# The Dividend Month Premium

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**Abstract:** We document an asset-pricing anomaly whereby companies have positive abnormal returns in months when they are expected to issue a dividend. Abnormal returns in predicted dividend months are high relative to other companies (by 53 basis points per month), and relative to dividend-paying companies in months without a predicted dividend (by 37 basis points per month). The anomaly produces returns as large as the value premium, but with less volatility. We argue that the premium is consistent with price-pressure from dividend-seeking investors – returns are significantly positive on the announcement day, the ex-day, and the period in between, but are significantly negative in the forty days afterwards. Measures of liquidity and demand for dividends are associated with both larger price increases before the ex-day, and larger reversals afterwards.

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Behavioral finance has identified a number of asset pricing anomalies where predictable events generate abnormally large stock returns relative to their apparent risk. From an economic perspective, it is odd that large, liquid markets should seem to leave money on the table. However, there is a long literature in psychology documenting that individuals learn how to optimally respond to events through salient feedback and reinforcement. Markets should have the *best* chance of correctly pricing securities when the opportunities for learning are greatest: for events that are predictable, that are repeated frequently for each set of investors, and that provide feedback via returns over a short horizon. Predictable price responses in these events are some of the most challenging for notions of market efficiency.

In this paper we study the reaction of stock prices around periods where companies are expected to issue dividends. Dividends are a highly predictable corporate event: they typically occur every 3 months, and companies with a history of paying dividends are reluctant to omit paying them (John and Williams (1985), Bernheim (1991)). We examine whether markets correctly price the likely existence of dividends in a given month. Rather than condition on the actual payment of dividends, we forecast a 'predicted dividend' if the company paid a quarterly dividend 3, 6, 9 or 12 months ago, a semi-annual dividend 6 or 12 months ago, or an annual dividend 12 months ago. This yields tradable portfolios and does not condition on ex-post information about whether a dividend was actually paid.

We find evidence of mispricing of stocks whereby companies have significantly higher returns in months when they are expected to issue a dividend. We term this the 'dividend month premium'. A portfolio that buys all stocks expected to issue a dividend this month earns abnormal returns of 41 basis points. Other specifications produce even higher returns – a portfolio of companies that had a semi-annual dividend six months ago has a four-factor alpha of 115 basis points per month.

Companies that are predicted to issue a dividend have large abnormal returns relative to all other companies, and also relative to dividend-paying stocks in months where they are not expected to have a dividend. A portfolio that is long expected dividend payers and short all other companies ('between companies') earns abnormal returns of 53 basis points relative to a 4 factor model. Meanwhile, a portfolio that is long companies in the month of their predicted dividend and short same companies in other months ('within companies') earns abnormal returns of 37 basis points.

The dividend month premium is unlikely to be driven by risk. In particular, the 'within companies' portfolio exploits only the time-series variation in dividend-paying companies, resulting in a portfolio with virtually zero loadings on any conventional risk factors. The reason is that the portfolio is long each company with quarterly dividends for 4 months of the year and short the same companies for 8 months of the year. Hence, any fixed loadings on risk factors will tend to cancel out. This makes the patterns in returns difficult to explain by loadings on systematic risk. Any explanation relating to risk would need to rely on time-varying risk loadings, with companies being systematically riskier in months of expected dividend payment.

We hypothesize that the dividend month premium is due to price pressure from investors in the lead-up to dividend payment. Existing theories of dividends can provide some basis for this view. Theories of catering (Baker and Wurgler (2004), Li and Lie (2006)) propose that investors may have an underlying demand for dividends, such as for psychological or institutional reasons. A desire for dividends and a positive discount rate may cause investors to have a greater willingness to pay for the stock immediately before the dividend is paid than immediately afterwards. Price pressure around dividend payment may also arise under dividend clientele theories, where groups of investors desire dividend payments for reasons such as different tax treatment, a need for income streams etc.[1] There is likely to be trade between investors with different tax rates in the lead-up to the ex-dividend day, as argued by Michaely and Vila (1996) and Michaely, Vila and Wang (1996), and such trades may impact prices.

To examine whether price pressure explains our results, we examine daily characteristic-adjusted returns within the dividend month. We find that abnormal returns are present for virtually the entire period between the announcement date and the ex-dividend date. We find that there are abnormal returns on the actual declaration day (12 basis points), the predicted declaration day (3 basis points) and on the ex-day (27 basis points). In addition, there are also abnormal returns of 16 basis points in the period between the declaration and ex-dividend days. While previous research has highlighted the importance of returns on the ex-day, we find that these are less than half of the total abnormal returns during the dividend period.

The abnormal returns in the interim period between the announcement and ex-day are consistent with price pressure, but are difficult to reconcile with alternative explanations. During this time there is no news being released about the dividend, nor is there uncertainty about the dividend size. In addition, an investor who sells the share before the ex-day does not receive the dividend. Thus, holding dividend-paying shares only for the interim period results in the same tax consequences as holding any other non-dividend-paying stock for the same length of time. Trades in this period may be motivated by investors taking positions in advance of tax considerations that arise on the ex-day. However, the abnormal returns prior to the ex-day are not

[1] Dividend clienteles have been examined by Black and Scholes (1974), Elton and Gruber (1970), Allen, Bernardo and Welch (2000), Graham and Kumar (2006), Becker, Ivkovic and Weisbenner (2009), and many others.

limited to investors of a particular tax treatment. As such, it is surprising from an asset pricing perspective that there should be abnormal returns.

If the price increases before payment are a result of price pressure, then there ought to be an increase in selling after dividend payment that results in negative returns. Consistent with this, abnormal returns in the 40 days after the ex-dividend day are -73 basis points. This effect is large enough to offset the gains during the dividend month, reinforcing the conclusion that the main effect is a time-series one.

We also show that both the high returns before the ex-day and the subsequent reversals are larger among less liquid securities, where price pressure ought to have a bigger effect. Using the measure of illiquidity in Amihud (2002), we show that less liquid securities have more positive interim returns, more positive ex-day returns, and more negative returns (i.e. larger reversals) in the forty days after the ex-day. In addition, interim and ex-day returns are significantly lower when there is a greater length of time between the announcement and the ex-dividend day, and returns after the ex-day are higher (i.e. smaller reversals). This is consistent with traders having more price impact when they are forced to buy shares over a shorter period of time. Third, we show that returns are larger when dividend yields are higher, consistent with investors having more demand for the share when dividends are bigger. The fact that all these variables predict both larger price increases before the ex-day and larger reversals afterwards is strong evidence of price pressure.

While it is difficult to disentangle whether the price pressure is arising from tax-related clientele effects or from catering effects, there is some evidence that tentatively supports the latter interpretation. In particular, we find that the dividend month premium is 16 basis points higher during recessions. If the catering demand for dividends arises from psychology (as Baker and Wurgler (2004) suggest), it may be due to a perception that dividends represent a safe, guaranteed source of revenue. If so, such demand may increase with economic uncertainty, as risk aversion is higher and the availability of alternative safe assets is reduced. It is possible that dividend-capturing trading from clienteles may also be larger in recessions, but it is not immediately clear why this ought to be the case.

We also present evidence that the dividend month premium is driven by dividends specifically, rather than other events that coincide with dividend payment. The dividend month premium does not appear to be driven by the earnings announcement premium (Beaver (1968), Frazzini and Lamont (2008)), calendar months of the year, or seasonality of returns (Heston and Sadka (2008)). We show that the dividend month premium is not driven by news about the size of the dividend. By contrast, when companies omit dividend payments the effect is not present, as expected if this is driven by the dividend itself and not other events during the month.

While we are certainly not the first to examine the effects of dividends on asset prices, we contribute to the literature in part by exploring the impact of predictable dividend payment using modern, calendar-time asset-pricing methods. The results are striking. Notwithstanding its lack of loading on risk factors, the within-companies portfolio has abnormal returns as large as the value premium, but with considerably less volatility. The within-companies portfolio has an annual Sharpe Ratio of 0.194, higher than the SMB, HML and UMD portfolios, with the long-only dividend month portfolio having a Sharpe Ratio of 0.413. The difference portfolio produces positive excess returns in 71 out of 81 years, with the largest negative annual return being only -4.6%. The effects are not limited to small or illiquid stocks: dividend-paying companies tend to be larger and more visible, and the patterns in returns hold on a value-weighted as well as an equal-weighted basis[2]. Most of the abnormal returns are from the long side of the difference portfolio, rather than the short side (where costs of implementing the strategy are higher). Due to dividend payments being highly persistent, significant alphas can be obtained using dividend information lagged up to 20 years. We show that the magnitude of these returns is sufficiently large to constitute an asset pricing puzzle. Our findings contribute to the literature on asset pricing anomalies that finds abnormal returns around regular, predictable events.[3] Our paper also contributes to the literature on the pricing of dividends. We document a result not apparent from earlier papers that examined short periods during the dividend month[4] – namely, that there are abnormal returns present during the *entire* dividend period, that there are large reversals in the weeks afterwards, and that both patterns appear to share a common underlying cause of investor price pressure. We also describe how dividend returns (and reversals) are significantly higher during recessions, a somewhat surprising fact from the perspective of standard theories of dividend payment.

While there are theoretical reasons to predict that dividend-related demand for shares may increase in the lead-up to the ex-day, once price pressure becomes predictable, it is a challenge for such models to explain why other investors (who do not care about dividends) do not trade against them to eliminate the price effects. Moreover, even taking the pre-ex-day price rises as a stylized fact, why do dividend-seeking investors not purchase the share a few days earlier, and capture the abnormal returns and the dividend? Our findings raise important

[2] Many anomalies tend to be concentrated in smaller stocks, including post-earnings announcement drift (Chordia et al (2008)), momentum (Hong, Lim and Stein (2000)), and others.

[3] These include the earnings announcement premium (Beaver (1968), Frazzini and Lamont (2008)), the January effect (Keim (1983)), return seasonality (Heston and Sadka (2008)), one month reversals (Jegadeesh (1990)), momentum (Jegadeesh and Titman (1993)), and 3-5 year reversals (DeBondt and Thaler (1985)). Our results are most similar to the earnings announcement premium, in that the returns are based around the predictable corporate events that generate high returns on average (without conditioning on the content of the news).

[4] We discuss this literature in detail in section 2.

questions as to what underlying model of investor demand is causing prices to predictably increase well in advance of the ex-day, and reverse in the period afterwards.

The remainder of the paper is structured as follows. Section 2 describes the hypotheses. Section 3 discusses the data. Section 4 presents the main results of the paper, section 5 examines alternative explanations for our findings, and section 6 concludes.

## 2. Literature Review and Hypotheses

### 2.1 Market Efficiency

The null hypothesis is that under simple models of market efficiency (Fama (1970)), using past information in dividend payments should not be able to generate risk-adjusted returns. Dividend payments tend to be quite stable over time (in the sample, 88% of firms who paid a dividend 12 months ago pay a dividend in the current month). While the news component of dividend announcements ought to affect prices, any predictable aspect of dividend announcements or payments should not result in abnormal risk-adjusted returns.

### 2.2 Price Pressure

Our main alternative hypothesis is that returns are high because of predictable short term price pressure from investors in the lead-up to dividend payment. This supposes that there are some investors who have a desire to receive the dividend (for whatever reason), and such investors control enough capital that they have price impact. If investors desire to receive the dividend, they may be more willing to buy the stock (or less willing to sell the stock) immediately before the dividend is paid than immediately afterwards. If such investors have price impact, they will push up prices in the lead-up to dividend payment. In addition, the announcement of dividends would resolve investor uncertainty about whether the dividend will be paid, and thus investor demand would be likely to increase around the announcement as well.

Price pressure as a general concept does not explain why there is an underlying demand for dividends, although there are number of theoretical models that are consistent (at least in spirit) with the intuition above. The theory of catering in Baker and Wurgler (2004) proposes that investors may have an underlying demand for dividends, such as for psychological or institutional reasons, and that firms issue dividends in response to this demand. If dividends provide utility for investors and discount rates are positive, investors will have a higher preference for companies that will pay dividends sooner.

It is also possible that price pressure may arise from the trading of dividend clienteles. Michaely, Vila and Wang (1996) describe a model where investors with different tax rates have different values for the dividend, and thus engage in trade before the ex-day. The Michaely, Vila and Wang (1996) model most clearly makes predictions about volume rather than price - that is, that there will be trade before the ex-day. Nonetheless, the general principle that clienteles are likely to trade before the ex-day is a broadly applicable one. If the dividend-seeking investors (such as tax arbitrage traders) are more numerous or command more capital, they may push up prices as the ex-day approaches.

