# Dividends and REIT Investment

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## ABSTRACT

This study examines the effect of dividends on future Real Estate Investment Trust (REIT) returns from the perspective of an investor. Surprisingly, we find a significant *negative* relation between dividend yield and future REIT returns based on a REITs sample from 1980 to 2014. We identify that this negative effect on dividends is caused by excessive payouts of dividends that exceed cash availability. To further investigate the effect of excessive dividends, we propose a novel decomposition method, which divides total dividend into full-capacity and excess-capacity dividend yield based on the cash availability. We conclude that the excess-capacity dividend yield is an unfavorable dividend yield component of total return, because these REITs have poor past accounting, poor price performance, and even significant negative future returns. Finally, we propose to use excess yield-adjusted momentum strategy and accurately construct momentum portfolio. The enhanced momentum strategy improve momentum profit 1.5 time greater than conventional momentum strategy. Overall, our study suggests the existence of excess dividends in REITs and investors should exercise caution when evaluating REITs and their dividends.

**Keywords:** Real estate investment trust, dividend yield, excess dividend, cash availability, momentum strategy

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# Introduction

A dividend payout policy is a central concern for corporate managers and outside investors. Numerous studies attempt to explain corporate dividend policy and its impact on share values. Real Estate Investment Trusts (REITs) have a unique dividend policy because of statutory payout requirements, and dividend payouts are large compared to those of common stock. Many studies have examined the determinants of payout policy from the company perspective, while few studies have investigated the effect of dividends on share values from the perspective of the investor. Thus, we examine the relation between dividend and REITs returns and conclude that the dividend amounts paid by REITs are so excessive that REITs with high dividend yields have negative future returns. To isolate the excess dividend yield from total dividend yield, we propose a novel decomposition method based on the cash availability of each REIT. Additionally, we suggest an enhanced momentum strategy using excess yield-adjusted return.

After their establishment by Congress in 1960, REITs provide investors with the opportunity to own valuable real estate and achieve dividend-based income and total return. REIT investors enjoy benefits including stable dividend income, diversified portfolios, liquidity and transparency in listed stocks, and higher performance than common stocks. To qualify as a REIT, a corporation or trust must follow certain provisions of the Internal Revenue Code (IRS). The most important statutory provision is that the REIT must distribute at least 95% of its taxable income in the form of shareholder dividends to retain tax-preferenced REIT regulatory status.[1] Dividend payout requirements ensure that REITs typically pay large dividends compared to common stock, and investors consider REITs a valuable investment asset with stable dividend income.

[Insert Figure 1]

Figure 1 shows the performance and special characteristics of REIT stock dividends. This figure represents the time-series of cumulative REIT total return and the return component of capital gains and dividend income from 1980 to 2014. Despite the large decline that occurred during the subprime mortgage crisis from 2007 to 2008,

[1] In addition to the dividend payout restriction, a REIT must comply with three other provisions. First, at least 75% of a REIT's total assets must be invested in real estate, mortgage, cash, or federal government securities. Second, at least 75% of REIT's gross annual income must come from rents, mortgage interests, or sale of real estate. Third, the REIT must have at least 100 shareholders, and 50% of the share may be held by five or fewer shareholders.

the REIT market has exhibited dramatic growth. The value of one dollar invested in a REIT market portfolio in 1980 was worth $45.18 in 2014. Of the $45.18 portfolio value, only $10.07 was from capital gains while $35.11 was earned from dividend income. Because a significant portion of total return is from dividend income, we note the importance of dividends when analyzing the return behavior of REITs.

Early studies on REIT dividend, including Shilling, Sirmans, and Wansley (1986) and Lee and Kau (1987), postulate that the existence of dividend distribution requirements is an important constraint to REIT dividend policy. However, Wang, Erickson, and Gau (1993) find that REITs, on average, pay 165% of their taxable income as a dividend and reveal that REIT dividend policy is not constrained by distribution requirements. Bradley, Capozza, and Seguin (1998) also report that the average dividend payout is approximately twice that of net income and suggest that the dividend policy is more likely to depend on firms' fundamentals such as cash flow, leverage, and size rather than on the statutory dividend distribution threshold. In our sample from the period from 1980 to 2014, we confirm that REITs excessively pay dividends that are approximately double pretax income and the same amount of funds from operations on average. We suggest that statutory dividend requirements are not a constraint on payout policy, rather, we propose that the cash availability of a REIT is a realistic constraint.

Considering that REITs pay large dividends above statutory requirements, recent studies have attempted to explain dividend policy by decomposing dividends into two components. Hardin and Hill (2008) examine the determinants of dividends by incorporating an excess dividend component, which is common dividends paid minus the mandatory dividend payment, 90% or 95% of pretax income. The authors show that the payment of excess dividends is related to factors that imply reduced agency costs and higher excess funds from operations. Boudry (2011) proposes a new metric measuring the discretionary component of the dividend based on tax disclosure rather than GAAP disclosure in Hardin and Hill (2008), which eliminates the large GAAP-to-tax adjustments. The author shows that the amount of discretionary dividends is large, has considerable variation through time and across firms, and suggests that the motivation for paying discretionary dividends is dividend smoothing. In this paper, we propose a new decomposition method for total dividends based on cash availability and suggest that the excess-capacity dividend yield component mainly drives the negative effect of the total dividend yield on future return.

In this paper, we focus on the unique nature of dividends in REIT stocks from an investment perspective. The results can be summarized as follows. First, there is a negative relation between dividend yield and future REIT return. This negative relation contradicts the common knowledge from the common stock literature. Second, we suggest that the dividend yield in excess of available funds from operation, excess-capacity dividend yield, mainly drives the negative future return of high dividend yield REITs. Specifically, REITs with high excess-capacity dividend yields have poor past performance and negative future performance. Finally, we suggest the use of excess yield-adjusted return to construct momentum portfolio. Because this return adjustment accurately assesses past price performance without overestimating, the adjusted momentum portfolio exhibits salient improvement compared to conventional momentum portfolio.

Our study contributes to the REIT literature in three aspects. First, this is the first study to suggest the unfavorable effect of a dividend on future REIT returns from an investment perspective. The implications differ from those of Bradley, Capozza, and Seguin (1998), Kallberg, Liu, and Srinivasan (2003), Chou et al. (2013), and Chiang (2015) because these prior studies focus on the aggregate or contemporaneous relation between dividend and REIT return. Second, we propose a distinct decomposition method based on realistic constraint on cash availability. In previous literature, Hardin and Hill (2008) and Boudry (2011) decompose dividend into mandatory and discretionary components based on statutory payout requirements. However, Wang, Erickson, and Gau (1993), Bradley, Capozza, and Seguin (1998), and subsequent studies note that dividend requirements are less binding than it appears. Third, we propose a return adjustment to improve momentum strategy. Chui, Titman, and Wei (2003a) are the first authors to demonstrate the validity of momentum in REIT stocks. Although there are a number of studies on enhancing momentum strategy in common stocks, our study is the first to improve momentum strategy using the unique nature of dividends in REIT stocks. Overall, our results shed light on both dividend and momentum investment for REIT stocks.

# Data and Variable Construction

## *REITs Data*

We obtain REIT stock data from CRSP/Ziman Real Estate Database from January 1980 to December 2014. Our sample consists of all types of REITs including equity, mortgage, and hybrid types traded on NYSE, AMEX, and Nasdaq.[2] REIT stock market data such as monthly return, share price, shares outstanding, and the value-weighted REIT market index are retrieved from the CRSP/Ziman database. In addition, we acquire accounting variables such as common dividends, total assets, net income, funds from operations, and pretax income from the Compustat database. Following Fama and French (1992) and Chui, Titman, and Wei (2003), we require each REIT to have at least 24 consecutive return observations to be included in our dataset. Our final sample consists of 527 unique REITs with 55,840 firm-month observations over the 1982 to 2014 period.

## *Variable Construction*

We calculate REIT dividend yields at the end of month *t* by dividing the total common dividends (DVC, Compustat data item 21) per shares by share price at the end of the fiscal year. We use annual dividends because quarterly data are subject to potential biases from possible annual patterns in dividend payouts. Alternatively, we also retrieve cum-dividend return (*ret*) and ex-dividend return (*retx*) from the CRSP database for the calculation of monthly dividend income. From the definition of return, we decompose monthly total return (*ret*) into capital gain (*retx*) and dividend income (*ret-retx*).[3] With this decomposition, we can distinguish which part drives the change in monthly total return. Throughout this paper, we use the term dividend income to distinguish the component of monthly total return from the annual dividend yield. As discussed in Da, Jagannathan, and Shen (2015), the series of dividend income derived from CRSP and dividend yield from the Compustat database are highly correlated with a correlation of 0.98.

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[2] We include all types of REIT to obtain a larger sample for the pre-1993 period following Chui, Titman, and Wei (2003a); Chui, Titman, and Wei (2003b); Hung and Glascock (2008, 2010), and Price, Gatzlaff, and Sirmans (2012). For the period, most REITs are equity and comprise 77% of the sample. Specifically, 66% of the listed REITs were equity REITs in the pre-1993 period and 81% are equity REITs in the post-1993 period.

[3] The total return (*ret*) is the dividend income (*ret-retx*) plus capital gain (*retx*):

$$R_t = \frac{D_t}{P_{t-1}} + \frac{P_t - P_{t-1}}{P_{t-1}}$$

where $D_t$ is the dividend for month t; $P_{t-1}$ is the price at the end of month t-1.

In addition, we use funds from operations (FFO) to measure cash flow generated from REIT operations. Following Graham and Knight (2000), we define FFO as net income (NI, Compustat data item 172), excluding gain or loss on sales of property (SRET, Compustat data item 392), plus depreciation and amortization (DPRET, Compustat data item 393), minority interest income (MII, Compustat data item 49), and extraordinary items (SRET, Compustat data item 124)[4]. FFO is a widely used measure when evaluating REITs and other similar investment trusts[5]. Compared to GAAP net income, FFO is a more accurate measure because by not deducting depreciation and amortization and many one-time, non-recurring, non-cash revenues and expenses, it is a better representation of cash flows. Moreover, compared to cash flows from operations, FFO is more prospective measure because it accounts for cash flow and the recurring, non-cash revenues and expenses, which are important in evaluating REIT firms.

[Insert Table 1]

Table 1 illustrates the descriptive statistics for return and dividends in our samples. The first three columns represent total return and its two components of dividend income and capital ga*i*n. Consistent with the nature of dividends, dividend income is stable and positive in the sample period even during the 2008 real estate crash. Specifically, dividends account for 60% of total return in REIT stocks. This amount is significantly larger than the case of common stocks, for which dividend income comprises 8.6% of total return[6]. These differences in dividend income between REITs and commons stock are consistent with the notion that REIT has a mandate to distribute at least 90% of its taxable income in the form of shareholder dividend each year under IRS payout requirements. In the next three columns of Table 1, we calculate three alternative dividend payout ratios, dividends to net income, dividends to pretax income, and dividends to funds from operations. We exclude REITs with negative payout ratios such as REITs with negative earnings and positive dividends when calculating the payout ratio. The average amount of the payout ratio using pretax income and net income in column 5 and 6 reveals that REIT payout dividends, on average, are approximately twice the earnings. Wang,

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[4] If SRET and DPRET are missing, we use the alternative variables SPPIV and DPC, respectively.

[5] Since the National Association of Real Estate Investment Trusts (NAREIT) introduced the FFO concept in 1991, a large number of studies demonstrate the usefulness of using FFO compared to net income in valuation. See also Fields, Rangan, and Thiagarajan (1998), Gore and Stott (1998), Vincent (1999), Graham and Knight (2000), Stunda and Typpo (2004), Hayunga and Stephens (2009) and Ben-Shahar, Sulganik, and Tsang (2011).

