } t} / PI_{\text{fw } t-1}) \quad (2)$$

where,

$iPS_{\text{fw } t}$ = Price of stock i at the end of the week t

$iPS_{\text{fw } t-1}$ = Price of stock i at the end of week $t-1$

$iPI_{\text{fw } t}$ = Price of Stoxx Europe 50 at the end of the week t

$iPI_{\text{fw } t-1}$ = Price of Stoxx Europe 50 at the end of week $t-1$

The beta coefficient (β_i) for each sample firm was then calculated, at the beginning of each data analysis period, by regressing its weekly performance against the weekly performance of the Stoxx Europe 50 using fifty-two weekly data from the pre-allocation time period.

$$iRS_{\text{weekly}} = \alpha + \beta_i RI_{\text{weekly}} + \varepsilon_i \quad (3)$$

The sample firms were then sorted, at the beginning of each data analysis period, in descending order according to their beta coefficient. The next step involved the classification of the sample firms based on their beta coefficient into three portfolios from lowest to highest beta coefficient classes, with each portfolio having one third of the total market capitalization of the sample. The first portfolio consisted of stocks with the highest beta coefficient and the third portfolio consisted of stocks with the lowest beta coefficient.

The weighting factor of each stock (iws) was the ratio of the market capitalization of the stock ($iMCAP_s$) over the total market capitalization of the portfolio ($iTMCAP_{PF}$) it was allocated.

$$iws = iMCAP_s / iTMCAP_{PF} \quad (4)$$

3.2. Dividend Yield Investment Strategy

The dividend yield (D/Y_i) of each sample stock i was calculated, at the beginning of each data analysis period, as the ratio of the dividend per share (iDs) over the closing price (iPs) of the stock on the ex-dividend date.

$$D/Y_i = iDs / iPs \quad (5)$$

At the beginning of each data analysis period the sample firms were sorted in descending order according to their dividend yield. Next, they were classified into three portfolios from highest to lowest dividend yield, with each portfolio having one third of the total market capitalization of the sample. The first portfolio consisted of stocks with the highest dividend yield and the third portfolio consisted of stocks with the lowest dividend yield. The sample stocks were again weighted according to their market capitalization relative to the total market capitalization of the portfolio they were allocated.

3.3. Price Performance Investment Strategy

The price performance of each sample stock, at the beginning of each data analysis period, was calculated as the annual total return (iRS_{annual}) for each pre-allocation period.

$$iRS_{\text{annual}} = \ln [(iPs_{y t} + iDs) / iPs_{y t-1}] \quad (6)$$

where,

$iPs_{y t}$ = Price of stock i at the end of the calendar year

$iPs_{y t-1}$ = Price of stock i at the end of the previous calendar year

The sample firms were sorted, at the beginning of each data analysis period, in descending order according to their last year total return. Then they were classified into three portfolios from highest to lowest last year total return, with each portfolio having one third of the total market capitalization of the sample. The first portfolio consisted of stocks with the highest last year total return and the third portfolio consisted of stocks with the lowest last year total return. The sample stocks were once again weighted according to their market capitalization relative to the total market capitalization of the portfolio they were allocated.

3.4. Portfolio Actual and Expected Returns

Having allocated the sample stocks into the model portfolios according to each variable separately for all years of the research, the next step in the methodology involved the calculation of the actual and expected returns of all portfolios on a quarterly basis. In doing so, the weighted quarterly return for each sample stock ($iRS_{\text{quarterly}}$) was first computed for each data analysis period as follows:

$$iRS_{\text{quarterly}} = \ln [(iPs_{q l} + iDs) / iPs_{q s}] * iws \quad (7)$$

where,

$iPs_{q l}$ = Price of stock i at the end of the quarter

$iPs_{q s}$ = Price of stock i at the beginning of the quarter

The actual quarterly return of each model portfolio was calculated as the sum of the weighted quarterly returns of the stocks consisting of the portfolio.

$$R_{PFq} = \sum_{t=1}^n i R_S \quad (8)$$

The beta coefficient of each model portfolio (b_{PF}) was calculated as the weighted average beta coefficient (i_b) of the stocks of each portfolio.

$$b_{PFq} = \sum_{t=1}^n i b_S \quad (9)$$

The expected quarterly return (iER_{PFq}) of each model portfolio was calculated according to the Capital Asset Pricing Model, where the three month Euribor served as the risk free rate of return (r_f) and the Stoxx Europe 50 was used as proxy of the market portfolio (r_m):

$$iER_{PFq} = r_f + b_{PFq} (r_m - r_f) \quad (10)$$

The excess return of each portfolio was calculated as the difference between the actual and the expected return. Finally, the t-test was used to evaluate the statistical significance of the differences of the means of the excess returns of the portfolios.