Price pressure (however it arises) makes some specific predictions about returns. First, returns should be related to liquidity, as less liquid securities are likely to experience greater price movements from a given level of excess buying. Second, price pressure is likely to increase in the lead-up to dividend payment. If investors only wish to receive the dividend, they may not want to hold the stock for longer than necessary as it would expose them to price fluctuations. As the length of time before receiving the dividend becomes shorter, these investors are more likely to purchase the stock. Third, price pressure is likely to lead to reversals after the dividend is paid, either due to tax arbitrage traders unwinding their positions or catering investors having a lower preference for the stock. Such reversals should be related to the level of price increases that occurred before, and thus be driven by the same types of variables.

### 2.3 Alternative Hypotheses

There are a number of papers that examine the relationship between dividends and stock returns, and may predict alternative reasons for high returns in months of dividend issuance.

#### 2.3.1 The Ex-Day Effect

One of the most studied aspects of dividends and stock returns is the returns on ex-dividend days. As early as Campbell and Beranek (1955), it has been found that the ex-dividend day stock price change is typically less than the full amount of the dividend. This has been argued by Elton and Gruber (1970) to be driven by dividend clienteles, and the tax-related consequences for the marginal investor (see Elton, Gruber and Blake (2005), Green and Rydqvist (1999), McDonald (2001), Graham, Michaely and Roberts (2003), Bell and Jenkinson (2002), and numerous others).[5] Under this hypothesis, the taxability of dividends for the marginal investor causes the price drop on ex-dividend days to be equal to the after-tax value of the dividend to the marginal investor (which will be less than the face value).

Subject to the possibility of dividend clienteles having price pressure before the ex-day (as discussed above), theories of the ex-day tend to predict that price increases should be limited to the ex-day itself. As a result, our main test is whether the price effects in the dividend month are limited to the ex-day itself.

#### 2.3.2 Announcement Returns, Risk and Pessimism

[5] Other proposed explanations for the ex-dividend day effect include microstructure arguments (Dubofsky (1992), Bali and Hite (1998), Frank and Jagannathan (1998), and others), and dynamic clientele models related to taxation (e.g. Rantapuska (2007), Koski and Scruggs (1998), Graham and Kumar (2006) Felixson and Liljeblom (2008)). For a discussion of the literature exploring why firms pay dividends, see Allen and Michaely (2003)).

A smaller literature has examined the returns on dividend announcement days, most notably Kalay and Loewenstein (1985) and Eades, Hess and Kim (1985). Both papers find that dividend announcements have positive returns, and Eades, Hess and Kim (1985) find that aggregate returns are positive even if dividend omissions are included. Kalay and Loewenstein (1985) argue that the high returns could be explained by risk, as stock returns are also more volatile on announcement days. This explanation could potentially apply to periods other than the announcement day as well. A risk explanation predicts that dividend months should exhibit either loadings on standard factors (for systematic risk), or higher volatility (for both systematic and idiosyncratic risk).

Eades, Hess and Kim (1985) argue that investors may be overly pessimistic about the likelihood of the firm being able to continue dividend payment. In such a case, then they should on average experience a positive surprise around the period when announcements are expected. One way to distinguish this explanation is that if investors are overly pessimistic, the returns effect should be limited to the announcement itself, as this is when the news is released.

### 2.3.3 Interim Returns, Post Period Returns and the Brennan (1970) model

Returns during the interim period between the announcement and the ex-day have received less systematic study. Empirically, Lakonishok and Vermaelen (1986) find that the five days before the ex-day have abnormal positive returns. Eades, Hess and Kim (1985) examine the period around the announcement day, and find that after controlling for ex-day effects there are not abnormal returns after dividend announcements. In terms of the post-period returns, Lakonishok and Vermaelen (1986) find that the five days after the ex-day have negative returns.

Theoretically, there are fewer models that make clear predictions of high returns in the interim period. One possible explanation is in Brennan (1970), which provides an asset pricing model of taxes, risk, and tax clientele effects. The Brennan (1970) model predicts that pre-tax risk-adjusted returns should be higher for companies with a higher dividend yield. This would predict that dividend-paying companies should have high returns on average, including during the interim period. However, as Kalay and Michaely (2000) discuss, the Brennan (1970) prediction is a cross-sectional one: high dividend yield stocks should have high returns in the long run. If the relationship only holds as a time series effect, this is harder to explain as a tax effect.[6] A key distinction between the Brennan (1970) model and price pressure is that price pressure predicts positive returns before the ex-day, but negative returns afterwards. The Brennan (1970) model predicts that long-run returns will be higher for dividend-paying stocks, but does not predict price reversals after dividend payment.

## 3. Data and Summary Statistics

The data on daily and monthly stock returns and dividends come from the Center for Research in Security Prices. Monthly returns run from January 1927 until December 2009. Dividend declaration dates and ex-dividend dates are taken from the CRSP daily file. We consider shares listed on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and NASDAQ exchange. We consider only common shares of US companies (CRSP share code 10 or 11).[7] We also exclude shares with prices less than $5 in the previous month and firms missing a price in the previous month.[8]

[6] The relationship between dividend yield and expected returns has been studied in a number of papers: Litzenberger and Ramaswamy (1979, 1980, 1982) find a relationship between dividend yield and expected return, while Black and Scholes (1974) and Miller and Scholes (1982) do not. Kalay and Michaely (2000) reconcile these results by showing that the relationship between dividend yield and returns holds only when returns are measured in shorter periods (up to a month) around the ex-dividend date, and thus is better understood as a time-series effect, which is less consistent with Brennan (1970).

[7] We thereby exclude ADRs, various ownership units (e.g., limited partnership interests), closed-end funds, REITs, and shares of companies incorporated outside the United States.

[8] When using daily data these restrictions are for the previous day.

For dividend payments, we consider ordinary cash dividends paid in US dollars (CRSP distribution codes starting with '12'). Because we are interested in predicting future dividends, we focus on dividends that are recurring in nature, namely quarterly, semi-annual, and annual dividends (third digits of 3, 4 and 5). We also include unknown and missing frequency dividends (third digits 0 and 1) as being equivalent to a quarterly dividend.[9] Overall, 65.9% of firm/month observations paid some cash dividend in the prior 12 months. 89.07% of all dividend observations are quarterly, 1.49% of dividends are semi-annual, 0.47% are annual, and 8.28% are of unknown or missing frequency. Because we are generally examining dividend vs. non-dividend months for companies, we exclude companies that paid a monthly dividend in the previous 12 months unless otherwise noted (0.7% of dividend observations).[10] Dividend months refer to months with an ex-date unless otherwise noted. Table I presents summary statistics for companies that paid a dividend in the past 12 months and those that did not.

## 4. Results

### 4.1 Predicted Dividend Months and Raw Returns

In this section we explore the question of whether dividend-paying stocks have different returns in months of expected dividend payment. The concept of *expected* dividend payment is an important one, as actual dividend payment involves both a news component and a predictable component. Because companies are reluctant to omit dividends (John and Williams (1985), Bernheim (1991), Nissim and Ziv (2001)), conditioning on the existence of a dividend announcement will exclude the negative returns of dividend omissions, resulting in a sample with high returns, as in Kalay and Loewenstein (1985). However, because announcements are

[9] Thereby not counting year-end or final, special, interim and non-recurring dividends as dividend observations. The main results are robust to their inclusion, as well as being robust to excluding unknown and missing dividends.
[10] Results are robust to the inclusion of monthly dividend observations. The results are also very similar if only quarterly dividends are included.

not known with certainty ahead of time, this portfolio is not tradable. Instead, the relevant asset-pricing question is whether there are high returns in the periods when an announcement is expected. This will address the fact that returns are lower if the announcement is delayed (Kalay and Loewenstein (1986)) or if the dividend is omitted (Eades, Hess and Kim (1985)).

Precisely because companies are reluctant to omit dividends, the existence of a dividend payment is quite predictable using the timing of past payments. We forecast using the following rule: a company has a 'predicted dividend' in month *t* if it paid a quarterly dividend in months *t-3, t-6, t-9,* or *t-12,* a semi-annual dividend in months *t-6* or *t-12,* an annual dividend in months *t-12,* or a dividend of unknown frequency in months *t-3*, *t-6*, *t-9,* or *t-12.* In Table II, we explore how returns vary based on the timing of past dividends. In Panel A, we consider dividends of all frequencies (monthly, quarterly, semi-annual, annual, unknown and missing). We group stocks according to when the dividend was paid: 1 month ago, 2 months ago etc. up to 12 months ago.

It is important to note that while the conditioning is on the month that contains the ex-day, this does not mean that it is only the ex-day that is of interest. The median time between the announcement and the ex-day is ten days, and hence the month that includes the ex-day will ex-month will in many cases include at least a large part of the interim period, and often the announcement as well. The advantage of using a monthly returns measure is that it makes it easy to correct for known determinants of expected returns (size, book-to-market¸ momentum) using factor regressions, and the estimates of alpha thus obtained have a clear interpretation in terms of asset-pricing theory and allow for comparison with other anomalies.

Table II Panel A presents average returns, standard deviation of returns and the frequency of dividend payments in the current month according to past dividend timing. It shows the abnormal returns in patterns of returns documented throughout the paper, namely that the returns are higher in months where dividends are expected to be paid. The four months with the highest average returns are the months where a dividend is expected to be paid, namely 12, 6, 3 and 9 months ago (with returns of 1.45%, 1.45%, 1.43% and 1.42% respectively). Average returns are lowest one month after a dividend is expected to be paid (10, 4, 7 months and 1 month ago, with returns of 1.02%, 1.02%, 1.03%, and 1.05% respectively). In addition, expected dividend months also have the *lowest* standard deviation of returns. The four lowest standard deviations of returns are for dividends 3, 9, 6 and 12 months ago (9.61%, 9.65%, 9.66%, and 9.66% respectively). The four most volatile months, by contrast, are the months immediately before an expected dividend (2, 5, 8 and 11 months ago).

The result that the high return dividend months also have lower volatility suggests that the explanation in Kalay and Loewenstein (1985), whereby high announcement day returns also have higher risk, does not seem to hold for the dividend month as a whole. Panel A also documents the persistence of dividend payments. Companies that paid dividends 12 months ago have an 88% chance of paying dividends this month, and for 3, 6 and 9 months ago the percentage of dividends paid is 85%, 85%, and 83% respectively. These numbers are generally slightly higher if only quarterly dividends are considered.

Panel B shows the distribution of monthly returns for portfolios formed using our formal definition of predicted dividends. Months with a predicted dividend have average returns of 1.38%, and a standard deviation of 5.77%. Companies with a dividend in the last 12 months that do not have a predicted dividend this month have average returns of 1.01% and a standard deviation of 5.76%. Companies who did not pay a dividend in the past 12 months have an average return of 1.01%, and a standard deviation of 8.56%. Companies predicted to pay dividends thus have both a higher expected return *and* a lower standard deviation of returns than past payers not predicted to pay dividends this month, and past non-payers. Consequently, predicted dividend payers have the highest Sharpe ratio of the three categories. This suggests that predicted dividend payers are not more risky, a question we turn to next.

### 4.2 Abnormal Returns in Dividend Months

While predicted dividend payers have higher expected returns, the central asset pricing question is whether these higher returns represent compensation for some source of risk that is important to investors. It may be that companies that pay dividends are more exposed to systematic risk, and the high returns reflect this different risk loading. We consider this question in several regards. The first is the level of abnormal returns to predicted dividend payers under standard models of expected returns. The second is to compare predicted dividend payers with other companies – all other companies not predicted to pay a dividend this month ('between companies'), and those that paid dividends in the past year but which are not predicted to pay a dividend in the current month ('within companies').

Systematic risk may be a likely explanation of differences in returns between companies. The short side of the between-companies portfolio will include companies that never pay dividends, as well as dividend-paying companies in non-dividend months. Dividend-paying and non-paying companies differ in many economic respects: as Table I indicates, dividend-paying stocks have larger market capitalization, and a higher book-to-market ratio. Dividend payment may well be correlated with economy-wide risks that investors are concerned about, which may drive differences in returns between dividend-paying and non-dividend-paying stocks.

Systematic risk seems less likely to explain the patterns in returns within companies. By comparing the same set of companies over time, any risk loadings that are constant over time will tend to cancel out. For risk to explain the 'within companies' returns, the systematic risk of the stock must be higher in months of expected dividend payments. It is not clear why dividend payment itself should make the company more risky, so risk-based explanations would need to involve other events during dividend months. The most plausible of these is changes in liquidity, which we examine below (and which loads in the wrong direction to explain the effect).