[6] For common stock samples in the CRSP database, average total return, dividend income, and capital gains are 1.19%, 0.10%, and 1.09%, respectively.

Erickson, and Gau (1993) find that REITs pay 165% of their taxable income, and Bradley, Capozza, and Seguin (1998) also report that the dividend payout in their sample is approximately twice net income. Consistent with two earlier studies, REITs payout a greater percentage of dividends than net income and the amounts required to be paid out[7]. As discussed in the literature, REITs have the potential to pay more dividends than required by law because their annual cash flows exceed their taxable income.

The final dividend payout ratio is the dividend to FFO. In column 7 of Table 1, the average of the dividend to FFO is relatively smaller than the dividend to net income and dividend to pretax income. Because FFO added back net income to depreciation and amortization, which account for a significant portion of expenses in the REIT industry, it is natural that the dividend payout ratio using FFO has a lower value than the dividend payout ratio using net income. However, we infer that the average REIT pays a large dividend even when we evaluate the dividend payout ratio based on FFO. In the sample, the average REIT pays 98% of FFO, that is, the average REIT pays almost all of the cash flow generated from operations as a form of dividend. Moreover, the higher standard deviation of dividend to FFO indicates that many REITs pay out more than the cash earned from operations. We adopt FFO to calculate the dividend payout ratio because it is more likely to represent the realistic constraint on a REIT's ability to sustain its dividend payments to investors.

[7] The precise amount required to be paid out should be calculated using taxable income, but many studies proxy the taxable income as pretax income including Wang, Erickson, and Gau (1993) Lee and Slawson (2004) and Hardin and Hill (2008)

# REIT Return and Dividend Effect

## *Total Return and Dividend Effect in REITs and Common Stock*

Considering the dominance of dividend income in total return in the REIT industry, we investigate how dividends are related to REIT total returns and how this relation differs from common stock. We start by forming portfolios based on dividends. Specifically, we sort all REITs based on dividend measures and divide them into quintile portfolios at the beginning of each month. Then, we calculate the average monthly value-weighted holding period returns of each quintile portfolios. Because dividend amount alone is not comparable across firms, we scale total common dividends by three alternative variables; fiscal year-end market capitalization, total asset, and funds from operations. Thus, we obtain three dividend measures including dividend yield, dividend-to-assets, and dividend payout ratio.

Following the majority of the studies on REIT pricing models, we calculate abnormal returns using the Fama and French (1993) three-factor model along with the momentum factor suggested by Carhart (1997)[8]. The four-factor model is

$$R_{pt} - R_{ft} = \alpha_p + \beta_p\left(R_{m\,t} - R_{ft}\right) + s_p SMB_t + h_p HML_t + u_p UMD_t + \varepsilon_p$$

where $\left(R_{m\,t} - R_{ft}\right)$ is the excess return of the market, SMB is the difference between portfolios for small- and large-cap stocks, HML is the difference between a portfolio of high and low book-to-market stocks, and UMD is the difference between a portfolio of the highest performing stocks in the previous year less the worst performing stocks in the previous year.[9] For each quintile portfolio, we report monthly abnormal returns $\alpha_p$ along with raw portfolio returns.

[Insert Table 2]

[8] Peterson and Hsieh (1997) investigate whether the common risk factors in the returns on stocks and bonds explain the return on REITs. The authors show that equity REIT risk premiums are significantly related to the risk premiums of a market portfolio of stocks and the returns of mimicking portfolios for size and book-to-market equity factors in common stock returns. In addition, the authors suggest that the risk premiums on mortgage REITs are significantly related to the three stock market factors and two bond market factors in returns. After this paper, the Fama-French factor model is widely used in the REIT literature including Peterson and Hsieh (1997), Chui, Titman, and Wei (2003a), Chui, Titman, and Wei (2003b), Chiang (2007), Ooi, Webb, and Zhou (2007), Hung and Glascock (2010), and Ang, Nabar, and Wald (2013)

[9] We obtain Fama-French four-factor data including market, risk free, size, value, and momentum from the Kenneth French Data Library. http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Table 2 shows the results for value-weighted monthly returns on the portfolios sorted by three dividend measures. Panel A shows the dividend sorted portfolio for REITs while panel B shows the dividend sorted portfolio for the common stock samples. Panel A shows that the REIT with the highest dividend experiences a lower future returns than the REIT with the lowest dividend regardless of dividend measure. In Panel B, however, the effect of dividend is reversed for common stock; stocks with a higher dividend tend to have higher future returns than stocks with lower dividends. Traditional literature on dividend effects on security returns is classified as positive and irrelevant. Initially, Brennan (1970) suggests the tax-effect hypothesis that investors require higher before tax, risk-adjusted returns on stocks with higher dividend yields to compensate for higher taxation of dividend income relative to capital gain. Many subsequent empirical studies support this hypothesis including Litzenberger and Ramaswamy (1979), Litzenberger and Ramaswamy (1982), Gordon and Bradford (1980), and Elton, Gruber, and Rentzler (1983). Others, notably Black and Scholes (1974) and Miller and Scholes (1982), find no relation between equilibrium returns and dividend yield. None of these studies suggest the negative effect of dividend yields. Moreover, price multiples, such as dividend to price, book-to-price, and earning-to-price, used common prediction of positive subsequent returns as a valuation metric, as discussed in Fama and French (1998).

Although our results in Panel A show that the dividends are negatively related to the REIT returns, several studies also suggest the positive effect of dividends in REIT stocks consistent with the common stock literature. Kallberg, Liu, and Srinivasan (2003) support the viability of dividend pricing models for REIT stocks using the methodology of Campbell and Shiller (1988). Chiang (2015) demonstrates a positive predictive relation from aggregate dividend yields to aggregate return in REIT samples, which is consistent with Fama and French (1988). In addition, Bradley, Capozza, and Seguin (1998) suggest that dividend increase is related to contemporaneous REIT return based on a signaling-based explanation. Chou et al. (2013) propose that the market value of REIT total dividend is positive, which is consistent with agency cost theory. Compared to these studies, our result that dividends negatively predict REIT returns can be considered anomalous. However, our result is potentially different from previous studies in its approach because we focus on the investment perspective of the dividend effect on subsequent individual REIT returns not contemporaneous or aggregate return.

### *Total Return Decomposition and Dividend Effect in REITs*

Because REITs with high dividends anomalously have negative future returns, we conduct a detailed investigation into this unfavorable dividend effect for REITs with total return decomposition. We decompose the total return into dividend income and capital gain to examine the main cause of the negative subsequent return of high dividend portfolios. If the market unfavorably priced a high dividend-paying REIT, the price will decrease, and this negative capital gain could be the main driver of negative future return. Alternatively, if the REIT with a high dividend significantly reduces future dividends, the decreased dividend income might be the main reason for negative subsequent return.

[Insert Table 3]

Table 3 shows total return, dividend income, and capital gains of the REIT portfolios sorted by three dividend measures. For the portfolio sorted by dividend yield in Panel A, as the past dividend yield increases, the average dividend income monotonically increases while average capital gains decrease more sharply. Specifically, the magnitude of decreasing capital gains is significantly larger than the magnitude of increasing dividend income in the fourth and fifth dividend yield quintile. Therefore, total returns increase in the first three quintiles and significantly decrease in the last fourth and fifth quintiles. That is, markets evaluate the REITs with high dividend yields favorably to some extent, but the REITs with excessively high dividend yields are unfavorable. Moreover, the long-short portfolio constructed by buying REITs with high dividend yields and shorting REITs with low dividend yields generate statistically significant negative monthly returns of -0.54%. The results suggest that the negative effect of dividend yields on total return mainly due to the subsequent negative capital gains.

For dividend-to-asset and the dividend payout ratio in Panel B and Panel C, the dynamics of each return component have a similar pattern with the results presented in Panel A. However, the negative spread of capital gains between the high minus low dividend-to-asset quintile becomes smaller and is not statistically significant. Consequently, total return on the long-short dividend-to-asset portfolio is negative but insignificant. In the case of dividend payout ratio, the spread of both dividend income and capital gains between the high minus low dividend payout ratio is large and statistically significant. Thus, the total return on the dividend payout-sorted portfolio monotonically decreases and the long-short portfolio yields a significant negative monthly return of -0.57%.

The only difference among the dividend yield, dividend-to-asset, and dividend payout ratio in Table 3 is the choice of denominator; that is, price, total asset, and funds from operation, respectively. However, the effect of dividends become weaker when we use total assets to normalize the dividend. Note that the rate of capital gains corresponds to the change in price, the choice of price as a denominator of a dividend potentially affects subsequent capital gains. Moreover, the result of a distinct monotonic decreasing trend on total portfolio return sorted by dividend payout ratio emphasizes the credibility of FFO as the reference point. In the next section, we conduct a more detailed investigation of the dividend yield effect on REIT returns together with price changes and FFO.

## Components of Dividend Yield

### *Dividend Decomposition*

We focus on two stylized facts documented in the previous section. First, the future returns of REITs increase with dividend yield to some extent but sharply decrease when the dividend yield is excessively large. Second, the dividend payouts measured by FFO consistently predict negative subsequent returns. Based on these two findings, we question whether the dividend can be assessed differently depending on how it is decomposed into favorable and unfavorable parts. We investigate this possibility by decomposing the dividend based on funds from operation. We hypothesize that dividends paid within the REIT's capacity have positive expected returns while dividends paid in excess of the REIT's capacity have negative expected returns.

Several studies suggest dividend decomposition to investigate the characteristics of REIT payout policy. Downs, Gu, and Patterson (2000) is the first study to decompose REIT dividend into income and return-of-capital distributions. The income component is distributed from net income. The capital component is any portion distributed in excess of net income, which is considered a return of capital invested. Considering the IRS payout requirements of 90% of taxable income, Hardin and Hill (2008) and Boudry (2011) divide dividends into mandatory and discretionary dividends. Hardin and Hill (2008) proxy taxable income as pretax income and define excess dividends as common dividends paid minus mandatory dividend payments, 90% of pretax income. Boudry (2011) notes the potential bias of using pretax income as a proxy of taxable income and suggests a more accurate discretionary dividend component by examining the tax characteristics of dividends. These two studies provide useful insight into the characteristics of dividend policy from the manager's perspective; however, this paper focuses on the investor's perspective.

We suggest dividend decomposition based on the actual cash flow generated from annual operations, FFO, which is a more realistic constraint on dividend payout policy. Wang, Erickson, and Gau (1993), Bradley, Capozza, and Seguin (1998), and subsequent studies demonstrate that 90% of taxable income restriction is less binding than it appears. In our sample from 1980 to 2014, the average dividend payout ratio is 196% of pretax income and 98% of FFO. In other words, the average REIT manager has considerable discretion over 90% of taxable income and pay almost all of their cash flow earned in the form of dividends. We suggest that actual binding constraint for dividend payout is cash availability rather than IRS requirements. Dividend decomposition based on the profitability measure resembles the use of net income by Downs, Gu, and Patterson (2000). However, net income understates the ability of REITs to generate operating cash flow because of depreciation expense, which is added back to the FFO calculation.

Thus, we decompose total dividend yield into full-capacity dividend yield and excess-capacity dividend yield based on funds from operation (FFO).[10] The full-capacity dividend component reflects dividends fully distributed from FFO and assuming that all of the cash flow generated from operations is distributed. The excess-capacity dividend component is defined as dividend paid in excess of the full-capacity dividend. Both full-capacity yield and excess-capacity dividend yield are calculated using each dividend component and the share price at the fiscal year-end.

### *Portfolio Sorts of Dividend Components from Decomposition*

We analyze the portfolio sorted based on full-capacity and excess-capacity dividend yield decomposed from total dividend. At the end of each month, we sort stock into quintiles based on the yields of each dividend component. We then compute the average monthly value-weight portfolio returns in the subsequent month. To adjust for risk, we consider the Fama-French four-factor model.