4. Empirical Results

4.1. Beta Coefficient Investment Strategy

The results of the empirical research showed that the low beta portfolios outperformed the high beta portfolios on a quarterly basis (Table 1). Specifically, the low beta portfolios had: a) greater quarterly excess returns than the high beta portfolios in thirty two out of forty four cases, b) greater actual returns than the high beta portfolios in thirty of forty four cases, and c) greater average expected returns than the high beta portfolios in twenty six out of forty four cases. Furthermore, both low beta portfolios produced returns above the expected ones in only ten cases out of forty four, whereas high beta portfolios produced positive excess returns in only six cases out of forty four. Finally, on an average quarterly basis the low beta portfolios had a higher actual and excess return.

Turning to the yearly returns (Table 2) it must be noted that the low beta portfolio produced a higher actual return than the high beta portfolio in over 65% of the total cases, a higher expected return than the high beta portfolio in 45% of the total cases, and a higher excess return than the high beta portfolio in over 80% of the total cases. Furthermore, actual and excess average annual return are higher for the low beta portfolio.

Both the quarterly and yearly results indicate that investors in the European Leisure industry are compensated for assuming low systematic risk (low beta portfolios) against high systematic risk (high beta portfolios), which is in contradiction to the Capital Asset Pricing Model. The results were statistically significant in all years except one.

4.2. Dividend Yield Investment Strategy

The findings of the present research showed that the dividend yield of the sample companies could be an important factor in the pricing of the stock. Specifically, portfolios with high dividend yields outperformed those with low dividend yields, on an excess return basis, in thirty out of forty-one quarters (Table 3). Furthermore, the

high dividend yield portfolios exhibited a larger actual return in twenty nine out of twenty forty-one quarters. Finally, the excess return of the high dividend yield portfolios was larger in 59.09% of the total cases.

The actual quarterly average return of the high dividend yield portfolios 1.65% was greater than the actual quarterly average return of the low dividend yield portfolios 0.67%. Finally, on a quarterly basis the high dividend portfolios performed better than the low dividend portfolios, in terms of excess returns.

Turning to a yearly basis the results showed (Table 4) that the low dividend yield portfolio underperformed the high dividend yield portfolio in terms of average yearly actual, expected and excess returns in 80%, 86% and 54% of the cases respectively. Furthermore, the average actual, expected and excess return of the high dividend yield portfolios is higher than the ones of the low dividend portfolios.

4.3. Price Performance Investment Strategy. In the area of past performance, the results of the empirical research showed that investors in the European leisure industry are better off by choosing stocks that had a high performance in the previous year than stocks that had a low performance in the previous year. Specifically, the low price performance portfolios underperformed the high price performance portfolios on a quarterly basis (Table 5), since, the low price performance portfolios had: a) smaller quarterly excess returns than the high price performance portfolios in 61.36% of the total cases, b) smaller actual returns than the high price performance portfolios in 63.64% of the total cases. Furthermore, the average actual, expected and excess returns of the high price performance portfolios was higher than the one of the low absolute performance portfolios.

Turning to the yearly returns the results showed that the high price performance portfolio had a better performance than the low price performance portfolio (Table 6) in terms of actual, expected and excess. Furthermore, the high price performance portfolio exhibited larger actual, expected and excess returns than the low absolute performance portfolios in 71%, 74% and 74% respectively of the total cases.

5. Conclusions. The objective of the present research was to investigate whether the investment strategies based on: a) the systematic risk of a company, b) the dividend yield of a company, and c) the momentum of a stock as it is measured by the price performance over the previous calendar year, can produce above the market returns, using data from leisure sector of listed companies on a European level.

The results showed that firstly investors in the leisure sector are compensated for assuming low systematic risk (low beta portfolios) against high systematic risk (high beta portfolios), which is in contradiction to the Capital Asset Pricing Model.