Table III examines the returns of predicted dividend-paying stocks relative to standard risk factors – the market, size, book-to-market, momentum and liquidity. We form portfolios of stocks based on predicted dividend payment, and regress them on returns of portfolios for excess market returns, SMB, HML, UMD (all from Ken French's website), and in some specifications the Pastor and Stambaugh (2003) liquidity factor:

$$R_{PredDiv,t} - R_f = \alpha + \beta_{Mkt\text{-}Rf} {*} R_{Mkt\text{-}Rf,t} + \beta_{SMB} {*} R_{SMB,t} + \beta_{HML} {*} R_{HML,t} + \beta_{UMD} {*} R_{UMD,t} + \varepsilon_t \quad (1)$$

Table III Panel A shows the abnormal returns relative to a four factor model ($\alpha$ in the above regression) for predicted dividend payers versus other stocks. In each case, the long portfolio is the average return of all predicted dividend payers, equal-weighted or value-weighted according to the specification. We consider several different short portfolios – all companies that are not expected to pay a dividend this month, companies that paid a dividend in the past year but are not expected to pay this month, and companies one month after they are expected to pay a dividend. The first short portfolio corresponds to the 'between companies' question– do expected dividend payers have higher returns than companies not expected to pay a dividend? The other two are 'within companies' tests. They consider the same set of companies that paid a dividend in the past 12 months, and take a long position in months where they are expected to pay a dividend and a short position in other months.

Panel A shows that predicted dividend payers have significantly positive abnormal returns. An equal-weighted portfolio of predicted dividend-payers has abnormal returns of 41 basis points per month (with a t-statistic of 8.51), while a value-weighted portfolio of predicted dividend-payers has abnormal returns of 24 basis points per month (with a t-statistic of 6.84).

Predicted dividend payers also have high returns relative to the comparison portfolios. A portfolio that is long predicted dividend payers and short all other companies ('between companies') earns abnormal returns of 53 basis points per month on an equal-weighted basis (t-statistic of 12.31) and 32 basis points on a value-weighted basis (t-statistic of 6.72). The portfolio of all companies other than predicted dividend payers has significantly negative returns: -13 basis points for equal weighted portfolios (t-statistic of -3.45) and -8 basis points for value-weighted portfolios (t-statistic of -4.60).

Perhaps more importantly, predicted dividend payers have abnormal returns relative to past dividend payers in other months ('within companies'). This can be seen in the portfolio that is long predicted dividend payers and short all other companies with a dividend in the last 12 months. The 'within companies' difference portfolio earns abnormal returns of 37 basis points on an equal-weighted basis (t-statistic of 15.50) and 29 basis points on a value-weighted basis (t-statistic of 6.77). The effect is larger when shorting companies only in the month immediately after a predicted dividend. In addition, the portfolio that is short companies one month after a predicted dividend earns abnormal returns of -18 basis points per month when value-weighted (t-statistic of -4.47), although the effect is smaller on an equal-weighted basis. This is consistent with dividend-seeking investors creating selling pressure after the dividend has been paid.

Table III Panel B shows that the abnormal returns to predicted dividend payers are similar under different models of expected returns. For the 'between companies' difference portfolio, monthly abnormal returns are 51 basis points under a CAPM (t-statistic of 10.21), 52 basis points under the Fama and French (1993) 3 factor model (t-statistic of 12.41), 53 basis points when the momentum factor is added (t-statistic of 12.31) and 52 basis points when the Pastor and Stambaugh (2003) liquidity factor is added (t-statistic of 9.93). For the ‘within companies’ result, the abnormal returns are similar for the CAPM, 3 factor and 4 factor models, and adding the liquidity factor makes the effect larger, to 44 basis points per month with a t-statistic of 16.92.

Panel B also shows the loadings on excess market returns, SMB, HML, UMD and LIQ (all taken from the 4 factor plus liquidity regression). The ‘within companies’ portfolio has insignificant loadings on excess market returns, SMB, HML and UMD. This is consistent with the earlier argument that this difference portfolio has little exposure to risk factors that are constant over time because it operates within a set of companies. The only slightly significant loading is on the liquidity factor (-0.0156, t-statistic of -2.09). However the loading on liquidity is *negative* –companies have less liquidity risk in months of predicted dividend payment, not more. This explains why the alpha gets larger when adding liquidity to the four factor model.

Overall, Table III provides strong evidence of abnormal returns for predicted dividend payers. These returns are not driven by standard factors, and are unlikely to be driven by other factor loadings that remain constant through time. To demonstrate the relative size of the anomaly, Figure 1 plots the cumulative value of the within-companies portfolio starting with an initial investment of $1 on December 31, 1927. For comparison, the cumulative value the SMB and HML portfolios are also shown. The final value in December 2009 is $34.46 for the dividend month premium, versus $6.78 for SMB and $30.52 for HML. The dividend month premium is also less volatile than either SMB or HML.

**4.3 Daily returns within dividend months**

To examine the extent to which price pressure is contributing towards the dividend month premium, we examine daily returns within dividend months. In the current context, if returns are driven by price pressure they will have the following testable predictions:

1. If returns (announcement, interim, ex-day) are driven by price pressure, they should lead to reversals after dividend payment.
2. If returns are driven by price pressure, then they should be greater in cases where investor trades are likely to have a bigger price impact, such as when there is less liquidity and when there is more demand for the shares. Such cases should also experience larger subsequent reversals.

In terms of alternative hypotheses, we consider the following:

3. If the effect is driven by investors being positively surprised by dividend news, then the returns should be concentrated around the dividend announcement (when the actual news is revealed, and investors are positively surprised).
4. If the effect is driven by the direct tax effects from dividend payment (as in Elton and Gruber (1970), the effect should be concentrated on the ex-dividend day itself, when the tax treatment changes.
5. If the effect is driven by Brennan (1970) model, higher dividend yields should be associated with higher returns in all periods.

While our results do not rule out the existence of the alternative explanations above, we are interested in examining the extent to which they explain the entirety of the returns available in the dividend period. To evaluate this, we calculate the characteristic-adjusted returns for dividend-paying companies in different periods around dividend payment.[11] Similar to Daniel, Grinblatt, Titman and Wermers (1997), we sort stocks into quintiles based on their market capitalization, book value of equity divided by market value of equity (as in Fama and French (1992)) and returns from t-20 days to t-250 days (thus computing a daily analog of months t-2 to t-12), and match the stock to the portfolio with the same quintiles of each variable. Characteristic-adjusted returns are then the returns of the stock minus the returns on the portfolio matched on size, book-to-market ratio and momentum.

Ex-dividend days are taken from the CRSP daily file, as are dividend declaration days. A tradable strategy using the declaration date must use the *predicted* declaration days, since the actual declaration day will not be known in advance. Predicted dividend days are taken to be 63 trading days after the last dividend declaration day.[12] We calculate returns for the actual declaration day, the predicted declaration day, the interim period (one day after declaration until one day before the ex-day), the ex-day, and the 40 days after the ex-day. For the daily returns, we limit the sample to quarterly dividends.

We examine the patterns in daily returns in Table IV. Panel A presents the mean characteristic-adjusted returns for each of the periods described above. The actual declaration day has average adjusted returns of 11.7 basis points, the predicted declaration day has adjusted returns of 3.0 basis points, the interim period has adjusted returns of 15.8 basis points, the ex-day has adjusted returns of 26.6 basis points, and the 40 day period after the ex-day has adjusted returns of -73.2 basis points (with all means being highly statistically significant). Put differently,

[11] Using characteristic-adjusted returns allows for easy comparisons of cumulative abnormal returns for different lengths of time. If returns are calculated using daily calendar-time portfolios and abnormal returns using daily four-factor alphas, the results are very similar.

[12] This is roughly the average number of trading days per year divided by 4. The results are very similar if predicted dividend days are taken as 3 months from the average date of the last 4 dividends, or if predicted dividends are taken by adding in the average gap between the last 4 dividends. More complicated rules are possible which rely on day-of-the-week estimates, and these will lead to greater accuracy – see Kalay and Loewenstein (1986) and Graham, Koski and Loewenstein (2006).

out of the total effect of 54.2 basis points from announcement to ex-day, 21.6% is due to the declaration day, 29.2% is due to the interim period, and 49.1% is due to the ex-day. For taxable investors, the after-tax return on the ex-dividend day will be less, but tax-free investors such as charitable institutions would be able to receive the full ex-dividend return. [13]

To illustrate the pattern in daily returns, particularly within the interim period, Figure 2 plots the daily characteristic-adjusted returns around the ex-dividend date, from 30 days beforehand until 60 days afterwards. Around the ex-dividend date returns increase as the ex-day approaches, with the largest abnormal return on ex-dividend day, with. Returns then generally become negative in period between dividends, becoming larger again as the next dividend approaches. Figure 3 presents returns centered around the announcement date. The largest returns are on the announcement day and the day afterwards, decreasing over time but still significantly positive for nearly all of the 25 subsequent trading days. Importantly, the returns after the announcement are not driven by companies with an ex-day over the subsequent days, as we exclude ex-day observations from the sample. The results in Figure 3 contrast with Eades, Hess and Kim (1985), who find abnormal returns only on the announcement day. We examine a much longer time period than their study, which may account for the different results.

If the positive returns in dividend periods are driven by price pressure, we may expect them to be associated with increases in trading volume. We examine the daily abnormal trading volume around the ex-day and the announcement day, with abnormal volume computed as:

$$AbnormalVolume_t = (Volume_t - 250DayAvgVolume_t)/\ 250DayAvgVolume_t$$

Where Volume is the daily trading volume (adjusted for stock splits, etc.) and *250DayAvgVolume* is the average daily volume over the previous 250 trading days taken over

[13] Rantapuska (2007) examines individual trading behavior and finds that tax advantaged traders do in fact engage in overnight trades to take advantage of ex-day effects, earning significant returns.

days when the share actually traded, where there are at least 120 non-missing volume observations). Abnormal volume is thus a time-series measure computed on a rolling basis, comparing each day's volume as a percentage change relative to the previous yearly average. We plot the average level on each day, and compute the t-statistics for each mean (with red bars indicating a t-statistic greater than 2).

Figures 4 and 5 present abnormal daily volume around the ex-day and announcement day, respectively. The patterns in volume are similar to the patterns in returns in Figures 2 and 3. Around the ex-day (Figure 4), abnormal volume is significantly positive in the lead up to the ex-day (peaking at almost 15% above average on the day before the ex-day), and significantly negative afterwards. High volume periods are generally associated with high return periods, and vice versa for negative returns after the ex-day. The only exception to this pattern is the ex-day itself, which has very high returns in Figure 2, but considerably less abnormal volume than the days beforehand. Around the announcement day (Figure 5), abnormal volume is significantly negative before the announcement, and significantly positive on the announcement day and the 10 days afterwards. The largest abnormal volume is actually the day *after* the announcement (at around 15% higher than average). The strong relationship between returns and volume is consistent with price impact from investor trades. This result complements the findings in Michaely and Vila (1996) that volume increases in the period around ex-day.

We next investigate how the dividend month returns are related to liquidity, in Table IV Panel B. Karpoff and Walkling (1988) and Karpoff and Walkling (1990) find that ex-day returns are related to the level of spreads and transaction costs. We extend this to examine how liquidity and price impact affect returns during the rest of the dividend cycle, using two measures of liquidity. First, we examine the measure of illiquidity used in Amihud (2002), defined as $Illiq_{i,t}$ =

– ———, where *VOLD* is the dollar volume that day, and *D* is the number of days where the stock traded (over the past 250 days). The measure is multiplied by 1000, and winsorized at the 1% level. For each return period (announcement, interim period, etc.), the measure is taken from 5 days before the announcement to 255 days before the announcement, where there are at least 120 days with some trades. The Amihud measure captures how large a price movement is associated with each dollar traded, which reflects well the idea of price impact we are interested in. Larger measures are associated with less liquid securities.

Second, we consider the length of the interim period between the declaration and the ex-dividend day. Because liquidity has a time dimension, when traders need to execute their orders over a shorter period they are likely to have more price impact. In all cases, we predict that less liquid companies will exhibit greater price pressure before the dividend payment, and greater reversals afterwards. All standard errors are clustered by firm and by day.

The results indicate that lower levels of liquidity are associated with higher interim and ex-day returns, and larger reversals. When examining the effect of the length of the interim period, for interim returns the coefficient is -0.130, for ex-date returns the coefficient is -0.020, and for the 40 day post-period the coefficient is 0.117 (all significant at a 1% level). A one standard deviation increase in the length of the interim period is 11.3 days (which gives 1.13, as the variable is divided by 10), corresponding to interim returns being lower by 14.7 basis points, ex-day returns being lower by 2.3 basis points, the post period returns being higher (i.e. less negative) by 13.2 basis points.