[Insert Table 4]

Table 4 shows the performance of quintile portfolios sorted based on the full-capacity dividend yield and excess-capacity dividend yield. In Panel A, we find that average total returns, dividend income, and capital gain increase with the full-capacity dividend yield. Although the positive total return and capital gain spread of long-short portfolios are not statistically significant, we identify the increasing patterns that contrast sharply with the distinct decreasing pattern in the total dividend sorted portfolio. In Panel B, we calculate the decreasing average total return and capital gain while increasing dividend income as excess-capacity dividends increase. This result mirrors the result of the total dividend sorted portfolio. Because of the decreased positive spread of dividend income and increased negative spread of capital gains, the long-short total return of -0.86% for the excess-capacity dividend yield sorted portfolio is remarkably larger than -0.54% of the total dividend yield sorted

[10] The appendix also reports the results of dividend decomposition into mandatory and discretionary dividends based on 90% of pretax income, which is suggested in Hardin and Hill (2008).

portfolio. The results in Table 4 suggest that the negative effect of dividends on the future return due to the dividend paid in excess of the cash availability of REIT, while the dividend paid from the REIT fully covered by cash availability has a positive effect on the subsequent return.

[Insert Table 5]

Table 5 shows abnormal returns and the factor loadings of the Fama-French four-factor model for total dividend yield and its components, full-capacity and excess-capacity dividend yield. For total dividend yield, the results show that REITs with higher dividend yields are typically small and value stocks. Similar to the characteristics of total dividend, the REITs with higher full-capacity dividend yields tend to be small and value stocks. However, the REITs with higher excess-capacity dividend yields are more likely to be large and growth stocks. Overall, the inverse characteristics between full and excess-capacity dividend yields are salient not only for risk-adjusted return but also for their factor loadings of the Fama-French four-factor model. These inverse relationships are also reported in the dividend payout policy study of Boudry (2011), who decomposes dividends into discretionary and non-discretionary components based on dividend tax characteristics.

[Insert Table 6]

Table 6 provides descriptive sample statistics for five portfolios sorted by total, full-capacity, and excess-capacity dividend yields. For this table, the statistics of interest are computed as of the end of each formation month and averaged over the sample years. The dividend-related statistics in the first three columns naturally do not show significant differences in direction along the total dividend yield or its components but difference occurs for deviation. For full-capacity dividend yield quintiles in Panel B, the deviation of dividend yield is smaller while the deviation of dividend to asset is greater. In contrast, for excess-capacity dividend yield quintiles in Panel C, we find larger deviations for dividend yield and smaller deviations for dividends to assets. This implies that the increasing full-capacity dividend yield is mainly caused by increasing dividends while the increasing excess-capacity dividend yield is more likely to be caused by decreasing prices in the denominator. From the investor’s perspective, the full-capacity dividend yield more appropriately captures the positive dividend effect.

In the next four columns, we present the EPS statistics and the past return components of dividend-sorted portfolios. In Panel A, for total dividend quintile portfolio, the REITs with higher dividend yields tend to have higher EPS but lower past returns. It is natural that REITs with higher dividend yields have higher past accounting performance. Although the lower past price performance assessed in the market does not correspond to this higher past accounting performance, the lower past price can be related to the higher dividend yield, which is defined as dividend divided by past price. Given the fact that momentum phenomena exist, high dividend yield with a lower price for loser REIT stock could be assumed to drive negative subsequent returns of dividend-yield sorted portfolios. However, because contradicting past accounting and price performance does not properly explain future expected return, we separately examine each component of dividend yield decomposed in the previous section.

When we decompose dividend yield, the EPS statistics and past return components clearly indicate why the difference in performance occurs between full-capacity and excess-capacity dividend yields. In Panel B, the REITs with high full-capacity dividend yields have higher past accounting performance and higher price performance. These superior past performances allow the REIT to pay out more dividends and have a higher dividend yield. Additionally, the higher expected return of a higher full-capacity dividend yield portfolio correspond to both earnings and price momentum, which are discussed in Chan, Jegadeesh, and Lakonishok (1996). In contrast, in Panel C, the REITs with excess full-capacity dividend yields show lower past accounting performance and lower past price performance.[11] These inferior past performances are consistent with the negative expected return of excess-capacity dividend yield portfolios. Thus, these results show salient inverse effects on expected return between the components of dividend yield decomposed by cash availability. Overall, we summarize that higher full-capacity dividends are more beneficial to investors while higher excess-capacity dividends are harmful to investors from the perspective of future expected return. Thus, high dividend yields with high excess-capacity have an illusory nature that mainly drives negative future REIT returns. Therefore, investors should disentangle dividend yield by its composition.

[11] This result is inconsistent with Hardin and Hill (2008), who argue that excess dividends above mandatory requirements are related to strong operating performance measured by excess funds from operations. However, we suggest that excess funds from operations do not properly gauge the operating performance of a REIT because this measure excludes 90% of pretax income from FFO by definition.

### *Cross-Sectional Test of Dividend Components from Decomposition*

This section examines the relation between dividend components and future REIT performance using a multivariate regression approach. Specifically, we perform multivariate analysis based on annual data by estimating the following predictive regressions:

$$r_{i,t+1} = \alpha_i + \beta_1 DivYield_{i,t} + \beta_2 Beta_{i,t} + \beta_3 Size_{i,t} + \beta_4 Mom_{i,t} + \beta_5 Rev_{i,t} + \beta_6 Term_{i,t} + \beta_7 Def_{i,t} + \varepsilon_{i,t+1}$$

where dependent variable $r_{i,t+1}$ is the return on REIT $i$ in year $t$+1, and $DivYield$ represents the main variable to test various dividend yields including total, full-capacity, and excess-capacity dividend yields.[12] Additionally, we choose the common factors that explain the REIT return as a control variable. The control variables are included: $Beta_t$ is beta for REIT market in year t, $Size$ is market capitalization, $Mom_{i,t}$ is momentum factor defined as cumulative return for the past 12 months skipping the most recent month, $Rev_{i,t}$ is a reversal factor defined as the past one-month return, $Term$ is the term spread defined as the difference between the long-term yield on government bonds and the Treasury bill, $Def$ is the default spread defined as the spread between BAA and AAA-rated corporate bonds, and $\varepsilon_{i,t}$ captures the deviation of the realized return from its expected value. We estimate all of our panel regressions with two-way clustered standard errors by firm and year.[13]

[Insert Table 7]

Overall, the main results in Tables 7 are consistent with the results from the portfolio sorting analysis in the previous sections. Models 1 to 4 report the results for the simple regression model without control variables, and models 5 to 8 report the results for regressions with the control variables. Our first model specification begins with an investigation of the relationship between total dividends and future REIT returns. That is, we put total dividend yield in the $DivYield_{i,t}$ variable. In model 1, the coefficient of total dividend is not significant but has negative value. After controlling for other REIT characteristics in model 5, the coefficient of total dividend

[12] In the appendix, we present the cross-sectional regression test with mandatory and discretionary dividend yields.

[13] Petersen (2009) demonstrates that the standard errors of Fama-MacBeth are biased in the presence of a firm effect and have greater bias when the panel is unbalanced. Because our sample of REITs is more likely to exhibit unbalanced panel, we perform panel regression rather than Fama-MacBeth regression.

is -8.97 and statistically significant at the 1% level. The direction of the coefficient is consistent with the results presented in Table 3 that a high dividend yield predicts a negative subsequent return, even after controlling for beta, size, momentum, and reversal as well as term spread and default spread. Again, this result contradicts the previous studies of Fama and French (1988) and Chiang (2015), who suggest a positive predictive relation from aggregate dividend yield aggregate returns for common stock and REIT stock, respectively.

We then put full-capacity and excess-capacity dividend yield on $Div\ Yield_{i,t}$ separately to test whether the decomposition of dividend yield can disentangle the effect of dividend yield as a favorable and unfavorable part of future REIT returns. The model 2 estimates show a large and significant positive coefficient of 12.81 on full-capacity dividend yield while the model 3 estimates show a significant negative coefficient of -11.40 on excess-capacity dividend yield. Both coefficients are statistically significant at the 1% level. These coefficients are robust to the control of the REIT characteristic. In model 6 and 7 with control variables, the coefficients on the full-capacity and excess-capacity dividend yields are 9.49 and -11.22 with statistical significance at the 5% and 1% levels. This reversed effect of each dividend component on future REIT return is consistent with the results in Table 4. The cross-sectional regression results show that dividend yield decomposition can help investors to differentiate between the beneficial and detrimental parts of dividend yield and to evaluate the quality of the dividend yield.

Our final cross-sectional test uses both full-capacity and excess-capacity dividend yield in the regression. Model 4 shows that the results exhibit consistent direction with univariate analysis; full-capacity dividend yield has a positive coefficient while excess-capacity dividend yield has a negative coefficient. Because the sum of full-capacity and excess-capacity dividend yields should equal total dividends, which has a negative coefficient, the significance of the positive coefficient of full-capacity dividend yield is weaker than the negative coefficient of the excess-capacity dividend yield. We report the coefficient of the same regression with the control variable in model 8. The results mirror those of regression without control variables. Overall, the results of cross-sectional regression controlling for the effect of other REIT attributes are consistent with the previous result of portfolio sorts. We conclude that dividend decomposition based on cash availability disseminates the dividend yield. Specifically, the high dividend yield composed with high excess-capacity dividend yield drives negative future REIT returns. Thus, dividend investors should be cautious when assessing dividend yield alone because the future return varies depending on the dividend yield composition.

## Momentum Investment in REITs

### *Total Return Adjustments with Dividend Yield Decomposition*

This section addresses the assessment of total return as a measure of past performance. By definition, total return is the sum of dividend yield and rate of return on capital gains. We further divide total return by the sum of full-capacity dividend yield, excess-capacity dividend yield, and capital gains as follows:

$$\begin{aligned} Total\ Return_t &= Dividend\ Yield + Capital\ Gain \\ &= Full\ Capacity\ Dividend\ Yield + Excess\ Capacity\ Dividend\ Yield + Capital\ Gain \end{aligned}$$

Note that this excess-capacity dividend yield is an illusory and unprofitable measure for dividends among the components of total return. As we discussed earlier, REITs with higher excess-capacity dividend yields typically have lower past accounting performance and lower past price performance. If dividend investors choose REITs with high dividend yields mostly composed of excess-capacity dividend yields, investors will invest in poor performing loser REITs with negative future performance. This concern is related to dividend investment and momentum investment because total return can be inflated by high excess-capacity dividend yields of poor performing REITs. Similar to dividend yield, we hypothesize that high past total returns composed mostly of high excess-capacity dividend yields have worse future momentum profit. Thus, to accurately evaluate past price performance, we suggest excess yield-adjusted return defined as deducting unfavorable excess-capacity dividend yield from total return as follows:

$$Excess\ Dividend\ Adjusted\ Return_t = Total\ Return - Excess\ Capacity\ Dividend\ Yield$$

By using excess yield-adjusted returns, we attempt to avoid the possibility that REITs with poor performance magnify their return by excessively increasing dividends over their cash availability.

We construct momentum strategy to test how the components of total return in the past performance calculation affect momentum profits. We follow the conventional method described in Jegadeesh and Titman (1993), Chui, Titman, and Wei (2003a), and Hung and Glascock (2008), (2010). We construct three versions of the momentum portfolio by choosing formation period return as total return, ex-dividend return, and excess yield-adjusted return. Specifically, we from the monthly winner and loser portfolio based on the past six-month returns for three alternative specifications. Next, we form monthly zero-cost long-short momentum portfolios by entering a long position in winner portfolios and a short position in loser portfolios and hold this momentum portfolio from 1 to 12 months. We skip one month between formation and holding periods to avoid bid-ask bounce and microstructural effects.