Secondly, the dividend yield of a leisure company listed in the European Stock Exchanges could be an important factor in the pricing of the stock. Portfolios consisting of stocks with high dividend yield outperformed those with low dividend yield both on quarterly and on a yearly basis.

Thirdly, investors in the leisure sector are better off by choosing stocks that had a high performance in the previous year than stocks that had a low performance in the previous year. However both the high and low past performance strategy produced negative total returns for the period under investigation.

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Table 1. Beta Coefficient Strategy

Quarter	Low Beta Portfolio			High Beta Portfolio		
	Actual	Expected	Excess	Actual	Expected	Excess
1st 2009	-0.76%	-0.11%	-0.65%	-1.40%	-1.19%	-0.21%
2nd 2009	-2.37%	-0.24%	-2.13%	-6.75%	-1.33%	-5.42%
3rd 2009	-3.75%	-3.51%	-0.24%	-8.46%	-5.26%	-3.20%
4th 2009	7.24%	8.14%	-0.90%	8.05%	9.26%	-1.21%
1st 2010	-3.32%	-1.66%	-1.66%	-6.55%	-3.64%	-2.91%
2nd 2010	0.40%	3.02%	-2.62%	-0.05%	2.70%	-2.75%
3rd 2010	-7.33%	-6.05%	-1.28%	-7.85%	-5.48%	-2.37%
4th 2010	-1.39%	0.61%	-2.00%	-4.17%	-0.29%	-3.88%
1st 2011	-5.25%	-2.55%	-2.70%	-7.21%	-5.58%	-1.63%
2nd 2011	11.44%	6.88%	4.56%	10.22%	12.84%	-2.62%
3rd 2011	3.27%	5.77%	-2.50%	1.97%	4.62%	-2.65%
4th 2011	2.36%	4.94%	-2.58%	3.40%	6.48%	-3.08%
1st 2012	1.56%	2.21%	-0.65%	-2.65%	2.27%	-4.92%
2nd 2012	-0.75%	1.76%	-2.51%	-1.87%	1.27%	-3.14%
3rd 2012	-1.12%	1.82%	-2.94%	-1.32%	1.32%	-2.64%
4th 2012	6.56%	5.42%	1.14%	6.33%	8.35%	-2.02%
1st 2013	0.68%	2.06%	-1.38%	0.17%	1.79%	-1.62%
2nd 2013	0.90%	0.70%	0.20%	2.57%	3.71%	-1.14%
3rd 2013	3.89%	3.85%	0.04%	3.78%	5.51%	-1.73%
4th 2013	2.33%	3.67%	-1.34%	2.85%	4.72%	-1.87%
1st 2014	0.88%	4.06%	-3.18%	0.17%	1.79%	-1.62%
2nd 2014	0.90%	4.81%	-3.91%	2.57%	3.71%	-1.14%
3rd 2014	3.89%	3.85%	0.04%	3.78%	5.51%	-1.73%
4th 2014	2.33%	3.67%	-1.34%	2.85%	4.72%	-1.87%
1st 2015	9.56%	7.04%	2.52%	8.05%	-5.26%	13.31%
2nd 2015	-2.37%	0.00%	-2.13%	-6.55%	9.26%	-15.81%
3rd 2015	-3.75%	-3.51%	-0.24%	-0.05%	-3.64%	3.59%
4th 2015	7.24%	8.14%	-0.90%	-7.85%	2.70%	-10.55%
1st 2016	-3.32%	-1.66%	-1.66%	-4.17%	-5.48%	1.31%
2nd 2016	0.40%	3.02%	-2.62%	-7.21%	-0.29%	-6.92%
3rd 2016	11.08%	6.08%	5.00%	10.22%	-5.58%	15.80%
4th 2016	-1.39%	0.61%	-2.00%	1.97%	12.84%	-10.87%
1st 2017	-5.25%	-4.24%	-1.01%	3.40%	4.62%	-1.22%
2nd 2017	11.44%	6.88%	4.56%	-2.65%	6.48%	-9.13%
3rd 2017	3.27%	5.77%	-2.50%	-1.87%	2.27%	-4.14%
4th 2017	2.36%	4.94%	-2.58%	-1.32%	1.27%	-2.59%
1st 2018	1.56%	2.21%	-0.65%	6.33%	1.32%	5.01%
2nd 2018	-0.75%	1.76%	-2.51%	0.17%	8.35%	-8.18%
3rd 2018	-1.12%	1.82%	-2.94%	2.57%	1.79%	0.78%
4th 2018	6.56%	2.17%	4.39%	3.78%	3.71%	0.07%
1st 2019	0.68%	2.06%	-1.38%	2.85%	5.51%	-2.66%
2nd 2019	0.90%	0.70%	0.20%	0.17%	4.72%	-4.55%
3rd 2019	3.89%	3.85%	0.04%	2.57%	1.79%	0.78%
4th 2019	2.33%	0.50%	1.83%	3.78%	3.71%	0.07%
Average	1.37%	2.26%	-0.89%	0.22%	2.40%	-2.19