For the Amihud (2002) illiquidity measure, we find that less liquid securities also exhibit larger interim and ex-day returns, as well as greater reversals. The coefficient on interim returns is 26.46, the coefficient for the ex-day is 18.08, and the coefficient for the forty days after the ex-day is 82.66, all significant at a 1% level. The standard deviation of the Amihud measure is 0.00266, meaning that a one standard deviation increase in illiquidity is associated with higher interim returns by 7.0 basis points, higher ex-day returns by 4.8 basis points, and lower (i.e. more negative) returns in the subsequent forty days by 11.7 basis points. Overall, Table IV indicates that dividend month returns are related to liquidity, consistent with their being associated with price pressure. Liquidity affects both the size of the initial price increase, and the size of the subsequent reversal.

### 4.4 Dividend Month Returns and Proxies for Dividend Demand

Next, in Table V we examine how the returns in each period may be affected by shifts in the demand for shares. We consider two variables that may point to higher demand from dividend-seeking investors. The first is the dividend yield. We measure this as the average from the previous 12 months of dividends payment (in months that included a dividend), divided by the share price from the previous month. If investors desire dividends, either due to catering, or due to tax-arbitrage trades, they will likely have a larger desire for companies that pay larger dividends. This presents a test of the Brennan (1970) model as well – under this model, dividend yield should be associated with higher returns in all periods, whereas under price pressure it should lead to higher price increases up to the ex-day, and higher reversals afterwards.

The second variable is recessions, which we use to examine how returns in each period vary in the time-series. While the underlying source of demand in the Baker and Wurgler (2004) catering model is not specified, if it derives from a psychological aspect (as Baker and Wurgler (2004) suggest), it may be due to a desire for the safe and secure payouts that dividends represent. Dividends tend to be less volatile than prices (Shiller (1981)). If investors view dividends and capital gains in separate mental accounts (Thaler (1980)), they may perceive dividends to guarantee a certain level of returns in the future. Investors who fail to appreciate the Miller and Modigliani (1961) argument that issuing dividends will reduce the share price, and thus should be irrelevant in the absence of taxes and frictions, may view dividends as being a guaranteed source of returns, while viewing unrealized capital gains as risky.

These possibilities suggest that the demand for dividends will be higher during periods of aggregate economic uncertainty. In such times, risk aversion is higher and the availability of alternative safe assets is reduced, making dividends especially attractive. We examine whether the dividend month premium larger in recessions, taken from the National Bureau of Economic Research definitions.

We consider these questions in Table V. The methodology is similar to Table IV – characteristic adjusted returns from the declaration, interim, ex-day, and post-period are regressed on the dividend yield, and on a dummy for recessions. For dividend yield, the results indicate that higher dividend yields are associated with higher interim and ex-date returns, but lower post-period returns (i.e. larger reversals). The coefficient on interim is 0.403, the coefficient on ex-day is 0.069, and the coefficient on 40 day post period is -0.542 (all significant at a 1% level when clustered by firm and day). A one standard deviation increase in dividend yield is 0.65%, corresponding to an additional 26.2 basis points during the interim period, an additional 4.5 basis points on the ex-day, and lower returns by 35 basis points in the post-period.

The fact that we observe lower returns in the post period when dividend yields are higher is difficult to reconcile with Brennan (1970), which predicts high returns from dividend yields in each period. The fact that the more negative post-period returns tend to offset the higher interim and ex-day returns is consistent with Kalay and Michaely (2000), who find no relationship between dividend yield and returns when measured over quarterly or longer horizons, and thus argue that the effects of dividend yield tend to operate in the time series. To this extent, our findings that the aggregate returns in dividend months are high due to a within-firm time-series effect is consistent with their findings.

For recessions, we also find that interim and ex-day returns are higher, but post-period returns are lower (i.e. reversals are larger). Interim returns are larger by 11 basis points during recessions (significant at a 5% level), ex-day returns are higher by 8 basis points (significant at a 1% level), and post period returns are lower by 26 basis points (significant at a 1% level). For both dividend yields and recessions, announcement day returns are not significantly different.

Overall, these results give support to the explanation of price pressure. The large effects during the interim period occur when there is no news about the dividend, and when holding the share does not subject the investor to additional tax consequences, as the dividend is not received unless the stock is held until the ex-dividend day. There are returns on the announcement date (consistent both with investors being positively surprised, and dividend-seeking investors purchasing once they know a dividend is coming). However, returns are also high in days following the announcement, suggesting continued price pressure. In the period after the dividend, the returns are negative. The fact that both interim returns and subsequent returns are related to measures of liquidity and measures of investor demand tends to support the view that price pressure is indeed occurring.

## 5. Alternative Explanations

### 5.1 Potential Alternative Explanations

There are a number of other potential alternative explanations that may cause high returns during dividend months. One possibility is other events that coincide with dividend months. If dividend-paying months coincide with earnings announcement months, the dividend month premium could be picking up the earnings announcement premium (Beaver (1968), Frazzini and Lamont (2008)). Another potential explanation lies in the seasonality in returns identified in Heston and Sadka (2008), where returns in 12 months increments (12 months ago, 24 months ago etc.) predict current month returns. The dividend month effect may be driven by news contained in the dividend announcements, or by calendar-month effects, for instance by being concentrated in certain months of the year such as January (Keim (1983)). We investigate all of these possibilities in the following sections.

### 5.2 Returns Sorted By Dividend Frequency

Since most dividends in the sample are quarterly, the dividend month returns may be driven by some other event with similar quarterly timing to dividends. To examine whether the patterns in returns are linked to dividends specifically, we examine dividends of different frequencies. If the effects are driven by dividends, then companies that pay dividends on a semi-annual basis should show abnormal returns for dividends 6 months ago and 12 months ago, but not for 3 or 9 months ago. Similarly, annual dividend payers should only show abnormal returns for dividend payments 12 months ago, but not 3, 6 or 9 months ago. We test these predictions in Table VI, which shows the intercepts from a four-factor regression according to the time since payment (1 to 12 months ago) and dividend frequency (all dividends, quarterly, semi-annual, annual, monthly, and unknown).

Table VI shows that the patterns in abnormal returns match the frequency of the dividends, providing support for the proposition that the abnormal returns are a property of dividend-paying months specifically, rather than some other quarterly event. Companies with quarterly dividends have abnormal returns 3, 6, 9 and 12 months after dividend payments (with abnormal returns of 65, 54, 51, and 49 basis points per month respectively, each with t-statistics above 10). Companies with semi-annual dividends have abnormal returns 6 months after dividend payment (115 basis points, t-statistic of 5.63) and 12 months after payment (82 basis points, t-statistic of 4.13), but *not* for dividends paid 3 months ago or 9 months ago. For annual dividends, the results are somewhat weaker – payment 12 months ago generates abnormal returns of 58 basis points, although the t-statistic is only 1.78, but there are not abnormal returns for 3, 6 or 9 months ago. These weak results may be partly due to the small number of annual dividend observations (only 0.8% of dividend months are annual, and each annual-dividend firm is in the long portfolio only one month per year).

### 5.3 Earnings Months, Seasonality

If dividend-paying months coincide with earnings announcement months, then the dividend-month effect may be merely proxying for months with earnings announcements. In such a case, the dividend month premium ought to disappear once we control for whether the month had an earnings announcement or not. To investigate this, we split the dividend month sample into those months with an earnings announcement and those without, and compare the within-companies portfolio for each category.

Another possibility is that the dividend month premium is measuring the effects of seasonality, as in Heston and Sadka (2008). This result finds that monthly returns at 12 months intervals tend to predict returns in the current month. They form their portfolios based on the average returns of the stock from 12, 24, 36, 48 and 60 months ago. To test whether this effect is driving our results, we form a two-way sort, based on predicted dividend payment, and also on whether companies are above or below the median of the Heston and Sadka (2008) variable. We then regress these returns on the excess market return, SMB, HML and UMD portfolios.

We test these predictions in Table VII, and find that neither earnings months nor seasonality explain the dividend month announcement premium. For earnings, the within-companies dividend month premium is 39.2 basis points in months with earnings announcements, versus 37.1 basis points per month for non-earnings months, with the double difference portfolio showing insignificant abnormal returns. For the Heston and Sadka (2008) double sort, the dividend month premium is 7 basis points higher in the high Heston and Sadka (2008) firms, but the difference is not significant (t-statistic of 1.52). The dividend month premium is positive and significant in all specifications – earnings and non-earnings months, high and low seasonality returns.

### 5.4 Dividend News

Another possibility is that the dividend month premium is masking an effect related to news about the dividends. A number of papers have examined whether news in dividends (such as increases, decreases, omissions and initiations) is able to predict future returns (Fama and French (1998), Fama and French (2000), Liu, Szewcyk and Zantout (2008), Fuller and Goldstein (2011)), and future earnings (Bernartzi, Michaely and Thaler (1997), DeAngelo, DeAngelo and Skinner (1996), Nissim and Ziv (2001), Grullon, Michaely, Bernartzi and Thaler (2005)).

We examine below whether the results differ in months following past dividend increases, decreases, omissions, and constant dividends. To keep the timing of changes consistent, we restrict the study to quarterly dividends, and examine cases where a given month is predicted to have a dividend and there was also a dividend increase (or decrease or omission, respectively) in the previous 12 months. Companies with a constant dividend are companies without any increase, decrease or omission in dividends in the previous 12 months. We then compare these portfolios to the returns of companies with past dividend increases (decreases, omissions, constant dividends) that are not predicted to pay a dividend this month. As before, we regress these returns on Mkt-Rf, SMB, HML and UMD portfolios.

Table VIII presents these results. The dividend month premium is positive and significant for all categories of past dividend changes where dividends were actually paid: increases, decreases and constant dividends. The monthly abnormal returns for the within-companies portfolio are 45.3 basis points for dividend increases, 40.3 basis points for constant dividends, and 66.2 basis points and for dividend decreases. This indicates that the positive returns are not simply a proxy for the sign of dividend news. By contrast, there is no dividend premium when the company omitted dividend payment. This is important, as it suggests that the abnormal returns are coming from the dividend payments themselves, and when dividends disappear, so does the anomaly.

Another way to examine whether the main results are proxying for dividend news is to examine how persistent the effects are over time. The more stale the dividend information is, the less likely that it still contains value-relevant news about the dividends. To examine this question, we use earlier time periods to predict current dividend payments. We use the definition of ‘predicted dividend in lag year’ and ‘other companies with dividend in lag year’ (similar to the within companies definition) and lag these values by 12, 24, 36 months etc. For instance, a lag of 60 means that a company has a predicted dividend if it paid a dividend 63, 66, 69 or 72 months ago, while ” other companies with dividend in lag year” paid a dividend 61, 62, 64, 65, 67, 68, 70 or 71 months ago. To make sure that the survivorship bias is the same between the long and short portfolios, we restrict the sample to include only firms with data from lag month+12. We examine the returns to the long/short portfolios regressed on a four-factor model as before.

Table IX presents these results. Abnormal returns are present using up to 20 year old dividend data for equal-weighted portfolios (11 basis points per month, with a t-statistic of 3.33), and up to 16 year old data for the value-weighted portfolio The returns gradually become smaller in both magnitude and significance, as some past dividend payers stop paying dividends and other past non-payers initiate payments. Figure 6 shows the abnormal returns to portfolios formed on a simpler definition of paying any dividend at each monthly horizon. In these figures, portfolios are formed that are long if a company paid a dividend X months ago and short if the company did not. The figures plot the four-factor intercepts for equal-weighted portfolios in Panel A and value-weighted portfolios in Panel B. The results are difficult to reconcile with the effect being driven by dividend news, unless the news has persistent effects at a 20 year horizon.

### 5.5 Calendar and Seasonal Effects, Sub-Periods

Finally, we examine whether the returns are concentrated in certain months of the year such as January (Keim (1983)), hold only in particular sub-periods, or have been eliminated in recent years. We investigate these possibilities in Table X. Panel A presents the standard 'within companies' results using only returns from each calendar month of the year. The results show that the returns are not concentrated in any particular month of the year, and the abnormal returns are significant at a 5% level in 10 out of the 12 calendar months and significant at a 10% level in all months. Panel B examines the returns to the 'within companies' strategy during four sub-periods: 1926-1945, 1946-1965, 1966-1985 and 1986-2009. The equal-weighted portfolio had economically and statistically significant four-factor alphas in all four sub-periods, ranging from 79 basis points per month during 1926-1945 to 21 basis points per month during 1946-1965.

## 6. Conclusion

In this paper, we document a robust price pattern – companies have predictably higher returns in months when they are expected to pay a dividend. Simple difference portfolios produce abnormal returns of 37 to 53 basis points per month relative to a four-factor model, with some specifications producing abnormal returns as high as 115 basis points per month. We argue that the effect is consistent with price pressure from dividend-seeking investors in the lead-up to the ex-day. To this end, we document the existence of substantial returns in the interim period between announcement and ex-day (around 29% of the total returns of the whole dividend period), and significant reversals in the 40 days after the ex-dividend day, both of which are difficult to explain by the immediate effects of either news or taxes. We provide further evidence for price pressure by relating both the positive returns up to the ex-day and the subsequent reversals to measures of liquidity, and measures of demand for dividends.