[Insert Table 8]

Table 8 shows the statistics for returns of total return, ex-dividend returns, and excess yield-adjusted return momentum portfolios. Panel A reports the basic results for the total return momentum portfolio. The winner portfolios show economically and statistically significant large returns from 1.13% to 1.26% depending on whether holding is from 1 to 12 months. On the other hand, the loser portfolio shows smaller returns than winner portfolios, from 0.59% to 0.73% over the subsequent 1 to 12 months. The long-short momentum portfolio returns are significantly positive from 0.47% to 0.70% depending on the holding period. Focusing on the conventional winner minus the loser momentum portfolio of a 6/1/6 strategy, the basic total return momentum portfolio exhibits 0.59% of monthly raw return, which is significant at the 5% level. The abnormal return for a basic momentum long-short portfolio is 0.41%, but less significant because a large part of momentum return is explained by the Carhart (1997) factor in the Fama-French four-factor model. Overall, the result is consistent with Chui, Titman, and Wei (2003a), who first suggest that the momentum profit also exists in the REIT industry.

For comparison, we report ex-dividend return momentum in Panel B. The purpose of testing ex-dividend return momentum strategy is to examine whether the use of past total dividend information is valid for momentum strategy performance. Thus, we determine winner and loser portfolios by past six-month ex-dividend return without considering any of the past total dividend information. For ex-dividend return momentum strategy, the winner portfolios have significant and larger return than the loser portfolio over 12 months. For the conventional 6/1/6 strategy, the raw return of the winner minus the loser portfolio is 0.61%, which is significant at the 5% level, and the abnormal return is 0.43% and significant at the 10% level. Overall, the performance of the ex-dividend return momentum is slightly improved compared to the basic total return momentum strategy, but the amount of improvement is not economically large to implement.

Panel C shows the suggested portfolio returns of excess yield-adjusted return momentum. We construct the momentum portfolio using the past six-month excess yield-adjusted return; that is, total return minus excess-capacity dividend yield. The winner portfolio returns are significantly larger than the loser portfolio return throughout the holding periods. The winner minus loser momentum portfolios have economically and statistically significant returns of 0.64% to 0.82% over 12-month holding periods. The alpha of winner minus loser portfolio also has statistically significant positive values of 0.46% to 0.75%. For a conventional 6/1/6 strategy, the winner minus loser portfolio has a significant and positive monthly alpha of 0.54%. Compared to other 6/1/6 strategies in Table 8, the alpha of the adjusted momentum strategy is 1.31 and 1.25 times larger than basic total return momentum and ex-dividend return momentum portfolio, respectively. The enhanced performance is greatest for the first month after formation, which is 1.5 times larger than normal momentum strategy, and the return difference is 0.27% per month. Throughout the one to 12 month holding periods, there are salient improvements in momentum strategy by assessing past performance with excess yield-adjusted return. This improvement comes from avoiding possible overestimation of past performance from the higher unfavorable total return component, excess-capacity dividend yield, which predicts negative future return. Thus, we conclude that investors should notice the existence of excess-capacity dividend parts when they evaluate dividend policy and when assessing the past performance of REITs.

## Conclusion

This study examines the effect of the dividend on future REITs returns from the investment perspective. Based on a REIT sample from 1980 to 2014, we find that REITs with high dividend yields have a significant negative future return. Specifically, the return for a long-short quintile portfolio sorted by dividend yield exhibits -0.54% per month. Because REITs payout large amounts of dividend over their cash availability, we decompose total dividend into full-capacity dividend yield and excess-capacity dividend yield based on whether dividends paid are within or exceed the available funds from operations, respectively. The full-capacity and excess-capacity dividend yields are opposite in nature for past and future performance. Particularly, REITs with high excess-capacity dividend yields have poor past accounting, poor price performance, and even significant negative future returns. The long-short quintile portfolio sorted by past excess-capacity dividend yield has a negative future return of -0.86% per month. Finally, we suggest the excess yield-adjusted return for gauging past price performance. The adjusted momentum portfolio formed by excess yield-adjusted return improves future performance 1.5 times compared to basic momentum strategy.

Our study suggests a cautious approach to dividend and momentum investing. First, dividend investors should notice that higher dividend incomes in REIT stocks do not guarantee the performance of dividend investment. Based on common investment knowledge, stocks with higher dividend yields, or dividend-to-price ratios, have higher subsequent returns as value stocks. However, this prediction is reversed in the REIT industry where REITs with excessively high dividend yields exhibit strong negative future returns. Second, momentum investors should be conscious of possible overestimates in past return performance. The overestimates can be caused by excess capacity dividend yield in the total return component because REITs with poor past performance pay excessive dividends over their cash availability to distract momentum investors. Overall, investors should be aware of the existence of excess dividends in REITs and exercise caution when evaluating REITs and their dividends.

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**Figure 1. Time Series of REIT Return**

This figure shows the times series of daily total return and its components of dividend income and capital gains from 1980 to 2014. At the beginning of the January 1980, we assume that $1 is invested in the value-weighted portfolio of all REITs. The light shaded area and dark shaded area represent cumulative capital gains and dividend income, respectively. The capital gain (*retx*) is daily ex-dividend return retrieved from the CRSP/Ziman database. The dividend income is defined as the difference between daily total return (*ret*) minus daily cum-dividend return (*retx*) from the CRSP/Ziman database. The sum of cumulative capital gains and dividend income is the total return (*ret*) from the CRSP/Ziman database and is displayed in a line.

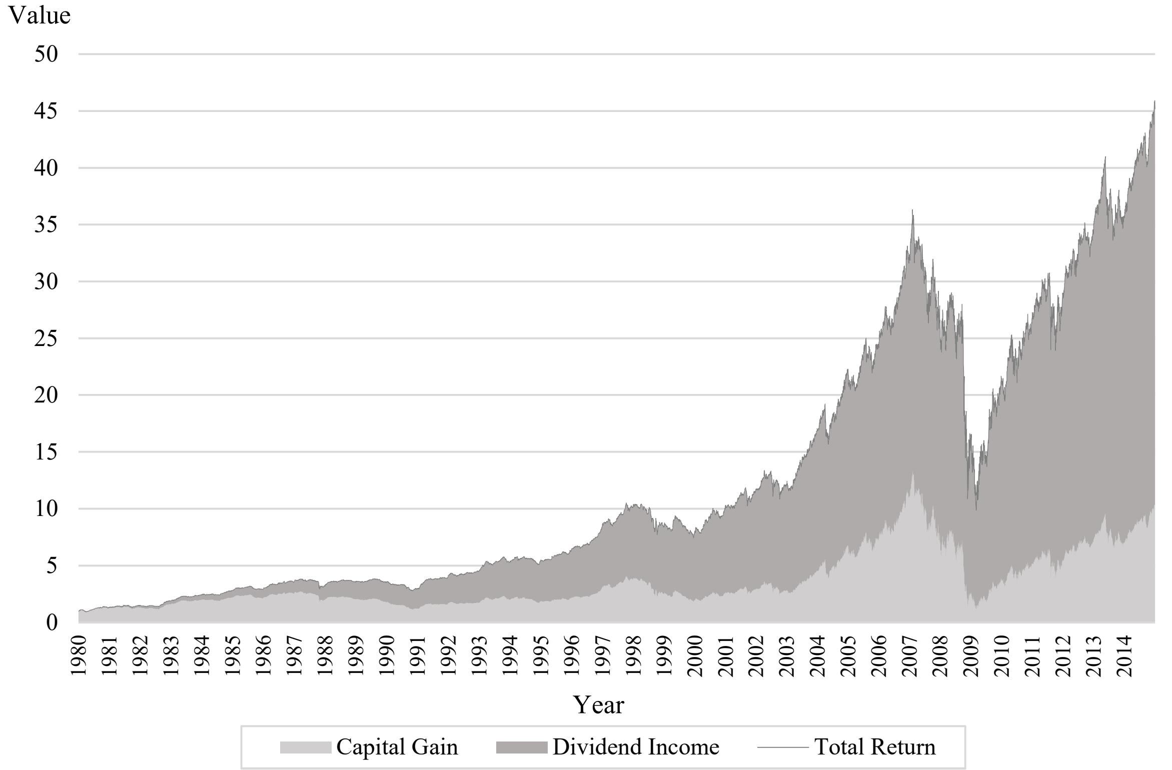

**Table 1. Descriptions for REITs Returns and Dividend Payout Ratios**

This table provides summary statistics for our final sample of 527 REITs with monthly stock returns and dividend information retrieved from the CRSP/Ziman and Compustat databases. The monthly total return, capital gain, and dividend income are defined as monthly total return, ex-dividend return, and the difference in return between total return and ex-dividend return. The dividend is defined as total common dividend per shares. The pretax income is defined as net income plus income taxes. The FFO is defined as net income, excluding gain or loss on sales of property, plus depreciation and amortization, minority interest income, and extraordinary items.

| Year | Total Return | Dividend Income | Capital Gain | Dividend to Net Income | Dividend to Pretax Income | Dividend to Funds from Operation | Number of Firms |
|---|---|---|---|---|---|---|---|
| Panel A: Year-by-year Average | | | | | | | |
| 1980 | 2.28% | 0.80% | 1.48% | 128% | 128% | 91% | 49 |
| 1981 | 1.41% | 0.77% | 0.63% | 145% | 139% | 94% | 75 |
| 1982 | 2.56% | 0.84% | 1.72% | 110% | 108% | 85% | 74 |
| 1983 | 2.14% | 0.70% | 1.44% | 126% | 130% | 89% | 74 |
| 1984 | 1.44% | 0.79% | 0.65% | 127% | 126% | 97% | 71 |
| 1985 | 0.64% | 0.80% | -0.16% | 114% | 113% | 96% | 71 |
| 1986 | 1.65% | 0.76% | 0.89% | 119% | 115% | 93% | 77 |
| 1987 | -0.75% | 0.81% | -1.56% | 153% | 154% | 108% | 105 |
| 1988 | 0.98% | 0.82% | 0.16% | 158% | 160% | 114% | 119 |
| 1989 | -0.08% | 0.78% | -0.85% | 157% | 158% | 102% | 124 |
| 1990 | -1.35% | 0.90% | -2.25% | 194% | 194% | 106% | 125 |
| 1991 | 2.79% | 0.82% | 1.97% | 164% | 164% | 119% | 124 |
| 1992 | 0.90% | 0.73% | 0.16% | 157% | 157% | 107% | 143 |
| 1993 | 1.40% | 0.61% | 0.79% | 235% | 235% | 138% | 145 |
| 1994 | 0.19% | 0.64% | -0.45% | 337% | 335% | 173% | 193 |
| 1995 | 1.45% | 0.66% | 0.79% | 441% | 432% | 189% | 231 |
| 1996 | 2.58% | 0.62% | 1.95% | 233% | 233% | 117% | 229 |
| 1997 | 1.49% | 0.52% | 0.97% | 194% | 194% | 111% | 214 |
| 1998 | -1.48% | 0.56% | -2.05% | 212% | 212% | 112% | 219 |
| 1999 | -0.46% | 0.67% | -1.12% | 273% | 274% | 130% | 224 |
| 2000 | 2.03% | 0.68% | 1.35% | 140% | 141% | 68% | 216 |
| 2001 | 1.20% | 0.63% | 0.58% | 118% | 115% | 56% | 200 |
| 2002 | 0.42% | 0.58% | -0.16% | 118% | 121% | 57% | 190 |
| 2003 | 2.83% | 0.58% | 2.25% | 139% | 139% | 72% | 186 |
| 2004 | 2.49% | 0.52% | 1.97% | 140% | 139% | 70% | 184 |
| 2005 | 0.80% | 0.46% | 0.34% | 128% | 136% | 68% | 198 |
| 2006 | 2.54% | 0.44% | 2.10% | 173% | 174% | 77% | 206 |
| 2007 | -1.44% | 0.45% | -1.89% | 158% | 154% | 71% | 188 |
| 2008 | -3.10% | 0.57% | -3.67% | 138% | 129% | 70% | 160 |
| 2009 | 2.77% | 0.57% | 2.20% | 121% | 121% | 56% | 149 |
| 2010 | 2.20% | 0.61% | 1.58% | 142% | 151% | 59% | 152 |
| 2011 | 0.74% | 0.38% | 0.35% | 241% | 234% | 79% | 163 |
| 2012 | 1.59% | 0.38% | 1.21% | 248% | 255% | 89% | 169 |
| 2013 | 0.35% | 0.37% | -0.02% | 220% | 213% | 80% | 179 |
| 2014 | 2.05% | 0.38% | 1.66% | 219% | 205% | 88% | 203 |
| Panel B: Whole Sample Period Statistics | | | | | | | |
| Average | 1.09% | 0.65% | 0.43% | 197% | 196% | 98% | 527 |
| Std. Dev. | 10.86% | 1.93% | 10.92% | 240% | 230% | 88% | |