Bold numbers indicate statistically significant results at the 1% level.

Table 2. Beta Coefficient Strategy

Year	Low Beta Portfolio			High Beta Portfolio		
	Actual	Expected	Excess	Actual	Expected	Excess
1	0.36%	4.28%	-3.92%	-8.56%	1.48%	-10.04%
2	-2.20%	2.73%	-4.93%	-13.71%	-0.97%	-12.74%
3	0.57%	5.99%	-5.42%	-7.01%	3.06%	-10.07%
4	-3.01%	3.45%	-6.46%	-6.40%	2.84%	-9.24%
5	-11.64%	-4.08%	-7.56%	-18.62%	-6.71%	-11.91%
6	-13.57%	-4.97%	-8.60%	-19.28%	-8.65%	-10.63%
7	-2.53%	-1.11%	-1.42%	-9.01%	1.49%	-10.50%
8	8.07%	10.71%	-2.64%	0.81%	11.59%	-10.78%
9	11.82%	15.04%	-3.22%	8.38%	18.36%	-9.98%
10	18.63%	19.80%	-1.17%	12.94%	26.21%	-13.27%
11	6.44%	14.68%	-8.24%	0.85%	14.64%	-13.79%
12	2.05%	10.73%	-8.68%	-2.44%	11.34%	-13.78%
13	6.25%	11.21%	-4.96%	0.49%	13.21%	-12.72%
14	5.37%	11.06%	-5.69%	3.31%	12.73%	-9.42%
15	7.02%	10.00%	-2.98%	7.75%	15.17%	-7.42%
16	12.03%	12.03%	0.00%	12.85%	19.36%	-6.51%
17	7.80%	10.28%	-2.48%	9.37%	15.73%	-6.36%
18	8.00%	12.28%	-4.28%	9.37%	15.73%	-6.36%
19	8.00%	16.39%	-8.39%	9.37%	15.73%	-6.36%
20	8.00%	16.39%	-8.39%	9.37%	15.73%	-6.36%
21	8.00%	16.39%	-8.39%	9.37%	15.73%	-6.36%
22	16.68%	19.37%	-2.69%	17.45%	8.83%	8.62%
23	13.71%	14.37%	-0.66%	8.63%	14.43%	-5.80%
24	6.17%	7.11%	-0.94%	4.90%	5.38%	-0.48%
25	11.48%	11.63%	-0.15%	-5.40%	3.41%	-8.81%
26	-1.21%	2.96%	-4.17%	-17.63%	3.07%	-20.70%
27	1.55%	6.17%	-4.62%	-18.30%	-6.54%	-11.77%
28	16.28%	15.66%	0.63%	-7.88%	-8.60%	0.72%
29	7.38%	8.03%	-0.65%	1.67%	1.44%	0.23%
30	5.27%	5.42%	-0.15%	9.06%	11.44%	-2.38%
31	15.91%	9.18%	6.73%	13.22%	18.11%	-4.89%
32	7.87%	8.75%	-0.88%	0.65%	25.86%	-25.21%
33	11.14%	12.98%	-1.84%	-3.12%	14.19%	-17.31%
34	17.47%	19.25%	-1.78%	-0.67%	10.79%	-11.46%
35	4.80%	14.03%	-9.23%	1.67%	12.56%	-10.89%
36	-0.07%	9.98%	-10.05%	5.63%	11.98%	-6.35%
37	3.65%	7.36%	-3.71%	10.25%	14.32%	-4.07%
38	2.29%	7.11%	-4.82%	6.29%	18.41%	-12.12%
39	3.46%	5.95%	-2.49%	5.81%	14.68%	-8.87%
40	7.99%	7.88%	0.11%	5.33%	14.58%	-9.25%
41	4.12%	6.21%	-2.09%	5.69%	14.66%	-8.97%
Average	5.89%	9.58%	-3.69%	1.28%	10.17%	-8.89%