We argue that a demand for dividends which increases as the dividend approaches is broadly consistent with models of dividend clienteles or dividend catering. The existence of price pressure from such groups is also a potential implication of such models. But our results nonetheless pose a puzzle – why do dividend-seeking investors not purchase the stock slightly earlier, and thereby secure both the dividend *and* the abnormal returns? Given that the median duration between the dividend announcement and the ex-day is only ten days, and those days contain substantial abnormal returns, it is not clear why investors who planned on buying before the ex-day should be reluctant to buy the share a few days earlier. This question is indeed a challenging one, both from the perspective of investor rationality and models of dividend payment, and one for which we do not have a clear answer.

We also argue that stock returns during dividend months represent a substantial asset-pricing anomaly. The dividend month premium is indeed a quite striking effect. It is as large as the value premium, but with less volatility. It survives a wide battery of control variables. It holds on both a value-weighted and equal-weighted basis. It is driven mainly by the long side of the portfolio. It is highly persistent, and abnormal returns are available sorting on 20 year old data. Because of its operation within a given set of companies, it appears quite unlikely to be driven by risk. These facts do not seem to be broadly appreciated in the literature that examines dividends and stock returns as a way of understanding why firms pay dividends in the first place. Our results appear at odds with market efficiency, and suggest that prices are not fully incorporating information about the predictable component of dividend payments.

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## Table I - Summary Statistics

Panel A - Firms with a Dividend in the Past Year

| | N | Mean | Std. Dev. | 25% | Median | 75% |
|---|---|---|---|---|---|---|
| Market Cap ($m) | 1,329,168 | 1,602 | 9,922 | 32 | 116 | 528 |
| Book-to-Market | 873,373 | 0.8948 | 1.6265 | 0.4461 | 0.6987 | 1.0771 |
| Turnover | 1,231,510 | 0.4853 | 0.9026 | 0.1041 | 0.2373 | 0.5411 |
| Bid-Ask Spread | 533,408 | 0.0250 | 0.0387 | 0.0053 | 0.0144 | 0.0313 |
| Dividend Yield | 4,296 | 0.0152 | 0.0598 | 0.0036 | 0.0070 | 0.0145 |
| Number of Firm Months | 1,329,168 | | | | | |
| Number of Firms | 8,753 | | | | | |

Panel B - Firms with No Dividend in the Past Year

| | N | Mean | Std. Dev. | 25% | Median | 75% |
|---|---|---|---|---|---|---|
| Market Cap | 688,149 | 818 | 5,995 | 31 | 103 | 391 |
| Book-to-Market | 520,645 | 0.8211 | 3.0851 | 0.2928 | 0.5447 | 0.9682 |
| Turnover | 658,234 | 1.3328 | 2.0423 | 0.2788 | 0.7083 | 1.6522 |
| Bid-Ask Spread | 484,336 | 0.0263 | 0.0435 | 0.0036 | 0.0150 | 0.0339 |
| Number of Firm Months | 688,149 | | | | | |
| Number of Firms | 13,314 | | | | | |

Panel C - Distribution of Dividend Frequencies

| Dividend Frequency | Pct of Firm/Months with Dividend in the Last Year | Pct of Dividend Observations |
|---|---|---|
| Any Frequency | 65.89 | |
| Monthly | 0.18 | 0.70 |
| Quarterly | 56.91 | 89.07 |
| Semi-Annual | 2.02 | 1.49 |
| Annual | 1.06 | 0.47 |
| Unknown Frequency | 7.67 | 8.28 |

This Table presents summary statistics for companies according to whether they paid a dividend in the past 12 months, using monthly data from January 1927 to December 2009. Panel A presents information for companies that paid a cash dividend in the past 12 months, and Panel B presents information for companies that did not pay a cash dividend in the past 12 months. Panel C presents examines the distribution of dividend frequencies

## Table II - Returns and the Probability of Current Dividend Payment, Sorted By Timing of Past Dividends

### Panel A - Raw Returns and Dividend Payments

| Months Since Dividend Payment | Returns in Current Month Given Dividend Payment N Months Ago | | Probability of Dividend in Current Month Given Dividend Payment N Months Ago | |
|---|---|---|---|---|
| | Mean Return | Std. Deviation | All Dividends | Quarterly Dividends |
| 1 | 1.05 | 9.72 | 0.009 | 0.001 |
| 2 | 1.18 | 9.82 | 0.060 | 0.053 |
| 3 | 1.43 | 9.61 | 0.853 | 0.879 |
| 4 | 1.02 | 9.73 | 0.062 | 0.054 |
| 5 | 1.20 | 9.85 | 0.066 | 0.057 |
| 6 | 1.45 | 9.66 | 0.853 | 0.862 |
| 7 | 1.03 | 9.75 | 0.067 | 0.058 |
| 8 | 1.19 | 9.88 | 0.064 | 0.056 |
| 9 | 1.42 | 9.65 | 0.835 | 0.854 |
| 10 | 1.02 | 9.78 | 0.065 | 0.057 |
| 11 | 1.17 | 9.88 | 0.051 | 0.040 |
| 12 | 1.45 | 9.66 | 0.880 | 0.878 |

This Table presents the monthly stock returns of companies according to the timing of the past dividend payments, using monthly data from January 1927 to December 2009. Panel A examines the average returns and probability of dividend payment in the current month based on payment of dividends in previous months. In Panel A, averages are taken over all firm/month combinations. Months lagged indicates a company had a dividend lagged the indicated number of months in the past. ‘All Dividends’ refers to all regular cash dividends paid in US dollars (distributions with the first two digits of the CRSP DISTCD variable equal to 12 with the third digit less than 6). ‘Quarterly Dividends’ refers only to quarterly cash dividends. Panel B presents the distribution of returns according to companies predicted to pay a dividend this month, companies who paid a dividend in the past 12 months but are not predicted to pay in the current month, and companies that didn’t pay a dividend in the past 12 months. In Panel B, returns are time-series averages for portfolios, formed by aggregating companies into portfolios each month. Dividends are predicted in the current month if a quarterly dividend was paid 3, 6, 9, or 12 months ago, if a semi-annual dividend was paid 6 or 12 months ago, or if an annual dividend was paid 12 months ago. The Sharpe Ratio is equal to average returns minus the risk free rate, divided by the standard deviation of returns. All columns listing percentiles are for monthly returns.

| Panel B - Returns Based on Predicted Dividends | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean Return | Std. Deviation | Sharpe Ratio | 1% | 5% | 25% | Median | 75% | 95% | 99% |
| [1] Predicted Dividend Month | 1.38 | 5.77 | 0.188 | -16.10 | -7.25 | -1.28 | 1.67 | 4.28 | 8.77 | 15.97 |
| [2] All Other Companies with a Dividend in the Last 12 Months | 1.01 | 5.76 | 0.124 | -16.49 | -8.07 | -1.54 | 1.48 | 3.91 | 8.32 | 15.01 |
| [3] All Other Companies with NO Dividend in the Last 12 Months | 1.01 | 8.56 | 0.083 | -22.92 | -12.67 | -3.35 | 1.39 | 5.41 | 13.18 | 22.20 |
| Portfolio Long [1] and Short [2] | 0.37 | 0.71 | 0.097 | -1.26 | -0.75 | -0.06 | 0.34 | 0.76 | 1.52 | 2.36 |
| Portfolio Long [1] and Short [3] | 0.37 | 3.84 | 0.019 | -10.82 | -5.88 | -1.47 | 0.40 | 2.31 | 6.24 | 9.46 |

## Table III - Abnormal Returns in Predicted Dividend Months

### Panel A - Four Factor Alphas For Difference Portfolios Based on Predicted Dividends

| | Equal Weighted | | | Value Weighted | | |
|---|---|---|---|---|---|---|
| **Long** | Predicted Dividend | Predicted Dividend | Predicted Dividend | Predicted Dividend | Predicted Dividend | Predicted Dividend |
| **Short** | All Other Companies | All Other Past Dividend payers | Dividend 1, 4, 7, or 10 Months Ago | All Other Companies | All Other Past Dividend payers | Dividend 1, 4, 7, or 10 Months Ago |
| **Long** | 0.407 *** | 0.407 *** | 0.407 *** | 0.239 *** | 0.239 *** | 0.239 *** |
| | (8.51) | (8.51) | (8.51) | (6.84) | (6.84) | (6.84) |
| **Short** | -0.128 *** | 0.030 | -0.051 | -0.084 *** | -0.053 * | -0.180 *** |
| | (-3.45) | (0.65) | (-1.03) | (-4.60) | (-1.88) | (-4.47) |
| **Difference** | 0.534 *** | 0.374 *** | 0.456 *** | 0.323 *** | 0.292 *** | 0.420 *** |
| | (12.31) | (15.50) | (16.30) | (6.72) | (6.77) | (8.12) |

This table presents the results of Fama French 4 Factor regressions of US monthly stock returns based on predicted dividend payment. Portfolios of stock returns are formed based predicted dividend payments, and these are regressed on excess market returns, SMB, HML, and UMD (available from Ken French's website), and in some cases the Pastor and Stambaugh (2003) liquidity factor. Both equal weighted and value weighted portfolios are formed. To be included in the long portfolio a stock needs to have a predicted dividend. A predicted dividend month has a quarterly or unknown dividend 3, 6, 9 or 12 months ago, a semi-annual dividend 6 or 12 months ago, or an annual dividend 12 months ago. Stocks with monthly dividends in the previous 12 months are excluded from the analysis. For the short portfolios, "All Other Companies" contains all companies not included in the long portfolio, "All Other Companies with a Dividend in the Last 12 Months" contains companies that are not in the long portfolio, but have paid at least one dividend in the last 12 months, and "All other companies with a Dividend in Lag1, Lag 4, Lag7, and/or Lag10 Months" contains companies not in the long portfolio with a dividend in at least one of the months occurring 1,4,7 or 10 months ago. Panel A presents only the intercepts from 4 factor regressions, for the various long and short portfolios as labeled, with 'Difference' being a portfolio long in the predicted dividend portfolio and short the labeled 'short' portfolio. Panel B presents the intercepts for regressions of excess portfolio returns on a CAPM model (excess market returns only), 3 factor regressions (excess market returns, SMB, and HML), 4 factor regressions (excess market returns, SMB, HML and UMD) and 4 factor plus liquidity (excess market returns, SMB, HML UMD and liquidity). To be included in these regressions a company needs a non-missing return from 12 months ago. Regressions are run on monthly returns of NYSE, Amex and NASDAQ common shares, from January, 1927 to December 2009. A dividend is defined as the first two digits of the CRSP DISTCD variable equal to 12 with the third digit less than 6. The top number is the coefficient, the lower number in parentheses is the t-statistic, and *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively.