**Table 2. Performance of Dividend-sorted Portfolio for REIT Stocks and Common Stocks**

This table compares the performances of dividend sorted portfolio of REIT stocks and common stocks. At the beginning of each month, we sort all REITs and stocks based on dividend measures and divide them into quintile portfolios. Then, we calculate the average monthly value-weighted holding period returns of each quintile portfolios. We calculate abnormal returns using the Fama and French (1993) three-factor model along with the momentum factor suggested by Carhart (1997). We calculate dividend yields at the end of month t by dividing the total common dividends per shares by share price at the end of the fiscal year. The dividend payout ratio is defined as dividend over FFO. The FFO is defined as net income, excluding gain or loss on sales of property, plus depreciation and amortization, minority interest income, and extraordinary items

| | Dividend Yield | | Dividend/Total Asset | | Dividend Payout Ratio | |
|---|---|---|---|---|---|---|
| Quintile | Return | FF4 α | Return | FF4 α | Return | FF4 α |
| | | | Panel A. Value-weighted REITs Portfolio Returns | | | |
| Low | 0.96 | -0.08 | 1.12 | 0.04 | 1.28 | 0.17 |
| | (3.35) | (-0.38) | (3.80) | (0.19) | (4.44) | (0.84) |
| 2 | 1.16 | 0.13 | 1.03 | -0.11 | 1.22 | 0.10 |
| | (4.68) | (0.67) | (3.53) | (-0.52) | (4.63) | (0.51) |
| 3 | 1.18 | 0.18 | 1.13 | 0.04 | 1.08 | 0.07 |
| | (4.66) | (0.97) | (4.53) | (0.20) | (4.31) | (0.37) |
| 4 | 0.87 | -0.06 | 0.96 | -0.05 | 0.95 | -0.04 |
| | (3.33) | (-0.30) | (3.75) | (-0.25) | (4.06) | (-0.21) |
| High | 0.42 | -0.69 | 0.99 | 0.06 | 0.71 | -0.28 |
| | (1.37) | (-2.98) | (4.52) | (0.33) | (2.91) | (-1.47) |
| High-Low | -0.54 | -0.60 | -0.13 | 0.01 | -0.57 | -0.45 |
| | (-2.08) | (-2.26) | (-0.57) | (0.05) | (-2.80) | (-2.18) |
| | | | Panel B. Value-weighted Common Stock Portfolio Returns | | | |
| Low | 0.90 | -0.18 | 1.04 | -0.38 | 1.06 | -0.17 |
| | (3.40) | (-1.81) | (3.61) | (-2.75) | (3.89) | (-1.58) |
| 2 | 1.02 | -0.06 | 1.13 | 0.00 | 1.03 | -0.01 |
| | (4.45) | (-0.57) | (4.22) | (-0.04) | (4.22) | (-0.09) |
| 3 | 1.07 | 0.00 | 1.06 | 0.10 | 1.07 | -0.02 |
| | (5.00) | (0.04) | (4.36) | (1.12) | (4.84) | (-0.25) |
| 4 | 1.15 | 0.14 | 0.94 | -0.08 | 1.03 | 0.07 |
| | (5.49) | (1.62) | (4.51) | (-0.99) | (5.19) | (0.81) |
| High | 1.11 | 0.00 | 1.09 | 0.11 | 1.10 | 0.05 |
| | (5.20) | (0.04) | (6.16) | (1.16) | (5.98) | (0.54) |
| High-Low | 0.22 | 0.18 | 0.05 | 0.49 | 0.04 | 0.22 |
| | (1.06) | (1.03) | (0.25) | (2.77) | (0.21) | (1.40) |

**Table 3. Performance of Dividend-sorted REIT Portfolio with Return Components**

This table presents the return components of dividend sorted portfolio of REIT stocks. At the beginning of each month, we sort all REITs and stocks based on dividend measures and divide them into quintile portfolios. Then, we calculate the average monthly value-weighted holding period returns of each quintile portfolios. We calculate abnormal returns using the Fama-French four-factor model. We define dividend yields by dividing the total common dividends per shares by share price. The dividend payout ratio is defined as dividend over FFO. The total return (ret), capital gain (retx), and dividend income (ret-retx) are retrieved from CRSP database.

| | Raw Return | | | Fama-French 4-factor Alpha | | |
|---|---|---|---|---|---|---|
| Quintile | Total Return | Dividend Income | Capital Gain | Total Return | Dividend Income | Capital Gain |
| | | | Panel A. Portfolio Sorted by Dividend Yield | | | |
| Low | 0.96 | 0.31 | 0.65 | -0.08 | -0.05 | -0.39 |
| | (3.35) | (15.60) | (2.26) | (-0.38) | (-1.87) | (-1.79) |
| 2 | 1.16 | 0.49 | 0.67 | 0.13 | 0.12 | -0.35 |
| | (4.68) | (32.18) | (2.72) | (0.67) | (6.14) | (-1.88) |
| 3 | 1.18 | 0.61 | 0.57 | 0.18 | 0.25 | -0.43 |
| | (4.66) | (36.98) | (2.26) | (0.97) | (12.96) | (-2.39) |
| 4 | 0.87 | 0.70 | 0.18 | -0.06 | 0.34 | -0.75 |
| | (3.33) | (32.34) | (0.67) | (-0.30) | (14.06) | (-4.01) |
| High | 0.42 | 0.87 | -0.44 | -0.69 | 0.49 | -1.52 |
| | (1.37) | (22.02) | (-1.42) | (-2.98) | (11.26) | (-6.49) |
| High-Low | -0.54 | 0.56 | -1.09 | -0.60 | 0.53 | -1.13 |
| | (-2.08) | (13.28) | (-4.14) | (-2.26) | (12.22) | (-4.16) |
| | | | Panel B. Portfolio Sorted by Dividend/Total Asset | | | |
| Low | 1.12 | 0.41 | 0.72 | 0.04 | 0.03 | -0.35 |
| | (3.80) | (16.18) | (2.41) | (0.19) | (0.85) | (-1.57) |
| 2 | 1.03 | 0.56 | 0.47 | -0.11 | 0.18 | -0.67 |
| | (3.53) | (26.21) | (1.61) | (-0.52) | (6.73) | (-3.03) |
| 3 | 1.13 | 0.56 | 0.57 | 0.04 | 0.18 | -0.51 |
| | (4.53) | (33.01) | (2.30) | (0.20) | (8.59) | (-2.86) |
| 4 | 0.96 | 0.60 | 0.37 | -0.05 | 0.20 | -0.62 |
| | (3.75) | (32.63) | (1.44) | (-0.25) | (9.73) | (-3.28) |
| High | 0.99 | 0.60 | 0.39 | 0.06 | 0.22 | -0.54 |
| | (4.52) | (34.99) | (1.77) | (0.33) | (10.28) | (-3.20) |
| High-Low | -0.13 | 0.19 | -0.33 | 0.01 | 0.19 | -0.18 |
| | (-0.57) | (7.58) | (-1.39) | (0.05) | (7.20) | (-0.76) |
| | | | Panel C. Portfolio Sorted by Dividend Payout Ratio | | | |
| Low | 1.28 | 0.37 | 0.91 | 0.17 | -0.01 | -0.19 |
| | (4.44) | (18.17) | (3.15) | (0.84) | (-0.55) | (-0.89) |
| 2 | 1.22 | 0.51 | 0.70 | 0.10 | 0.13 | -0.41 |
| | (4.63) | (30.02) | (2.69) | (0.51) | (6.17) | (-2.16) |
| 3 | 1.08 | 0.56 | 0.52 | 0.07 | 0.18 | -0.48 |
| | (4.31) | (31.82) | (2.08) | (0.37) | (8.27) | (-2.64) |
| 4 | 0.95 | 0.63 | 0.31 | -0.04 | 0.25 | -0.66 |
| | (4.06) | (33.99) | (1.35) | (-0.21) | (10.81) | (-3.63) |
| High | 0.71 | 0.72 | -0.01 | -0.28 | 0.33 | -0.97 |
| | (2.91) | (29.41) | (-0.04) | (-1.47) | (11.40) | (-5.17) |
| High-Low | -0.57 | 0.35 | -0.92 | -0.45 | 0.34 | -0.79 |
| | (-2.80) | (12.54) | (-4.46) | (-2.18) | (11.73) | (-3.79) |

**Table 4. Dividend Yield Decomposition and Performance of Decomposed Dividend-sorted Portfolio**

This table presents the return components of each decomposed dividend yield sorted portfolio of REIT stocks. At the beginning of each month, we sort all REITs and stocks based on dividend yield components and divide them into quintile portfolios. Then, we calculate the average monthly value-weighted holding period returns of each quintile portfolios. We calculate abnormal returns using the Fama-French four-factor model. We define dividend yields by dividing the dividends per share by share price. The full-capacity dividend component reflects dividends fully distributed from operation funds from operation. The excess-capacity dividend component is the dividend paid in excess of the full-capacity dividend. Both the full-capacity dividend yield and excess-capacity dividend yield are calculated using each dividend component and the share price at the fiscal year-end.

| | Raw Return | | | Fama-French 4-factor Alpha | | |
|---|---|---|---|---|---|---|
| Quintile | Total Return | Dividend Income | Capital Gain | Total Return | Dividend Income | Capital Gain |
| | | | Panel A. Full-capacity Dividend Yield | | | |
| Low | 0.79 | 0.51 | 0.28 | -0.21 | 0.15 | -0.71 |
| | (3.10) | (21.90) | (1.11) | (-1.06) | (5.38) | (-3.55) |
| 2 | 1.01 | 0.51 | 0.50 | -0.04 | 0.15 | -0.54 |
| | (3.89) | (38.71) | (1.93) | (-0.21) | (8.76) | (-2.85) |
| 3 | 1.12 | 0.57 | 0.55 | 0.15 | 0.20 | -0.41 |
| | (4.47) | (33.14) | (2.19) | (0.83) | (10.64) | (-2.24) |
| 4 | 0.95 | 0.62 | 0.32 | -0.07 | 0.25 | -0.68 |
| | (3.82) | (30.73) | (1.31) | (-0.41) | (10.98) | (-3.90) |
| High | 1.13 | 0.68 | 0.46 | 0.08 | 0.31 | -0.58 |
| | (3.75) | (24.25) | (1.50) | (0.39) | (9.68) | (-2.64) |
| High-Low | 0.35 | 0.17 | 0.17 | 0.30 | 0.16 | 0.13 |
| | (1.51) | (5.13) | (0.75) | (1.28) | (4.69) | (0.56) |
| | | | Panel B. Excess-capacity Dividend Yield | | | |
| Low | 1.31 | 0.54 | 0.77 | 0.18 | 0.17 | -0.35 |
| | (4.54) | (22.56) | (2.67) | (0.92) | (6.39) | (-1.73) |
| 2 | 1.09 | 0.49 | 0.60 | 0.05 | 0.13 | -0.43 |
| | (4.24) | (29.70) | (2.34) | (0.25) | (6.12) | (-2.43) |
| 3 | 1.02 | 0.54 | 0.48 | 0.02 | 0.17 | -0.50 |
| | (3.99) | (32.40) | (1.89) | (0.13) | (9.16) | (-2.63) |
| 4 | 0.96 | 0.60 | 0.36 | -0.02 | 0.23 | -0.60 |
| | (4.06) | (33.16) | (1.51) | (-0.09) | (11.04) | (-3.30) |
| High | 0.45 | 0.72 | -0.27 | -0.56 | 0.36 | -1.27 |
| | (1.76) | (24.78) | (-1.05) | (-2.88) | (10.63) | (-6.43) |
| High-Low | -0.86 | 0.18 | -1.04 | -0.74 | 0.18 | -0.92 |
| | (-4.38) | (5.62) | (-5.22) | (-3.71) | (5.39) | (-4.54) |