Bold numbers indicate statistically significant results at the 1% level

Table 3. Dividend Yield Strategy

Quarter	High Dividend Yield Portfolio			Low Dividend Yield Portfolio		
	Actual	Expected	Excess	Actual	Expected	Excess
1st 2009	-2.36%	-1.12%	-1.24%	-2.45%	0.76%	-3.21%
2nd 2009	-4.60%	-1.25%	-3.35%	-3.00%	0.63%	-3.63%
3rd 2009	-8.49%	-1.09%	-7.40%	-3.28%	-2.09%	-1.19%
4th 2009	9.38%	9.18%	0.20%	4.09%	7.23%	-3.14%
1st 2010	-2.19%	-1.79%	-0.40%	-3.66%	-2.82%	-0.84%
2nd 2010	0.49%	3.00%	-2.51%	-1.29%	2.83%	-4.12%
3rd 2010	-7.23%	-3.20%	-4.03%	-8.17%	-4.47%	-3.70%
4th 2010	-1.01%	0.56%	-1.57%	-1.90%	0.09%	-1.99%
1st 2011	-4.72%	-2.71%	-2.01%	-7.47%	-5.24%	-2.23%
2nd 2011	7.75%	13.09%	-5.34%	12.92%	12.40%	0.52%
3rd 2011	2.66%	3.77%	-1.11%	2.60%	4.52%	-1.92%
4th 2011	5.90%	5.03%	0.87%	4.39%	6.31%	-1.92%
1st 2012	1.16%	2.27%	-1.11%	0.49%	2.24%	-1.75%
2nd 2012	-1.63%	1.27%	-2.90%	-1.46%	1.49%	-2.95%
3rd 2012	1.52%	1.33%	0.19%	-0.61%	1.55%	-2.16%
4th 2012	4.76%	8.30%	-3.54%	5.34%	7.02%	-1.68%
1st 2013	-0.16%	2.84%	-3.00%	1.08%	2.05%	-0.97%
2nd 2013	1.71%	3.58%	-1.87%	0.53%	2.97%	-2.44%
3rd 2013	3.59%	5.23%	-1.64%	3.34%	3.90%	-0.56%
4th 2013	3.53%	4.54%	-1.01%	3.44%	3.70%	-0.26%
1st 2014	0.88%	4.06%	-3.18%	0.17%	1.79%	-1.62%
2nd 2014	0.90%	4.81%	-3.91%	2.57%	3.71%	-1.14%
3rd 2014	3.89%	3.85%	0.04%	3.78%	5.51%	-1.73%
4th 2014	2.93%	5.67%	-2.74%	2.85%	4.72%	-1.87%
1st 2015	9.56%	7.04%	2.52%	4.29%	-1.94%	6.23%
2nd 2015	-4.30%	-1.20%	-3.10%	-3.36%	7.28%	-10.64%
3rd 2015	1.39%	-0.99%	2.38%	-1.19%	-2.72%	1.53%
4th 2015	9.78%	9.23%	0.55%	-7.77%	2.88%	-10.65%
1st 2016	-2.00%	-1.77%	-0.24%	-1.71%	-4.45%	2.74%
2nd 2016	0.78%	3.00%	-2.22%	-7.18%	0.09%	-7.27%
3rd 2016	11.08%	6.08%	5.00%	13.17%	-5.27%	18.44%
4th 2016	-0.88%	0.51%	-1.39%	2.73%	12.35%	-9.62%
1st 2017	4.70%	-4.24%	8.94%	4.40%	4.45%	-0.04%
2nd 2017	7.64%	12.99%	-5.35%	0.38%	6.21%	-5.83%
3rd 2017	2.43%	3.65%	-1.22%	-1.69%	2.12%	-3.81%
4th 2017	5.55%	4.88%	0.67%	-0.96%	1.34%	-2.30%
1st 2018	0.69%	2.10%	-1.41%	4.87%	1.38%	3.50%
2nd 2018	-2.22%	7.07%	-9.29%	0.49%	6.82%	-6.33%
3rd 2018	0.81%	1.11%	-0.30%	-0.18%	1.83%	-2.01%
4th 2018	3.93%	2.17%	1.76%	2.51%	2.72%	-0.21%
1st 2019	-1.11%	2.57%	-3.68%	2.49%	3.63%	-1.14%
2nd 2019	0.64%	3.28%	-2.64%	-0.90%	3.40%	-4.30%
3rd 2019	2.40%	4.91%	-2.51%	1.38%	1.47%	-0.09%
4th 2019	3.06%	4.50%	-1.44%	3.31%	3.54%	-0.23%
Average	1.65%	3.14%	-1.49%	0.67%	2.45%	-1.78%

Bold numbers indicate statistically significant results at the 1% level.