Panel B - Factor Loadings from Fama French 4 Factor Difference Portfolios

| Long | CAPM Alpha | 3-Factor Alpha | 4-Factor Alpha | 4-Factor + Liq. Alpha | MktRf | SMB | HML | UMD | Liquidity |
|---|---|---|---|---|---|---|---|---|---|
| **Long Predicted Dividend, Short All Other Companies** | | | | | | | | | |
| **Long** | 0.475 *** | 0.360 *** | 0.407 *** | 0.421 *** | 0.911 *** | 0.418 *** | 0.457 *** | -0.066 *** | -0.063 *** |
| | (7.64) | (7.68) | (8.51) | (6.31) | (58.85) | (20.27) | (19.09) | (-4.26) | (-3.30) |
| **Short** | -0.039 | -0.164 *** | -0.128 *** | -0.100 ** | 0.990 *** | 0.684 *** | 0.204 *** | -0.094 *** | -0.040 *** |
| | (-0.55) | (-4.51) | (-3.45) | (-2.36) | (100.26) | (51.87) | (13.33) | (-9.55) | (-3.33) |
| **Difference** | 0.513 *** | 0.523 *** | 0.534 *** | 0.521 *** | -0.080 *** | -0.265 *** | 0.254 *** | 0.029 ** | -0.022 |
| | (10.21) | (12.41) | (12.31) | (9.93) | (-6.53) | (-16.32) | (13.45) | (2.34) | (-1.49) |

| Long | CAPM Alpha | 3-Factor Alpha | 4-Factor Alpha | 4-Factor + Liq. Alpha | MktRf | SMB | HML | UMD | Liquidity |
|---|---|---|---|---|---|---|---|---|---|
| **Long Predicted Dividend, Short All Other Companies With Dividend in the Last Year** | | | | | | | | | |
| **Long** | 0.475 *** | 0.360 *** | 0.407 *** | 0.421 *** | 0.911 *** | 0.418 *** | 0.457 *** | -0.066 *** | -0.063 *** |
| | (7.64) | (7.68) | (8.51) | (6.31) | (58.85) | (20.27) | (19.09) | (-4.26) | (-3.30) |
| **Short** | 0.109 * | 0.002 | 0.030 | -0.023 | 0.916 *** | 0.413 *** | 0.463 *** | -0.071 *** | -0.047 *** |
| | (1.80) | (0.03) | (0.65) | (-0.35) | (60.65) | (20.52) | (19.82) | (-4.70) | (-2.54) |
| **Difference** | 0.362 *** | 0.356 *** | 0.374 *** | 0.444 *** | -0.005 | 0.005 | -0.006 | 0.005 | -0.016 ** |
| | (15.39) | (15.09) | (15.50) | (16.92) | (-0.76) | (0.65) | (-0.60) | (0.83) | (-2.09) |

## Table IV - Daily Abnormal Returns Around Dividend Months

### Panel A - Average Characteristic-Adjusted Returns

| Declaration Day | Predicted Declaration Day | Interim Period | Ex-Day | Declaraction to Ex-Day | 40 Days After Ex-Day |
|---|---|---|---|---|---|
| 0.117 *** | 0.030 *** | 0.158 *** | 0.266 *** | 0.534 *** | -0.732 *** |
| (23.97) | (6.78) | (12.10) | (63.42) | (37.28) | (-32.60) |

### Panel B - Liquidity and Daily Characteristic-Adjusted Returns

| | Length of Interim Period | | | | |
|---|---|---|---|---|---|
| | Declaration Day | Interim Period | Ex-Day | Declaraction to Ex-Day | 40 Days After Ex-Day |
| Constant | 0.107 *** | 0.339 *** | 0.294 *** | 0.730 *** | -0.894 *** |
| | (12.81) | (14.55) | (31.80) | (28.35) | (-20.62) |
| Days in Interim Period (/10) | 0.008 | -0.130 *** | -0.020 *** | -0.142 *** | 0.117 *** |
| | (1.63) | (-6.54) | (-4.57) | (-6.99) | (5.52) |
| $R^2$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| N | 273,366 | 272,975 | 274,573 | 274,573 | 274,584 |
| | Amihud Illiquidity | | | | |
| | Declaration Day | Interim Period | Ex-Day | Declaraction to Ex-Day | 40 Days After Ex-Day |
| Constant | 0.107 *** | 0.179 *** | 0.192 *** | 0.471 *** | -0.585 *** |
| | (16.42) | (6.63) | (26.29) | (15.52) | (-9.40) |
| Amihud Illiquidity Measure | 3.42 | 26.46 *** | 18.08 *** | 43.92 *** | -82.66 *** |
| | (0.57) | (2.91) | (3.99) | (2.96) | (-3.27) |
| $R^2$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| N | 235,908 | 235,765 | 236,974 | 236,974 | 236,931 |

This table examines daily characteristic-adjusted returns in periods around dividend months. Each adjusted return takes the company's stock return and subtracts off the returns of a portfolio matched on quintiles of market capitalization, book-to-market ratio and momentum. A predicted declaration date is 63 trading days after the previous declaration date. Panel A presents the average returns in each period: the declaration day, the interim period (1 day after declaration to 1 day before the ex-day, inclusive), the ex-dividend day, and the 40 days after the ex-dividend day). Panel B takes the same set of returns, regresses them on two measures of liquidity: the number of days in the interim period (divided by 10), and the liquidity measure used in Amihud (2002) : – ——, where *VOLD* is the dollar volume that day, and *D* is the number of days where the stock traded (over the past 250 days) Regressions are run on daily returns of NYSE, Amex and NASDAQ common shares, from January 1927 to December 2009. The top number is the coefficient, the lower number in parentheses is the t-statistic, and *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively.

## Table V - Daily Abnormal Returns, Dividend Yield and Recessions

| | Dividend Yield | | | | |
|---|---|---|---|---|---|
| | Declaration Day | Interim Period | Ex-Day | Declaraction to Ex-Day | 40 Days After Ex-Day |
| Constant | 0.110 *** | -0.202 *** | 0.206 *** | 0.492 *** | -0.269 *** |
| | (10.72) | (-4.74) | (15.85) | (9.71) | (-2.68) |
| Dividend Yield | 0.000 | 0.403 *** | 0.069 *** | 0.031 | -0.542 *** |
| | (0.03) | (10.36) | (4.15) | (0.69) | (-5.57) |
| $R^2$ | 0.000 | 0.001 | 0.000 | 0.000 | 0.001 |
| N | 271,202 | 270,435 | 272,674 | 272,674 | 272,607 |

| | Recessions | | | | |
|---|---|---|---|---|---|
| | Declaration Day | Interim Period | Ex-Day | Declaraction to Ex-Day | 40 Days After Ex-Day |
| Constant | 0.119 *** | 0.140 *** | 0.253 *** | 0.507 *** | -0.689 *** |
| | (21.48) | (8.07) | (37.76) | (26.11) | (-21.00) |
| Recessions | -0.012 | 0.106 *** | 0.078 *** | 0.159 *** | -0.259 *** |
| | (-0.75) | (2.30) | (5.28) | (3.13) | (-2.83) |
| $R^2$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| N | 273,366 | 272,975 | 274,573 | 274,573 | 274,584 |

This table examines daily characteristic-adjusted returns in periods around dividend payment. Each adjusted return takes the company's stock return and subtracts off the returns of a portfolio matched on quintiles of market capitalization, book-to-market ratio and momentum. A predicted declaration date is 63 trading days after the previous declaration date. Regressions are run separately for the declaration day, the interim period (1 day after declaration to 1 day before the ex-day, inclusive), the ex-dividend day, and the 40 days after the ex-dividend day). The independent variable is either the dividend yield (the average from the previous 12 months of dividends payment in months that included a dividend, divided by the share price from the previous month), or a dummy variable that equals one if the economy was in recession at that point. Regressions are run on daily returns of NYSE, Amex and NASDAQ common shares, from January 1927 to December 2009. The top number is the coefficient, the lower number in parentheses is the t-statistic, and *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively.

## Table VI - Abnormal Returns by Dividend Frequency

| Dividend N Months Ago | All | Quarterly | Semi-Annual | Annual | Monthly | Unknown |
|---|---|---|---|---|---|---|
| 1 | -0.060 | -0.066 | 0.086 | -0.125 | 0.264 | 0.086 |
| | (-1.32) | (-1.16) | (0.43) | (-0.40) | (1.51) | (0.52) |
| 2 | 0.201 *** | 0.184 *** | 0.279 | 0.317 | 0.255 | 0.332 ** |
| | (4.58) | (3.61) | (1.41) | (0.91) | (1.36) | (2.13) |
| 3 | 0.554 *** | 0.645 *** | -0.006 | 0.391 | 0.246 | 0.416 *** |
| | (12.75) | (11.23) | (-0.03) | (1.19) | (1.35) | (2.96) |
| 4 | -0.077 * | -0.109 ** | -0.370 * | -0.315 | 0.263 | -0.011 |
| | (-1.77) | (-2.12) | (-1.80) | (-0.95) | (1.48) | (-0.06) |
| 5 | 0.151 *** | 0.127 *** | 0.682 *** | -0.434 | 0.171 | 0.032 |
| | (3.52) | (2.61) | (3.83) | (-1.25) | (0.93) | (0.19) |
| 6 | 0.568 *** | 0.544 *** | 1.146 *** | 0.157 | 0.366 ** | 0.787 *** |
| | (13.85) | (11.52) | (5.63) | (0.52) | (2.01) | (4.18) |
| 7 | -0.098 ** | -0.118 ** | 0.177 | -0.381 | 0.232 | 0.039 |
| | (-2.30) | (-2.44) | (0.80) | (-1.24) | (1.26) | (0.23) |
| 8 | 0.097 ** | 0.068 | 0.277 | -0.711 ** | 0.350 * | 0.526 *** |
| | (2.32) | (1.46) | (1.43) | (-2.16) | (1.83) | (3.22) |
| 9 | 0.507 *** | 0.514 *** | -0.121 | 0.471 | 0.440 ** | 0.248 |
| | (12.66) | (10.90) | (-0.60) | (1.39) | (2.29) | (1.39) |
| 10 | -0.116 *** | -0.163 *** | 0.341 | 0.797 ** | 0.266 | -0.116 |
| | (-2.79) | (-3.28) | (1.54) | (2.46) | (1.41) | (-0.68) |
| 11 | 0.123 *** | 0.105 ** | 0.292 | 0.276 | 0.270 | 0.177 |
| | (2.95) | (2.32) | (1.51) | (0.77) | (1.44) | (0.96) |
| 12 | 0.502 *** | 0.492 *** | 0.816 *** | 0.583 * | 0.489 ** | 0.586 *** |
| | (12.06) | (10.16) | (4.13) | (1.75) | (2.52) | (3.58) |

This table presents the results of Fama French 4 Factor regressions of US monthly stock returns based on the timing of past dividend payments of different frequencies. 'Dividend N Months Ago' means that the portfolio of returns is formed based on companies who paid a dividend of the given type *N* months earlier. Dividend types are from CRSP classifications of the dividend as quarterly, semi-annual, annual, monthly, or unknown, with 'All' including all these categories. Each combination of dividend type and time since the dividend is the output of a separate regression of portfolio returns on a Fama French 4 Factor Model (excess market returns, SMB,HML and UMD portfolios). The dependent variable is the returns of an equal weighted portfolio that is long all companies who paid a dividend of the given type in the given earlier period, and short all companies who did not pay any dividend in that month. Regressions are run on monthly returns of NYSE, Amex and NASDAQ common shares, from January 1927 to December 2009. The top number is the coefficient, the lower number in parentheses is the t-statistic, and *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively.

## Table VII - Double-Sorted Portfolios on Predicted Dividends, Earnings Months and Seasonality

| | Predicted Dividend | Other Past Dividend Payers | Difference |
|---|---|---|---|
| Earnings Month | 0.775 *** | 0.383 ** | 0.392 *** |
| | (4.00) | (2.37) | (2.73) |
| Non-Earnings Month | 0.379 *** | 0.006 | 0.371 *** |
| | (8.03) | (0.13) | (15.25) |
| Difference | 0.563 *** | 0.569 *** | -0.006 |
| | (3.12) | (3.69) | (-0.04) |
| | | | |
| Above Median Heston-Sadka (2008) Seasonality | 0.584 *** | 0.271 *** | 0.320 *** |
| | (10.67) | (5.14) | (10.16) |
| Below Median Heston-Sadka (2008) Seasonality | 0.140 *** | -0.103 ** | 0.247 *** |
| | (2.60) | (-1.96) | (6.39) |
| Difference | 0.444 *** | 0.374 *** | 0.072 |
| | (9.05) | (7.76) | (1.52) |

This table presents the results of Fama French 4 Factor regressions of US monthly stock returns double sorted on predicted dividend payment and other company characteristics. All portfolios are equal-weighted, and monthly stock returns are regressed on monthly excess market returns, SMB, HML and UMD, with the intercept from these regressions being shown. Rows and columns other than 'Difference' show the intercept from four factor regressions that are long in the portfolio indicated in the row or heading. 'Difference' gives the intercept from a four factor regression that is long the portfolio in the top row (or left column) and short the portfolio in the bottom row (or right column). 'Predicted Dividends' is a portfolio of stocks that paid a quarterly or unknown dividend 3, 6, 9 or 12 months ago, a semi-annual dividend 6 or 12 months ago, or an annual dividend 12 months ago. Stocks with monthly dividends in the previous 12 months are excluded from the analysis. For the short portfolios, "Other Past Dividend Payers" contains all companies that paid a dividend in the past 12 months but are not expected to pay a dividend this month under the above definition. Earnings months indicate a month that a company reported earnings. The Heston and Sadka (2008) Seasonality variable is taken as the average return for the stock from 12, 24, 36, 48 and 60 months ago. Each month stocks are sorted according to whether they are above or below the median value for this variable in that month, and split into two portfolios accordingly. Regressions are run on monthly returns of NYSE, Amex and NASDAQ common shares, from January 1927 to December 2009. The top number is the coefficient, the lower number in parentheses is the t-statistic, and *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively.