**Table 5. Fama-French Four Factor Model Regression of Decomposed Dividend-sorted Portfolio**
This table presents the alpha and factor loadings of Fama-French four factor model of decomposed dividend component-sorted portfolios of REIT stocks. At the beginning of each month, we sort all REITs and stocks based on dividend yields and divide them into quintile portfolios. Then, we calculate the average monthly value-weighted holding period returns of each quintile portfolio. We define dividend yields by dividing the dividends per share by share price. The full-capacity dividend component reflects dividends fully distributed from operation funds from operation. The excess-capacity dividend component is the dividend paid in excess of the full-capacity dividend. Both the full-capacity dividend yield and excess-capacity dividend yield are calculated using each dividend component and the share price at the fiscal year-end.

| | Factor Loadings on Fama-French 4-factor Models | | | | | |
|---|---|---|---|---|---|---|
| Quintile | Alpha | Market | SMB | HML | UMD | Adj. R2 |
| | Panel A. Portfolio Sorted by Dividend Yield | | | | | |
| Low | -0.08 | 0.80 | 0.49 | 0.62 | -0.13 | 0.48 |
| | (-0.38) | (15.65) | (6.71) | (7.99) | (-2.62) | |
| 2 | 0.13 | 0.72 | 0.39 | 0.66 | -0.06 | 0.49 |
| | (0.67) | (16.39) | (6.33) | (9.96) | (-1.43) | |
| 3 | 0.18 | 0.70 | 0.47 | 0.78 | -0.16 | 0.53 |
| | (0.97) | (16.28) | (7.77) | (11.93) | (-3.89) | |
| 4 | -0.06 | 0.66 | 0.55 | 0.77 | -0.25 | 0.54 |
| | (-0.30) | (14.90) | (8.78) | (11.50) | (-6.07) | |
| High | -0.69 | 0.81 | 0.60 | 0.89 | -0.19 | 0.50 |
| | (-2.98) | (14.92) | (7.77) | (10.79) | (-3.72) | |
| High-Low | -0.60 | 0.01 | 0.11 | 0.27 | -0.06 | 0.02 |
| | (-2.26) | (0.16) | (1.25) | (2.82) | (-1.08) | |
| | Panel B. Portfolio Sorted by Full-capacity Dividend Yield | | | | | |
| Low | -0.21 | 0.66 | 0.48 | 0.68 | -0.07 | 0.44 |
| | (-1.06) | (13.96) | (7.15) | (9.42) | (-1.61) | |
| 2 | -0.04 | 0.75 | 0.42 | 0.71 | -0.10 | 0.51 |
| | (-0.21) | (16.86) | (6.56) | (10.39) | (-2.38) | |
| 3 | 0.15 | 0.69 | 0.44 | 0.70 | -0.17 | 0.52 |
| | (0.83) | (16.17) | (7.17) | (10.75) | (-4.16) | |
| 4 | -0.07 | 0.68 | 0.52 | 0.79 | -0.14 | 0.56 |
| | (-0.41) | (16.76) | (9.03) | (12.78) | (-3.68) | |
| High | 0.08 | 0.77 | 0.65 | 0.88 | -0.25 | 0.53 |
| | (0.39) | (15.16) | (8.97) | (11.31) | (-5.24) | |
| High-Low | 0.30 | 0.11 | 0.17 | 0.20 | -0.18 | 0.06 |
| | (1.28) | (2.11) | (2.21) | (2.43) | (-3.50) | |
| | Panel C. Portfolio Sorted by Excess-capacity Dividend Yield | | | | | |
| Low | 0.18 | 0.81 | 0.65 | 0.90 | -0.16 | 0.57 |
| | (0.92) | (17.38) | (9.75) | (12.64) | (-3.71) | |
| 2 | 0.05 | 0.77 | 0.42 | 0.71 | -0.13 | 0.55 |
| | (0.25) | (18.25) | (6.90) | (11.07) | (-3.28) | |
| 3 | 0.02 | 0.69 | 0.50 | 0.70 | -0.13 | 0.49 |
| | (0.13) | (15.21) | (7.79) | (10.21) | (-2.93) | |
| 4 | -0.02 | 0.65 | 0.36 | 0.64 | -0.07 | 0.46 |
| | (-0.09) | (15.16) | (5.99) | (9.79) | (-1.78) | |
| High | -0.56 | 0.71 | 0.41 | 0.68 | -0.10 | 0.47 |
| | (-2.88) | (15.44) | (6.35) | (9.76) | (-2.33) | |
| High-Low | -0.74 | -0.10 | -0.23 | -0.22 | 0.06 | 0.05 |
| | (-3.71) | (-2.17) | (-3.46) | (-3.00) | (1.40) | |

**Table 6. Characteristics of Decomposed Dividend-sorted Portfolios**

This table presents the characteristics of dividend component-sorted portfolios of REIT stocks. At the beginning of each month, we sort all REITs and stocks based on dividend yields and divide them into quintile portfolios. Then, we calculate the average monthly value-weighted characteristics of each quintile portfolio. Dividend yield, full-capacity dividend yield, and excess-capacity dividend yield are calculated using each dividend component and the share price at the fiscal year-end. We defined the change in dividends as the difference between the dividends paid in the four quarters of one fiscal year and the dividends paid in the four quarters of the previous fiscal year. This dollar change in dividends is scaled by the total asset at the end of the first fiscal year to obtain the change in the dividend yield. EPS is defined as dividing the earnings by shares outstanding. Total return (ret), dividend income (ret-retx), capital gain (retx) are obtained from CRSP.

| | Formation Period Information | | | | | | |
|---|---|---|---|---|---|---|---|
| Quintile | Dividend Yield | Div/Asset | Δ(Div/Asset) | EPS | Past One-year Total Return | Past One-year Dividend Income | Past One-year Capital Gain |
| | Panel A. Portfolio Sorted by Dividend Yield | | | | | | |
| Low | 0.02 | 2.21 | -0.97 | 0.97 | 0.20 | 0.04 | 0.16 |
| | (32.51) | (26.00) | (-7.70) | (25.47) | (15.82) | (27.00) | (12.75) |
| 2 | 0.05 | 4.94 | 0.02 | 1.58 | 0.18 | 0.06 | 0.11 |
| | (75.96) | (54.30) | (0.74) | (68.62) | (19.78) | (77.24) | (12.92) |
| 3 | 0.07 | 5.11 | 0.12 | 1.43 | 0.18 | 0.08 | 0.09 |
| | (72.84) | (76.26) | (2.51) | (69.75) | (15.67) | (74.20) | (8.73) |
| 4 | 0.09 | 5.51 | 0.21 | 1.41 | 0.17 | 0.09 | 0.07 |
| | (64.60) | (63.86) | (4.06) | (34.79) | (14.15) | (69.53) | (6.07) |
| High | 0.18 | 7.19 | 1.48 | 1.48 | 0.15 | 0.13 | 0.02 |
| | (31.73) | (27.86) | (11.78) | (16.62) | (8.64) | (52.08) | (1.49) |
| High-Low | 0.16 | 4.97 | 2.44 | 0.51 | -0.05 | 0.09 | -0.14 |
| | (27.90) | (17.64) | (14.33) | (5.02) | (-2.95) | (31.55) | (-9.18) |
| | Panel B. Portfolio Sorted by Full-capacity Dividend Yield | | | | | | |
| Low | 0.04 | 7.17 | -0.39 | 0.14 | 0.15 | 0.06 | 0.08 |
| | (40.59) | (18.47) | (-4.73) | (2.44) | (13.69) | (46.04) | (7.62) |
| 2 | 0.05 | 5.64 | -0.00 | 1.48 | 0.17 | 0.06 | 0.10 |
| | (49.71) | (65.95) | (-0.03) | (60.30) | (17.74) | (72.60) | (10.93) |
| 3 | 0.05 | 6.77 | 0.22 | 1.61 | 0.18 | 0.07 | 0.10 |
| | (45.70) | (54.96) | (6.04) | (62.91) | (18.16) | (61.39) | (10.36) |
| 4 | 0.05 | 8.43 | 0.04 | 1.71 | 0.17 | 0.09 | 0.08 |
| | (26.93) | (45.13) | (0.49) | (62.34) | (15.44) | (49.28) | (7.72) |
| High | 0.05 | 11.73 | 0.99 | 2.19 | 0.22 | 0.09 | 0.12 |
| | (24.64) | (30.56) | (9.23) | (35.74) | (12.68) | (46.49) | (7.35) |
| High-Low | 0.01 | 4.56 | 1.38 | 2.05 | 0.08 | 0.03 | 0.04 |
| | (2.58) | (9.32) | (11.18) | (28.51) | (5.28) | (11.81) | (3.02) |
| | Panel C. Portfolio Sorted by Excess-capacity Dividend Yield | | | | | | |
| Low | 0.07 | 2.89 | -0.23 | 1.86 | 0.25 | 0.07 | 0.17 |
| | (40.86) | (46.75) | (-4.63) | (45.98) | (14.76) | (46.15) | (10.70) |
| 2 | 0.06 | 4.14 | 0.02 | 1.58 | 0.19 | 0.06 | 0.12 |
| | (65.76) | (49.32) | (0.24) | (65.12) | (19.49) | (70.30) | (13.02) |
| 3 | 0.06 | 5.33 | 0.09 | 1.49 | 0.16 | 0.07 | 0.09 |
| | (68.19) | (56.95) | (2.32) | (63.08) | (17.93) | (68.01) | (10.11) |
| 4 | 0.07 | 5.73 | 0.13 | 1.50 | 0.15 | 0.08 | 0.07 |
| | (75.12) | (73.32) | (3.42) | (45.10) | (15.54) | (79.83) | (7.74) |
| High | 0.13 | 6.98 | 0.84 | 0.60 | 0.12 | 0.10 | 0.02 |
| | (30.61) | (27.64) | (6.16) | (8.18) | (11.76) | (43.38) | (2.21) |
| High-Low | 0.06 | 4.08 | 1.07 | -1.26 | -0.12 | 0.03 | -0.14 |
| | (15.69) | (16.01) | (7.29) | (-15.51) | (-10.43) | (12.27) | (-13.17) |