Table 4. Dividend Yield Strategy

Year	High Dividend Yield Portfolio			Low Dividend Yield Portfolio		
	Actual	Expected	Excess	Actual	Expected	Excess
1	-6.07%	5.72%	-11.07%	-4.64%	6.53%	-11.17%
2	-5.90%	5.05%	-10.95%	-5.85%	2.95%	-8.80%
3	-0.81%	9.30%	-10.11%	-4.14%	5.15%	-9.29%
4	0.45%	7.19%	-6.74%	-9.03%	2.77%	-11.80%
5	-9.94%	-1.43%	-8.51%	-15.02%	-4.37%	-10.65%
6	-12.47%	-2.35%	-10.12%	-18.83%	-6.79%	-12.04%
7	-5.21%	7.74%	-12.95%	-4.62%	2.78%	-7.40%
8	4.68%	14.71%	-10.03%	6.15%	11.77%	-5.62%
9	11.59%	19.18%	-7.59%	12.44%	17.99%	-5.55%
10	17.47%	24.16%	-6.69%	20.40%	25.47%	-5.07%
11	8.09%	12.34%	-4.25%	6.02%	14.56%	-8.54%
12	6.95%	9.90%	-2.95%	2.81%	11.59%	-8.78%
13	5.81%	13.17%	-7.36%	3.76%	12.30%	-8.54%
14	4.49%	13.74%	-7.25%	4.35%	12.11%	-7.76%
15	7.83%	16.05%	-8.22%	6.34%	13.59%	-7.25%
16	9.90%	19.95%	-10.05%	10.29%	15.94%	-5.65%
17	8.67%	16.19%	-7.52%	8.39%	12.62%	-4.23%
18	9.71%	17.41%	-7.70%	7.48%	12.36%	-4.88%
19	8.90%	18.64%	-9.74%	9.52%	13.10%	-3.58%
20	9.20%	17.26%	-8.06%	9.96%	14.71%	-4.75%
21	8.60%	18.39%	-9.79%	9.37%	15.73%	-6.36%
22	17.28%	21.37%	-4.09%	13.49%	12.00%	1.49%
23	12.08%	15.36%	-3.28%	7.56%	15.57%	-8.01%
24	9.58%	10.52%	-0.94%	2.59%	7.34%	-4.75%
25	16.43%	14.08%	2.35%	-8.03%	5.50%	-13.53%
26	4.87%	5.28%	-0.41%	-14.03%	3.00%	-17.03%
27	9.95%	9.48%	0.47%	-17.85%	-4.20%	-13.66%
28	19.64%	16.55%	3.10%	-3.49%	-6.74%	3.25%
29	8.98%	7.83%	1.16%	7.01%	2.73%	4.28%
30	15.68%	5.35%	10.33%	13.12%	11.62%	1.50%
31	22.54%	15.34%	7.20%	20.68%	17.74%	2.94%
32	13.89%	12.91%	0.99%	5.82%	25.12%	-19.30%
33	20.32%	17.28%	3.05%	2.13%	14.11%	-11.98%
34	16.31%	23.61%	-7.30%	2.60%	11.04%	-8.44%
35	6.45%	17.69%	-11.24%	2.71%	11.65%	-8.94%
36	4.83%	15.15%	-10.32%	4.22%	11.36%	-7.14%
37	3.21%	12.44%	-9.23%	7.69%	12.74%	-5.05%
38	1.41%	12.91%	-11.50%	5.31%	14.99%	-9.68%
39	4.27%	9.12%	-4.85%	3.92%	11.57%	-7.65%
40	5.86%	12.92%	-7.06%	5.48%	11.21%	-5.73%
41	4.99%	15.25%	-10.26%	6.28%	12.03%	-5.75%
Average	7.33%	12.99%	-5.60%	2.98%	10.08%	-7.09%

Bold numbers indicate statistically significant results at the 1% level.