## Table VIII - Dividend News and Abnormal Returns in Predicted Dividend Months

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **Long** | Predicted Dividend, Dividend Increase in Last year | Predicted Dividend, Constant Dividend in Last year | Predicted Dividend, Dividend Decrease in Last year | Predicted Dividend, Dividend Missed in Last year |
| **Short** | Companies with Dividend Increase in Last Year | Companies with Constant Dividend in Last Year | Companies with Dividend Decrease in Last Year | All Other Companies with Missed Dividend in Last Year |
| **Long** | 0.864 *** | 0.486 *** | 0.397 *** | -0.725 *** |
| | (7.83) | (8.91) | (2.62) | (-3.20) |
| **Short** | 0.427 *** | 0.061 | -0.356 *** | -0.695 *** |
| | (4.85) | (1.12) | (-2.87) | (-4.09) |
| **Difference** | 0.453 *** | 0.403 *** | 0.662 *** | 0.085 |
| | (4.10) | (12.42) | (3.80) | (0.34) |

This table presents the results of Fama French 4 Factor regressions of US monthly stock returns double sorted on predicted dividend payment and recent dividend news. All portfolios are equal-weighted, and monthly stock returns are regressed on monthly excess market returns, SMB, HML and UMD, with the intercept from these regressions being shown. All long portfolios are companies with a predicted dividend in the current month, meaning that the stocks paid a quarterly or unknown dividend 3, 6, 9 or 12 months ago, a semi-annual dividend 6 or 12 months ago, or an annual dividend 12 months ago. In addition, the stocks must also have experienced a dividend increase (column 1), constant dividends (column 2), a dividend decrease (column 3) or dividend omission (column 4) accordingly some time during the past 12 months. The short portfolio is all stocks who had the same dividend news in the past year (increase, constant, decrease or omission) but are not predicted to pay a dividend in the current month. 'Difference' is the difference portfolio of long minus short. Regressions are run on monthly returns of NYSE, Amex and NASDAQ common shares, from January 1927 to December 2009. The top number is the coefficient, the lower number in parentheses is the t-statistic, and *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively.

## Table IX - Long Term Persistance of Dividend Month Premium

| **Long** | Predicted Dividend in Lag Year | Predicted Dividend in Lag Year | **Long** | Predicted Dividend in Lag Year | Predicted Dividend in Lag Year |
|---|---|---|---|---|---|
| **Short** | Other Companies with Dividend in Lag Year | Other Companies with Dividend in Lag Year | **Short** | Other Companies with Dividend in Lag Year | Other Companies with Dividend in Lag Year |
| **Years Lagged** | Equal Weight | Value Weight | **Years Lagged** | Equal Weight | Value Weight |
| 1 | 0.335 *** | 0.253 *** | 11 | 0.131 *** | 0.131 *** |
| | (13.83) | (5.83) | | (5.05) | (2.88) |
| 2 | 0.283 *** | 0.265 *** | 12 | 0.146 *** | 0.106 ** |
| | (10.60) | (5.99) | | (5.82) | (2.28) |
| 3 | 0.285 *** | 0.297 *** | 13 | 0.094 *** | 0.096 ** |
| | (11.16) | (6.69) | | (3.60) | (1.99) |
| 4 | 0.266 *** | 0.273 *** | 14 | 0.133 *** | 0.120 ** |
| | (10.80) | (6.02) | | (4.95) | (2.49) |
| 5 | 0.213 *** | 0.245 *** | 15 | 0.125 *** | 0.107 ** |
| | (8.57) | (5.55) | | (4.45) | (2.16) |
| 6 | 0.185 *** | 0.226 *** | 16 | 0.108 *** | 0.114 ** |
| | (7.51) | (5.27) | | (3.91) | (2.25) |
| 7 | 0.190 *** | 0.236 *** | 17 | 0.112 *** | 0.044 |
| | (7.84) | (5.24) | | (3.94) | (0.84) |
| 8 | 0.155 *** | 0.207 *** | 18 | 0.117 *** | 0.053 |
| | (6.27) | (4.57) | | (3.86) | (0.93) |
| 9 | 0.160 *** | 0.211 *** | 19 | 0.102 *** | 0.041 |
| | (6.42) | (4.72) | | (3.31) | (0.75) |
| 10 | 0.154 *** | 0.173 *** | 20 | 0.105 *** | 0.044 |
| | (6.25) | (3.85) | | (3.33) | (0.78) |

This table presents the results of Fama French 4 Factor regressions of US monthly stock returns sorted on predicted dividend payment at different horizons. Portfolios are equal-weighted or value-weighted as indicated, and monthly stock returns are regressed on monthly excess market returns, SMB, HML and UMD. The intercept from these regressions is shown in the table. The 'predicted dividend' variable selects companies that paid a quarterly or unknown dividend 3, 6, 9 or 12 months ago, a semi-annual dividend 6 or 12 months ago, or an annual dividend 12 months ago. This variable is then lagged in years by adding multiples of 12 months to each of the date requirements – e.g. a lag of one year means a stock that paid a quarterly dividend 15, 18, 21 or 24 months ago (and equivalently for semi-annual and annual), a lag of two years means quarterly dividend payment 27, 30, 33 or 36 months ago, etc. The long portfolio is all stocks with a predicted dividend lagged by that number of years, while the short portfolio includes all companies that paid a dividend in the 12 months of the lagged year that aren't predicted to pay a dividend (e.g. a lag of 1 year means any dividend payment from 13 to 24 months ago that isn't predicted to pay a dividend this month). Regressions are run on monthly returns of NYSE, Amex and NASDAQ common shares, from January 1927 to December 2009. The top number is the coefficient, the lower number in parentheses is the t-statistic, and *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively.

## Table X - Calendar, Seasonality and Subperiods

### Panel A - Dividend Month Premium by Calendar Month

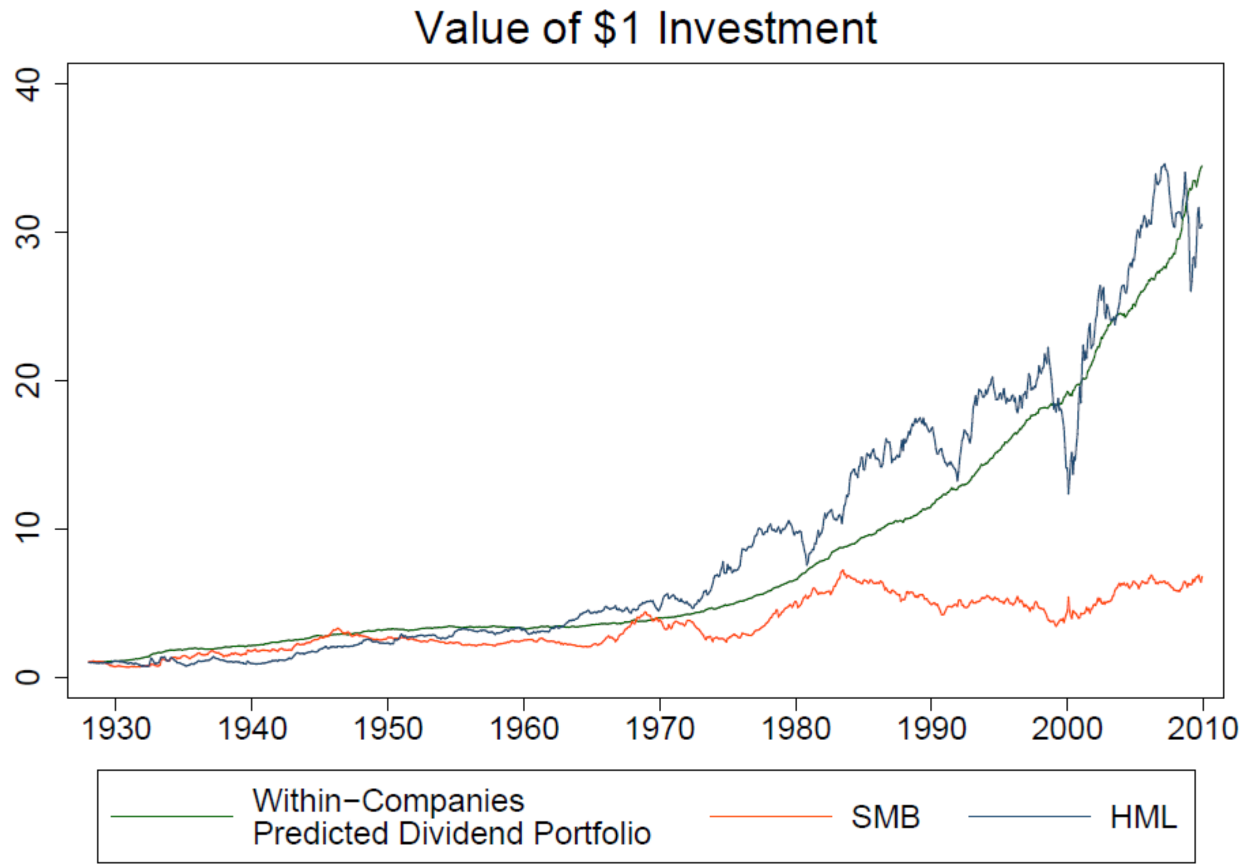
| **Month** | EW, Predicted Dividend - All Other Past Dividend Payers | **Month** | EW, Predicted Dividend - All Other Past Dividend Payers |
|---|---|---|---|
| January | 0.365 * | July | 0.766 *** |
| | (1.85) | | (4.61) |
| February | 0.551 *** | August | 0.567 *** |
| | (3.61) | | (4.92) |
| March | 0.642 *** | September | 0.431 *** |
| | (5.41) | | (2.90) |
| April | 0.337 ** | October | 0.274 * |
| | (2.39) | | (1.87) |
| May | 0.525 *** | November | 0.552 *** |
| | (4.47) | | (3.98) |
| June | 0.562 *** | December | 0.615 *** |
| | (3.97) | | (3.21) |

### Panel B - Different Sub-Periods

| **Period** | Equal Weighted | Value Weighted |
|---|---|---|
| 1926-1945 | 0.790 *** | 0.520 *** |
| | (6.37) | (4.23) |
| 1946-1965 | 0.214 *** | 0.045 |
| | (4.92) | (0.53) |
| 1966-1985 | 0.604 *** | 0.468 *** |
| | (11.29) | (5.69) |
| 1985-2009 | 0.471 *** | 0.288 *** |
| | (7.15) | (3.75) |

This table presents the results of Fama French 4 Factor regressions of US monthly stock returns sorted on predicted dividend payment in different calendar months, and in different sub-periods. Monthly stock returns are regressed on monthly excess market returns, SMB, HML and UMD, with the intercept from these regressions being shown. Predicted dividends refers to stocks that paid a quarterly or unknown dividend 3, 6, 9 or 12 months ago, a semi-annual dividend 6 or 12 months ago, or an annual dividend 12 months ago. 'All Other Past Dividend Payers' is all companies who paid a dividend in the past 12 months but are not predicted to pay a dividend this month based on the above formula. The dividend month premium is the abnormal returns to the difference portfolio long predicted dividend payers and short all other past dividend payers. Panel A examines the equal-weighted dividend month premium in different calendar months of the year. Panel B examines the dividend month premium in different sub-periods: 1926-1945, 1946-1965, 1966-1985 and 1986-2009. The top number is the coefficient, the lower number in parentheses is the t-statistic, and *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively.

Figure 1 – Cumulative Value of the Dividend Month Premium Compared With Size and Book-to-Market Anomalies




This figure presents the cumulative value for the dividend month premium portfolio compared with the size (SMB) and book-to-market (HML) portfolios. In each case, the cumulative value of an initial one dollar investment on December 31, 1927 is plotted on the y-axis, versus the year on the x-axis. The green line is for the 'within-companies' dividend month premium – a portfolio that is long in all companies predicted to pay a dividend this month, and is short in all companies who paid a dividend in the past 12 months but that are not predicted to pay a dividend this month. The orange line is the cumulative value of the SMB portfolio and the blue line is the cumulative value of the HML portfolio, both taken from Ken French's website.