**Table 7. Stock-level Cross-sectional Regressions**

This table presents the result of multivariate regression of the relation between dividend components and future REIT performance using a multivariate regression approach. Specifically, we perform multivariate analysis based on annual data by estimating the following predictive regressions:

$$r_{i,t+1} = \alpha_i + \beta_1 Div\ Yield_{i,t} + \beta_2 Beta_{i,t} + \beta_3 Size_{i,t} + \beta_4 Mom_{i,t} + \beta_5 Rev_{i,t} + \beta_6 Term_{i,t} + \beta_7 Def_{i,t} + \varepsilon_{i,t+1}$$

where dependent variable $r_{i,t+1}$ is the return on REIT $i$ in year $t$+1, and $Div\ Yield$ represents the main variable to test various dividend yields including total, full-capacity, and excess-capacity dividend yields. Additionally, we choose the common factors that explain the REIT return as a control variable. The control variables are included: $Beta_t$ is beta for REIT market in year t, $Size$ is market capitalization, $Mom_{i,t}$ is momentum factor defined as cumulative return for the past 12 months skipping the most recent month, $Rev_{i,t}$ is a reversal factor defined as the past one-month return, $Term$ is the term spread defined as the difference between the long-term yield on government bonds and the Treasury bill, $Def$ is the default spread defined as the spread between BAA and AAA-rated corporate bonds, and $\varepsilon_{i,t}$ captures the deviation of the realized return from its expected value. We estimate all of our panel regressions with two-way clustered standard errors by firm and year.

| Explanatory Variable | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Intercept | 13.45 | 11.34 | 12.52 | 11.74 | 2.44 | 0.94 | 1.92 | 1.80 |
| | (4.09) | (3.41) | (3.81) | (3.57) | (0.34) | (0.13) | (0.27) | (0.25) |
| Dividend Yield | -4.34 | | | | -8.97 | | | |
| | (-1.38) | | | | (-2.94) | | | |
| Full-capacity Dividend Yield | | 12.81 | | 6.77 | | 9.49 | | 1.20 |
| | | (3.07) | | (1.14) | | (2.41) | | (0.23) |
| Excess-capacity Dividend Yield | | | -11.40 | -7.91 | | | -11.22 | -10.70 |
| | | | (-3.75) | (-2.23) | | | (-4.05) | (-3.03) |
| Beta | | | | | -3.85 | -3.47 | -3.73 | -3.71 |
| | | | | | (-2.30) | (-2.02) | (-2.24) | (-2.22) |
| Size | | | | | -0.83 | -0.57 | -0.83 | -0.83 |
| | | | | | (-1.69) | (-1.36) | (-1.69) | (-1.68) |
| Book-to-market | | | | | 1.20 | 0.46 | 0.69 | 0.64 |
| | | | | | (1.71) | (0.53) | (0.91) | (0.87) |
| Momentum | | | | | 7.93 | 7.96 | 7.96 | 7.98 |
| | | | | | (1.30) | (1.21) | (1.24) | (1.25) |
| Reversal | | | | | 30.78 | 31.93 | 30.57 | 30.59 |
| | | | | | (1.44) | (1.45) | (1.42) | (1.43) |
| Term Spread | | | | | 4.59 | 4.66 | 4.63 | 4.63 |
| | | | | | (2.71) | (2.71) | (2.74) | (2.74) |
| Default Spread | | | | | 5.19 | 5.23 | 5.04 | 5.03 |
| | | | | | (1.63) | (1.62) | (1.58) | (1.58) |
| Adjusted R-squared | 0.20 | 0.99 | 1.37 | 1.52 | 8.96 | 8.92 | 9.59 | 9.59 |

**Table 8. Performance of Momentum Strategies with Return Adjustment**

This table presents the performance of the momentum strategies with return adjustment by choosing formation period return as total return, ex-dividend return, and excess yield-adjusted return. Specifically, we select from the monthly winner and loser portfolio based on the past six-month returns for three alternative specifications. Next, we form monthly zero-cost long-short momentum portfolios from one to 12 months. We skip one month between formation and holding periods to avoid bid-ask bounce and microstructural effects.

| | Months after Construction of Momentum Portfolio | | | | |
|---|---|---|---|---|---|
| Quintile | t+1 | t+3 | t+6 | t+9 | t+12 |
| Panel A: Performance of Total Return Momentum | | | | | |
| Loser | 0.59 | 0.73 | 0.65 | 0.56 | 0.61 |
| | (1.39) | (1.61) | (1.70) | (1.57) | (1.77) |
| 2 | 0.85 | 0.87 | 0.89 | 0.91 | 0.89 |
| | (2.81) | (2.94) | (3.00) | (2.98) | (3.00) |
| 3 | 1.04 | 1.13 | 1.11 | 1.11 | 1.10 |
| | (4.16) | (4.45) | (4.11) | (4.08) | (4.10) |
| 4 | 1.17 | 1.14 | 1.19 | 1.19 | 1.17 |
| | (4.82) | (4.79) | (4.99) | (4.94) | (4.78) |
| Winner | 1.13 | 1.19 | 1.24 | 1.26 | 1.22 |
| | (4.61) | (4.99) | (5.18) | (5.24) | (4.99) |
| WML Return | 0.53 | 0.47 | 0.59 | 0.70 | 0.61 |
| | (1.57) | (1.29) | (2.10) | (2.96) | (2.89) |
| WML FF4α | 0.50 | 0.30 | 0.41 | 0.58 | 0.54 |
| | (1.63) | (0.90) | (1.63) | (2.75) | (2.87) |
| Panel B: Performance of Ex-dividend Return Momentum | | | | | |
| Loser | 0.66 | 0.72 | 0.62 | 0.53 | 0.57 |
| | (1.55) | (1.58) | (1.63) | (1.48) | (1.64) |
| 2 | 0.81 | 0.84 | 0.86 | 0.88 | 0.88 |
| | (2.72) | (2.86) | (2.93) | (2.92) | (2.98) |
| 3 | 1.11 | 1.14 | 1.11 | 1.11 | 1.10 |
| | (4.38) | (4.47) | (4.05) | (3.93) | (3.96) |
| 4 | 1.07 | 1.16 | 1.21 | 1.20 | 1.20 |
| | (4.37) | (4.85) | (5.03) | (4.96) | (4.86) |
| Winner | 1.21 | 1.18 | 1.23 | 1.27 | 1.24 |
| | (4.86) | (4.89) | (5.12) | (5.26) | (5.02) |
| WML Return | 0.54 | 0.46 | 0.61 | 0.75 | 0.67 |
| | (1.60) | (1.25) | (2.20) | (3.13) | (3.15) |
| WML FF4α | 0.50 | 0.27 | 0.43 | 0.62 | 0.60 |
| | (1.62) | (0.79) | (1.68) | (2.87) | (3.08) |
| Panel C: Performance of Excess Yield-adjusted Return Momentum | | | | | |
| Loser | 0.51 | 0.65 | 0.57 | 0.50 | 0.55 |
| | (1.19) | (1.45) | (1.53) | (1.42) | (1.60) |
| 2 | 0.85 | 0.91 | 0.92 | 0.90 | 0.89 |
| | (2.90) | (3.10) | (3.09) | (2.95) | (2.97) |
| 3 | 1.07 | 1.13 | 1.06 | 1.10 | 1.08 |
| | (4.24) | (4.44) | (3.93) | (3.91) | (3.96) |
| 4 | 1.01 | 1.09 | 1.18 | 1.19 | 1.17 |
| | (4.15) | (4.60) | (4.91) | (4.90) | (4.73) |
| Winner | 1.31 | 1.29 | 1.31 | 1.32 | 1.30 |
| | (5.27) | (5.29) | (5.43) | (5.46) | (5.25) |
| WML Return | 0.80 | 0.64 | 0.73 | 0.82 | 0.75 |
| | (2.31) | (1.74) | (2.65) | (3.48) | (3.49) |
| WML FF4α | 0.75 | 0.46 | 0.54 | 0.66 | 0.65 |
| | (2.35) | (1.33) | (2.11) | (3.08) | (3.29) |

# Appendix: Dividend Decomposition based on Statutory Requirements

**Table A1. Alternative Dividend Yield Decomposition and Performance of Decomposed Dividend-sorted Portfolio**

This table presents the return components of each decomposed dividend yield sorted portfolio of REIT stocks. At the beginning of each month, we sort all REITs and stocks based on dividend yield components and divide them into quintile portfolios. Then, we calculate the average monthly value-weighted holding period returns of each quintile portfolios. We calculate abnormal returns using the Fama-French four-factor model. We define dividend yields by dividing the dividends per share by share price. The mandatory dividend component reflects dividends distributed to meet statutory requirements. The discretionary dividend component is the dividend paid in excess of the statutory requirements. According to Hardin and Hill (2008), the statutory requirements are set at 90% of pretax income. Both the mandatory dividend yield and discretionary dividend yield are calculated using each dividend component and the share price at the fiscal year-end.

| | Raw Return | | | Fama-French 4-factor Alpha | | |
|---|---|---|---|---|---|---|
| Quintile | Total Return | Dividend Income | Capital Gain | Total Return | Dividend Income | Capital Gain |
| | | | Panel A. Mandatory Dividend Yield | | | |
| Low | 0.64 | 0.48 | 0.16 | -0.56 | 0.13 | -1.04 |
| | (2.03) | (21.39) | (0.50) | (-2.53) | (4.85) | (-4.67) |
| 2 | 1.16 | 0.50 | 0.66 | 0.10 | 0.14 | -0.40 |
| | (4.52) | (34.69) | (2.56) | (0.51) | (8.05) | (-2.13) |
| 3 | 1.11 | 0.54 | 0.57 | 0.13 | 0.18 | -0.40 |
| | (4.46) | (35.31) | (2.29) | (0.71) | (9.68) | (-2.16) |
| 4 | 0.95 | 0.62 | 0.34 | -0.02 | 0.25 | -0.62 |
| | (3.80) | (32.35) | (1.33) | (-0.10) | (12.11) | (-3.30) |
| High | 0.91 | 0.75 | 0.16 | -0.16 | 0.37 | -0.89 |
| | (3.28) | (23.38) | (0.58) | (-0.83) | (10.12) | (-4.40) |
| High-Low | 0.26 | 0.27 | -0.01 | 0.39 | 0.24 | 0.15 |
| | (1.23) | (7.49) | (-0.06) | (1.82) | (6.42) | (0.69) |
| | | | Panel B. Discretionary Dividend Yield | | | |
| Low | 1.05 | 0.48 | 0.57 | 0.02 | 0.12 | -0.45 |
| | (3.85) | (24.11) | (2.10) | (0.09) | (4.77) | (-2.30) |
| 2 | 1.10 | 0.51 | 0.59 | 0.09 | 0.14 | -0.40 |
| | (4.49) | (30.94) | (2.43) | (0.49) | (7.18) | (-2.28) |
| 3 | 1.13 | 0.58 | 0.55 | 0.12 | 0.21 | -0.45 |
| | (4.81) | (35.06) | (2.36) | (0.69) | (10.66) | (-2.62) |
| 4 | 0.84 | 0.61 | 0.23 | -0.20 | 0.25 | -0.80 |
| | (3.13) | (35.80) | (0.85) | (-1.00) | (12.20) | (-4.05) |
| High | 0.66 | 0.70 | -0.04 | -0.43 | 0.34 | -1.11 |
| | (2.15) | (22.89) | (-0.13) | (-2.02) | (9.70) | (-5.17) |
| High-Low | -0.40 | 0.22 | -0.61 | -0.44 | 0.22 | -0.66 |
| | (-2.16) | (6.80) | (-3.27) | (-2.37) | (6.64) | (-3.47) |

**Table A2. Fama-French Four-Factor Model Regression of Alternatively Decomposed Dividend-sorted Portfolio**

This table presents the alpha and factor loadings of Fama-French four factor model of decomposed dividend component-sorted portfolios of REIT stocks based on alternative decomposition using pretax income. At the beginning of each month, we sort all REITs and stocks based on dividend yields and divide them into quintile portfolios. Then, we calculate the average monthly value-weighted holding period returns of each quintile portfolio. We define dividend yields by dividing the dividends per share by share price. The mandatory dividend component reflects dividends distributed to meet statutory requirements. The discretionary dividend component is the dividend paid in excess of the statutory requirements. According to Hardin and Hill (2008), the statutory requirements are set at 90% of pretax income. Both the mandatory dividend yield and discretionary dividend yield are calculated using each dividend component and the share price at the fiscal year-end.