Table 5. Absolute Performance Strategy

Quarter	High Absolute Performance Portfolio			Low Absolute Performance Portfolio		
	Actual	Expected	Excess	Actual	Expected	Excess
1st 2009	-0.97%	-1.26%	0.29%	-3.60%	-0.26%	-3.34%
2nd 2009	-2.97%	-1.40%	-1.57%	-3.32%	-0.39%	-2.93%
3rd 2009	-7.84%	-2.38%	-5.46%	-6.83%	-3.75%	-3.08%
4th 2009	9.02%	9.33%	-0.31%	5.17%	8.29%	-3.12%
1st 2010	-2.00%	-3.57%	1.57%	-3.18%	-1.60%	-1.58%
2nd 2010	-0.12%	2.71%	-2.83%	0.48%	3.03%	-2.55%
3rd 2010	-7.80%	-5.39%	-2.41%	-7.20%	-2.97%	-4.23%
4th 2010	-0.01%	-0.25%	0.24%	-1.57%	0.64%	-2.21%
1st 2011	-8.99%	-6.11%	-2.88%	-3.66%	-1.37%	-2.29%
2nd 2011	18.37%	13.53%	4.84%	4.15%	7.34%	-3.19%
3rd 2011	2.10%	4.77%	-2.67%	2.42%	3.37%	-0.95%
4th 2011	5.16%	6.74%	-1.58%	1.97%	4.34%	-2.37%
1st 2012	0.26%	2.23%	-1.97%	-0.77%	2.26%	-3.03%
2nd 2012	-0.51%	1.58%	-2.09%	-0.84%	1.29%	-2.13%
3rd 2012	-0.76%	1.63%	-2.39%	-0.96%	1.35%	-2.31%
4th 2012	4.10%	8.51%	-4.41%	5.97%	8.19%	-2.22%
1st 2013	0.40%	2.05%	-1.65%	0.06%	1.88%	-1.82%
2nd 2013	0.07%	3.98%	-3.91%	2.26%	3.46%	-1.20%
3rd 2013	4.02%	3.91%	0.11%	3.62%	4.96%	-1.34%
4th 2013	3.15%	3.71%	-0.56%	3.11%	4.37%	-1.26%
1st 2014	0.88%	4.06%	-3.18%	0.17%	1.79%	-1.62%
2nd 2014	0.90%	4.81%	-3.91%	2.57%	3.71%	-1.14%
3rd 2014	3.89%	3.85%	0.04%	3.78%	5.51%	-1.73%
4th 2014	2.93%	5.67%	-2.74%	2.85%	4.72%	-1.87%
1st 2015	9.56%	7.04%	2.52%	5.37%	-3.60%	8.97%
2nd 2015	-2.67%	-1.35%	-1.32%	-2.88%	8.34%	-11.22%
3rd 2015	1.39%	-2.28%	3.67%	0.58%	-1.50%	2.08%
4th 2015	9.42%	9.38%	0.04%	-6.80%	3.08%	-9.88%
1st 2016	-1.81%	-3.55%	1.74%	-1.38%	-2.95%	1.57%
2nd 2016	0.17%	2.71%	-2.54%	-3.37%	0.64%	-4.01%
3rd 2016	11.08%	6.08%	5.00%	4.40%	-1.40%	5.80%
4th 2016	0.12%	-0.30%	0.42%	2.55%	7.29%	-4.74%
1st 2017	4.70%	-4.24%	8.94%	1.98%	3.30%	-1.32%
2nd 2017	18.26%	13.43%	4.83%	-0.88%	4.24%	-5.12%
3rd 2017	1.87%	4.65%	-2.78%	-1.07%	2.14%	-3.21%
4th 2017	4.81%	6.59%	-1.78%	-1.31%	1.14%	-2.45%
1st 2018	-0.21%	2.06%	-2.27%	5.50%	1.18%	4.33%
2nd 2018	-1.10%	8.07%	-9.17%	-0.53%	7.99%	-8.52%
3rd 2018	-1.47%	1.41%	-2.88%	1.55%	1.66%	-0.11%
4th 2018	3.27%	2.17%	1.10%	2.79%	3.21%	-0.42%
1st 2019	-0.55%	1.78%	-2.33%	2.16%	4.69%	-2.53%
2nd 2019	-1.00%	3.68%	-4.68%	-0.90%	4.07%	-4.97%
3rd 2019	2.83%	3.59%	-0.76%	1.38%	1.47%	-0.09%
4th 2019	2.68%	4.50%	-1.82%	3.31%	3.54%	-0.23%
Average	1.92%	2.91%	-0.99%	0.43%	2.47%	-2.04%

Bold numbers indicate statistically significant results at the 1% level.

Table 6. Absolute Performance Strategy

Year	High Absolute Performance Portfolio			Low Absolute Performance Portfolio		
	Actual	Expected	Excess	Actual	Expected	Excess
1	-2.76%	4.29%	-11.07%	-8.58%	3.89%	-12.47%
2	-3.79%	1.98%	-5.77%	-8.16%	2.55%	-10.71%
3	-0.94%	6.09%	-7.03%	-4.36%	5.97%	-10.33%
4	-0.90%	3.08%	-3.98%	-4.73%	6.75%	-11.48%
5	-9.93%	-6.50%	-3.43%	-11.47%	-0.90%	-10.57%
6	-16.92%	-9.04%	-7.88%	-11.95%	-0.67%	-11.28%
7	1.57%	1.78%	-0.21%	-8.28%	3.64%	-11.92%
8	11.47%	11.94%	-0.47%	1.34%	9.98%	-8.64%
9	16.64%	18.93%	-2.29%	4.88%	13.68%	-8.80%
10	25.89%	27.27%	-1.38%	7.77%	17.31%	-9.54%
11	7.01%	15.32%	-8.31%	2.78%	11.26%	-8.48%
12	4.15%	12.18%	-8.03%	-0.60%	9.24%	-9.84%
13	3.09%	13.95%	-10.86%	3.40%	13.09%	-9.69%
14	3.23%	13.77%	-7.25%	4.23%	12.71%	-8.48%
15	3.81%	16.17%	-12.36%	7.33%	14.88%	-7.55%
16	8.59%	18.45%	-9.86%	11.91%	18.49%	-6.58%
17	7.64%	13.65%	-6.01%	9.05%	14.67%	-5.62%
18	8.12%	15.66%	-7.54%	9.16%	14.58%	-5.42%
19	8.95%	16.49%	-7.54%	9.47%	14.83%	-5.36%
20	8.82%	16.43%	-7.61%	9.63%	15.38%	-5.75%
21	8.60%	18.39%	-9.79%	9.37%	15.73%	-6.36%
22	17.28%	21.37%	-4.09%	14.57%	10.34%	4.23%
23	13.71%	15.21%	-1.50%	9.12%	14.97%	-5.85%
24	11.21%	9.08%	2.13%	5.92%	7.96%	-2.04%
25	17.70%	12.79%	4.91%	-3.73%	6.32%	-10.05%
26	6.33%	2.21%	4.13%	-10.48%	6.98%	-17.46%
27	9.17%	6.27%	2.91%	-10.97%	-0.73%	-10.25%
28	18.86%	14.63%	4.24%	-7.15%	-0.62%	-6.53%
29	9.56%	4.95%	4.62%	2.20%	3.59%	-1.39%
30	16.07%	4.25%	11.82%	5.56%	9.83%	-4.27%
31	34.16%	14.97%	19.19%	8.05%	13.43%	-5.38%
32	24.95%	13.54%	11.42%	2.58%	16.96%	-14.38%
33	29.64%	20.43%	9.22%	-1.28%	10.81%	-12.09%
34	24.73%	26.72%	-1.99%	2.24%	8.69%	-6.45%
35	5.37%	21.36%	-15.99%	2.59%	12.44%	-9.85%
36	2.03%	18.12%	-16.09%	5.21%	11.96%	-6.75%
37	0.49%	13.70%	-13.21%	9.31%	14.03%	-4.72%
38	0.15%	13.42%	-13.27%	5.97%	17.54%	-11.57%
39	0.25%	9.03%	-8.78%	5.60%	13.62%	-8.02%
40	4.55%	11.21%	-6.66%	5.43%	13.43%	-8.00%
41	3.96%	13.54%	-9.58%	5.95%	13.76%	-7.81%
Average	8.35%	12.12%	-3.79%	2.17%	10.30%	-8.13%

Bold numbers indicate statistically significant results at the 1% level.