| | Fama-French 4-factor Model | | | | | |
|---|---|---|---|---|---|---|
| Quintile | Alpha | Market | SMB | HML | UMD | Adj. R2 |
| | | | Panel A. Mandatory Dividend Yield | | | |
| Low | -0.56 | 0.88 | 0.63 | 0.97 | -0.16 | 0.55 |
| | (-2.53) | (17.04) | (8.60) | (12.29) | (-3.18) | |
| 2 | 0.10 | 0.74 | 0.45 | 0.70 | -0.08 | 0.51 |
| | (0.51) | (16.58) | (7.03) | (10.35) | (-1.92) | |
| 3 | 0.13 | 0.70 | 0.40 | 0.66 | -0.14 | 0.50 |
| | (0.71) | (16.09) | (6.46) | (9.96) | (-3.37) | |
| 4 | -0.02 | 0.68 | 0.39 | 0.69 | -0.17 | 0.49 |
| | (-0.10) | (15.50) | (6.27) | (10.22) | (-3.96) | |
| High | -0.16 | 0.72 | 0.60 | 0.90 | -0.18 | 0.54 |
| | (-0.83) | (15.55) | (9.02) | (12.68) | (-3.99) | |
| High-Low | 0.39 | -0.15 | -0.03 | -0.07 | -0.02 | 0.02 |
| | (1.82) | (-3.05) | (-0.47) | (-0.86) | (-0.43) | |
| | | | Panel B. Discretionary Dividend Yield | | | |
| Low | 0.02 | 0.76 | 0.52 | 0.74 | -0.17 | 0.53 |
| | (0.09) | (16.49) | (7.92) | (10.47) | (-3.82) | |
| 2 | 0.09 | 0.72 | 0.41 | 0.65 | -0.10 | 0.52 |
| | (0.49) | (17.24) | (6.81) | (10.24) | (-2.45) | |
| 3 | 0.12 | 0.69 | 0.39 | 0.67 | -0.07 | 0.52 |
| | (0.69) | (17.15) | (6.84) | (11.00) | (-1.89) | |
| 4 | -0.20 | 0.74 | 0.47 | 0.77 | -0.15 | 0.51 |
| | (-1.00) | (15.85) | (7.10) | (10.92) | (-3.37) | |
| High | -0.43 | 0.80 | 0.73 | 0.91 | -0.25 | 0.57 |
| | (-2.02) | (16.05) | (10.25) | (11.98) | (-5.35) | |
| High-Low | -0.44 | 0.04 | 0.21 | 0.17 | -0.09 | 0.04 |
| | (-2.37) | (0.83) | (3.28) | (2.55) | (-2.04) | |

**Table A3. Characteristics of Alternatively Decomposed Dividend-sorted Portfolios**

This table presents the characteristics of dividend component-sorted portfolios of REIT stocks. At the beginning of each month, we sort all REITs and stocks based on dividend yields and divide them into quintile portfolios. Then, we calculate the average monthly value-weighted characteristics of each quintile portfolio. Dividend yield, mandatory dividend yield, and discretionary dividend yield are calculated using each dividend component and the share price at the fiscal year-end. We defined the change in dividends as the difference between the dividends paid in the four quarters of one fiscal year and the dividends paid in the four quarters of the previous fiscal year. This dollar change in dividends is scaled by the total asset at the end of the first fiscal year to obtain the change in the dividend yield. EPS is defined as dividing the earnings by shares outstanding. Total return (ret), dividend income (ret-retx), capital gain (retx) are obtained from CRSP.

| | Formation Period Information | | | | | | |
|---|---|---|---|---|---|---|---|
| Quintile | Dividend Yield | Div/AT | Δ(Div/AT) | EPS | Past One-year Total Return | Past One-year Dividend Income | Past One-year Capital Gain |
| | Panel A. Mandatory Dividend Yield | | | | | | |
| Low | 0.08 | 3.09 | -0.62 | -0.47 | 0.16 | 0.06 | 0.09 |
| | (15.11) | (33.53) | (-4.93) | (-10.48) | (11.94) | (38.12) | (7.29) |
| 2 | 0.06 | 4.30 | -0.02 | 1.03 | 0.18 | 0.06 | 0.11 |
| | (59.55) | (44.79) | (-0.29) | (35.17) | (16.64) | (73.17) | (10.50) |
| 3 | 0.06 | 5.11 | 0.13 | 1.66 | 0.16 | 0.07 | 0.09 |
| | (60.73) | (52.31) | (3.82) | (68.66) | (17.81) | (73.20) | (10.23) |
| 4 | 0.08 | 5.64 | 0.43 | 1.97 | 0.17 | 0.08 | 0.08 |
| | (47.08) | (34.96) | (6.76) | (61.89) | (17.11) | (51.79) | (8.72) |
| High | 0.12 | 5.59 | 0.97 | 2.75 | 0.21 | 0.10 | 0.10 |
| | (31.87) | (26.10) | (8.29) | (40.12) | (12.92) | (46.67) | (6.59) |
| High-Low | 0.05 | 2.43 | 1.60 | 3.23 | 0.05 | 0.04 | 0.01 |
| | (7.71) | (12.35) | (9.66) | (40.35) | (4.41) | (15.41) | (0.50) |
| | Panel B. Discretionary Dividend Yield | | | | | | |
| Low | 0.05 | 3.38 | -0.18 | 2.23 | 0.22 | 0.06 | 0.15 |
| | (55.39) | (59.54) | (-3.84) | (43.23) | (17.01) | (51.85) | (12.72) |
| 2 | 0.06 | 4.91 | -0.17 | 1.53 | 0.19 | 0.06 | 0.12 |
| | (63.83) | (44.70) | (-3.61) | (48.70) | (19.06) | (65.70) | (12.78) |
| 3 | 0.07 | 5.31 | 0.23 | 1.47 | 0.18 | 0.07 | 0.10 |
| | (75.05) | (59.49) | (5.06) | (76.90) | (18.34) | (76.44) | (10.61) |
| 4 | 0.08 | 4.89 | 0.06 | 1.09 | 0.15 | 0.08 | 0.06 |
| | (62.25) | (54.24) | (0.69) | (37.76) | (14.90) | (70.25) | (6.54) |
| High | 0.15 | 6.82 | 1.04 | 0.28 | 0.13 | 0.10 | 0.03 |
| | (27.11) | (25.97) | (7.93) | (3.41) | (9.29) | (40.57) | (2.19) |
| High-Low | 0.10 | 3.44 | 1.22 | -1.94 | -0.09 | 0.04 | -0.12 |
| | (18.74) | (12.79) | (8.72) | (-18.71) | (-8.85) | (15.09) | (-12.83) |

**Table A4. Stock-level Cross-sectional Regressions with Alternatively Decomposed Dividend Yields**

This table presents the result of multivariate regression of the relation between dividend components and future REIT performance using a multivariate regression approach. Specifically, we perform multivariate analysis based on annual data by estimating the following predictive regressions:

$$r_{i,t+1} = \alpha_i + \beta_1 Div\ Yield_{i,t} + \beta_2 Beta_{i,t} + \beta_3 Size_{i,t} + \beta_4 Mom_{i,t} + \beta_5 Rev_{i,t} + \beta_6 Term_{i,t} + \beta_7 Def_{i,t} + \varepsilon_{i,t+1}$$

where dependent variable $r_{i,t+1}$ is the return on REIT $i$ in year $t$+1, and $Div\ Yield$ represents the main variable to test various dividend yields including total, mandatory, and discretionary dividend yields. Additionally, we choose the common factors that explain the REIT return as a control variable. The control variables are included: $Beta_t$ is beta for REIT market in year t, $Size$ is market capitalization, $Mom_{i,t}$ is momentum factor defined as cumulative return for the past 12 months skipping the most recent month, $Rev_{i,t}$ is a reversal factor defined as the past one-month return, $Term$ is the term spread defined as the difference between the long-term yield on government bonds and the Treasury bill, $Def$ is the default spread defined as the spread between BAA and AAA-rated corporate bonds, and $\varepsilon_{i,t}$ captures the deviation of the realized return from its expected value. We estimate all of our panel regressions with two-way clustered standard errors by firm and year.

| Parameter | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Intercept | 12.47 | 13.22 | 12.78 | 1.57 | 2.28 | 2.23 |
| | (3.68) | (4.01) | (3.84) | (0.22) | (0.32) | (0.32) |
| Mandatory Dividend Yield | 9.39 | | 5.91 | 5.58 | | 0.69 |
| | (1.80) | | (1.06) | (0.94) | | (0.12) |
| Discretionary Dividend Yield | | -7.14 | -6.01 | | -10.14 | -10.05 |
| | | (-2.18) | (-1.82) | | (-3.05) | (-3.00) |
| Beta | | | | -3.59 | -3.79 | -3.78 |
| | | | | (-2.11) | (-2.26) | (-2.27) |
| Size | | | | -0.58 | -0.83 | -0.83 |
| | | | | (-1.38) | (-1.69) | (-1.69) |
| Book-to-Market | | | | 0.86 | 1.08 | 1.07 |
| | | | | (1.04) | (1.49) | (1.52) |
| Momentum | | | | 8.04 | 8.11 | 8.11 |
| | | | | (1.22) | (1.26) | (1.26) |
| Reversal | | | | 32.00 | 30.59 | 30.58 |
| | | | | (1.45) | (1.42) | (1.42) |
| Term Spread | | | | 4.67 | 4.64 | 4.65 |
| | | | | (2.71) | (2.74) | (2.74) |
| Default Spread | | | | 5.33 | 5.13 | 5.13 |
| | | | | (1.65) | (1.61) | (1.61) |
| Adjusted R-squared | 0.18 | 0.44 | 0.53 | 8.53 | 9.11 | 9.11 |

**Table A5. Performance of Momentum Strategies with Alternative Return Adjustment**

This table presents the performance of the momentum strategies with return adjustment by choosing formation period return as total return, ex-dividend return, and discretionary dividend yield-adjusted return. Specifically, we select from the monthly winner and loser portfolio based on the past six-month returns for three alternative specifications. Next, we form monthly zero-cost long-short momentum portfolios from one to 12 months. We skip one month between formation and holding periods to avoid bid-ask bounce and microstructural effects.

| | Months after Momentum Construction | | | | |
|---|---|---|---|---|---|
| | t+1 | t+3 | t+6 | t+9 | t+12 |
| | Performance of Discretionary Dividend Yield-adjusted Return Momentum | | | | |
| Loser | 0.57 | 0.67 | 0.57 | 0.49 | 0.54 |
| | (1.30) | (1.44) | (1.48) | (1.37) | (1.53) |
| 2 | 0.85 | 0.90 | 0.90 | 0.91 | 0.90 |
| | (2.88) | (3.06) | (3.03) | (2.95) | (2.97) |
| 3 | 1.05 | 1.07 | 1.06 | 1.07 | 1.05 |
| | (4.15) | (4.16) | (3.83) | (3.78) | (3.81) |
| 4 | 0.98 | 1.11 | 1.16 | 1.18 | 1.17 |
| | (4.08) | (4.68) | (4.85) | (4.88) | (4.73) |
| Winner | 1.32 | 1.26 | 1.28 | 1.30 | 1.26 |
| | (5.44) | (5.29) | (5.42) | (5.44) | (5.20) |
| WML Return | 0.75 | 0.59 | 0.71 | 0.80 | 0.72 |
| | (2.15) | (1.55) | (2.48) | (3.34) | (3.32) |
| WML FF4α | 0.73 | 0.45 | 0.55 | 0.68 | 0.65 |
| | (2.30) | (1.25) | (2.11) | (3.17) | (3.34) |