Figure 2 –Daily Characteristic-Adjusted Returns Around Ex-Dividend Date

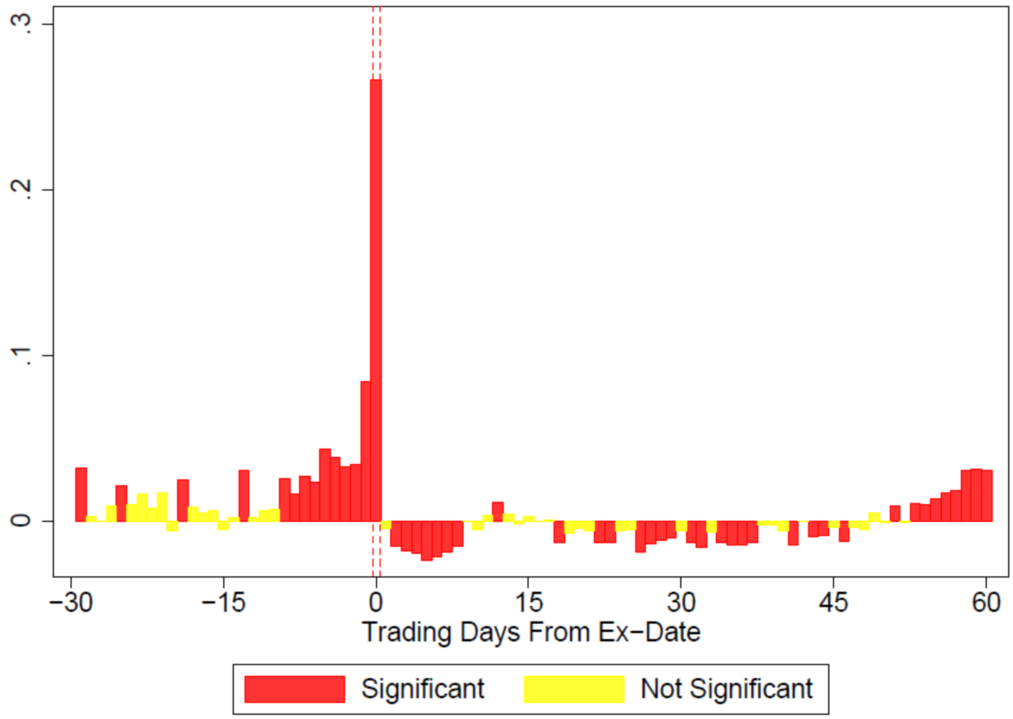
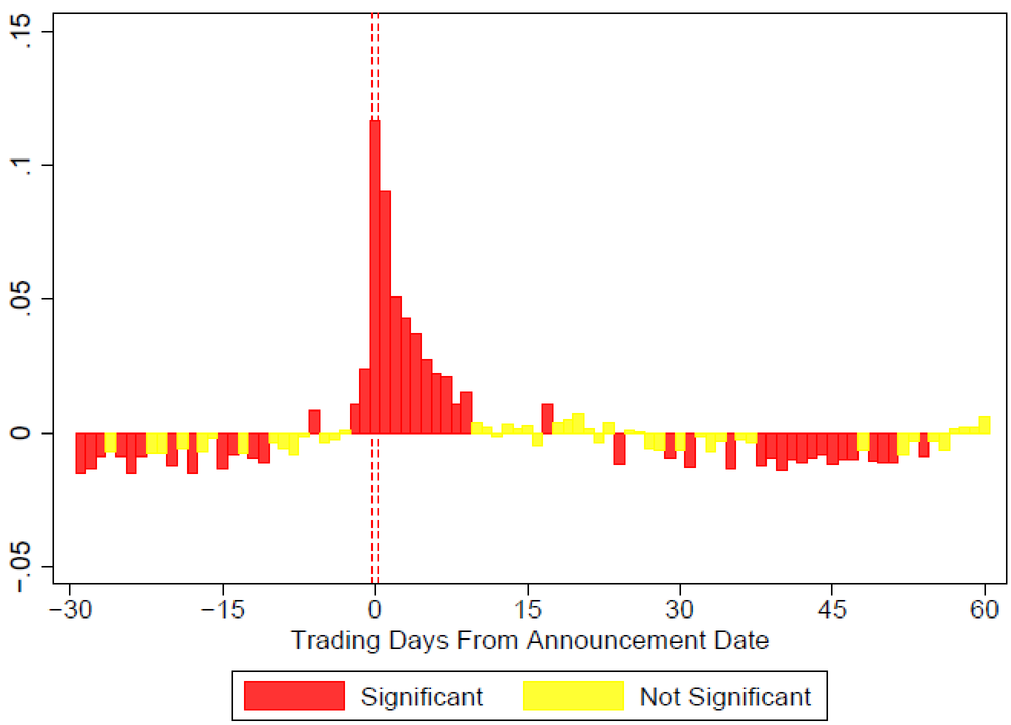



Figure 2 –Daily Characteristic-Adjusted Returns Around Announcement Date




These figures present daily characteristic-adjusted stock returns around ex-dividend dates (Figure 2) and dividend announcement dates (Figure 3). Each adjusted return takes the company's stock return and subtracts off the returns of a portfolio matched on quintiles of market capitalization, book-to-market ratio and momentum. Adjusted returns are taken relative to the ex-dividend date, with negative dates being before the ex-dividend (announcement) date and positive dates being afterwards. All returns are in percent (e.g. '0. 1' corresponds to 10 basis points). Lines in red have a t-statistic that is significant at the 5% level, and lines in yellow are not significant at a 5% level

Figure 4 – Abnormal Volume Around Ex-Dividend Date

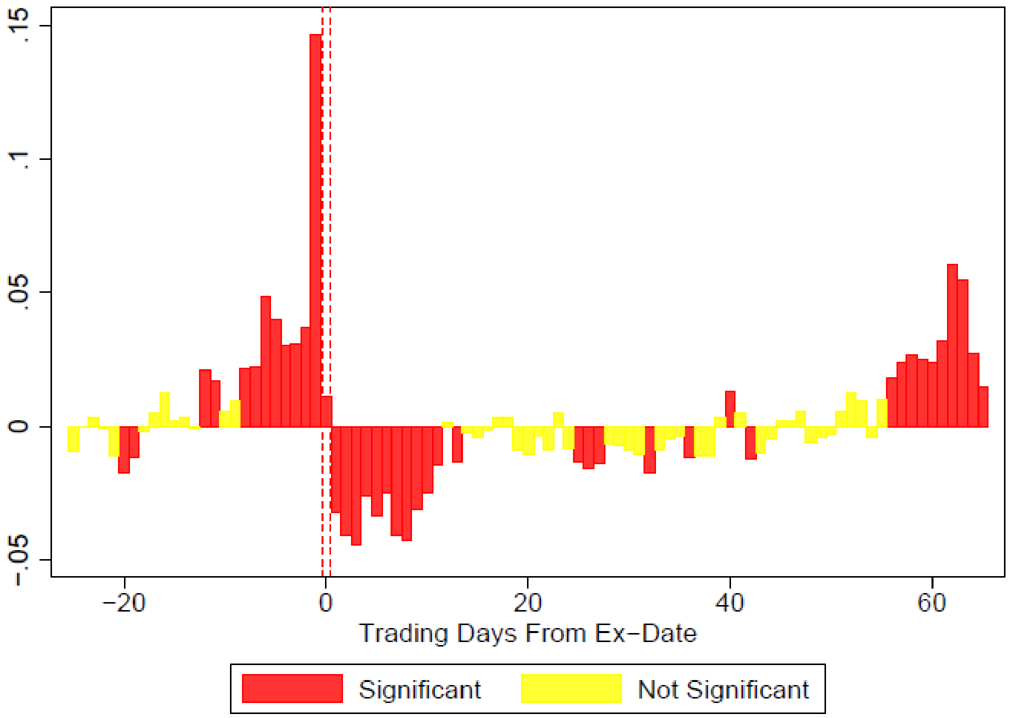
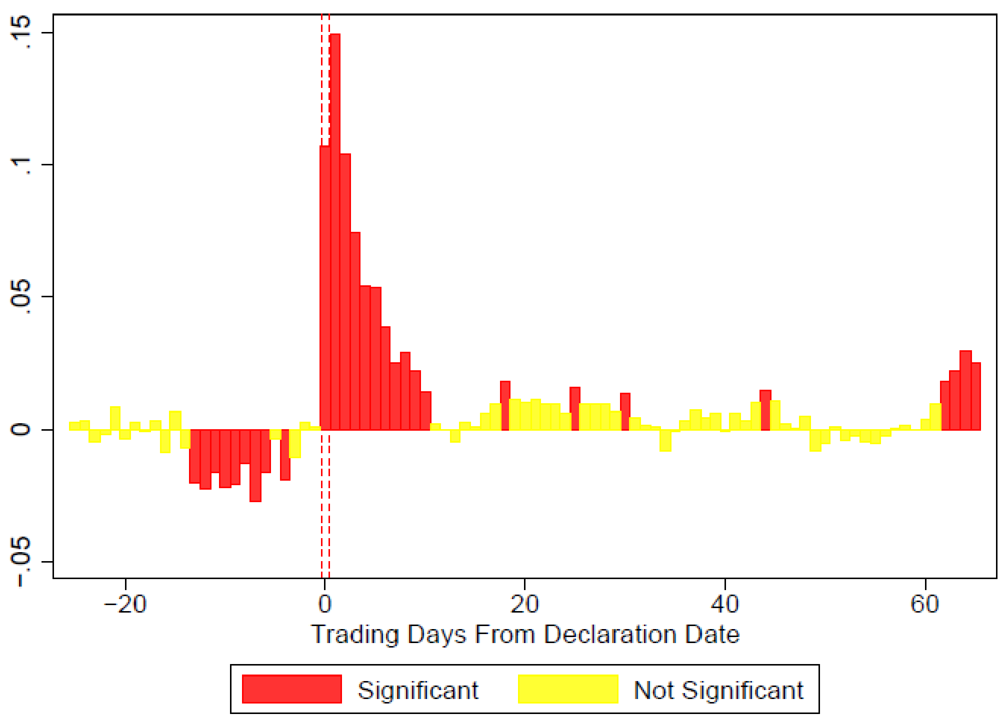


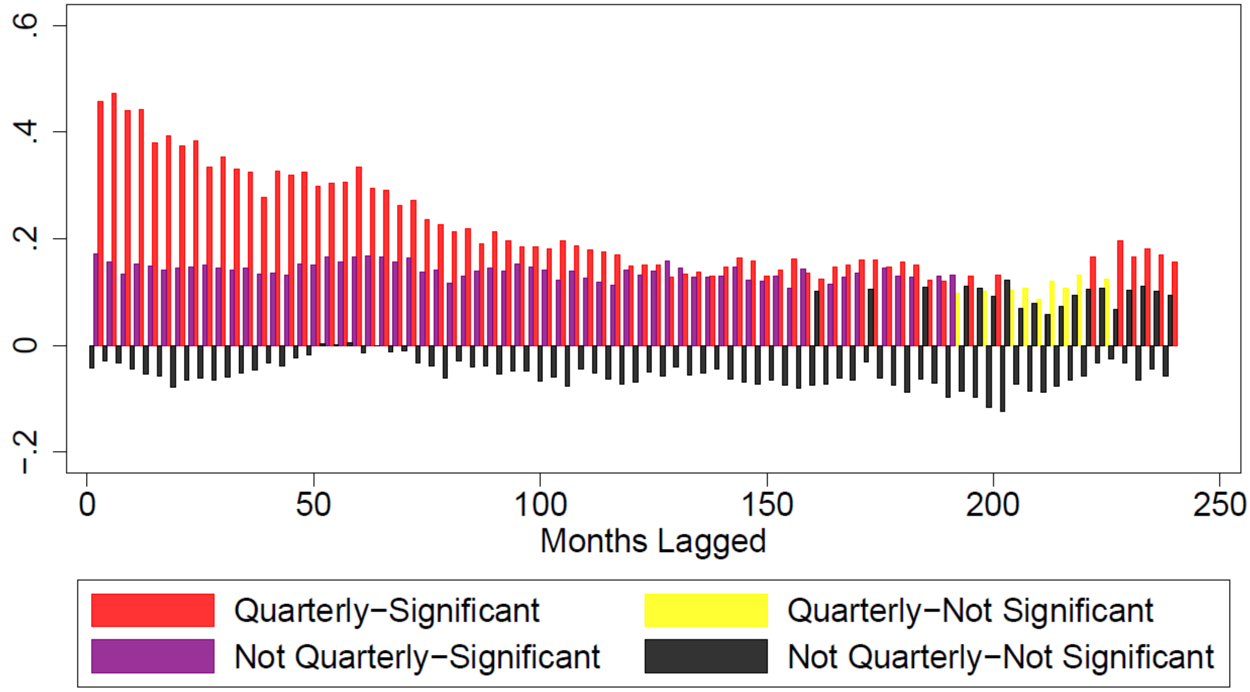

Figure 5 – Abnormal Volume Around Announcement Date




These figures present the abnormal trading volume around ex-dividend dates (Figure 4) and dividend declaration dates (Figure 5). Abnormal Volume is computed each day as (Volume – 250 Day Average Volume)/ 250 Day Average Volume. This is computed daily for each company, and averaged for each day relative to the ex-dividend date (declaration date), with negative dates being before the ex-dividend date (declaration date) and positive dates being afterwards. All returns are in decimals (e.g. '0.1' corresponds to 10 per cent). Lines in red have a t-statistic that is significant at the 5% level, and lines in yellow are not significant at a 5% level

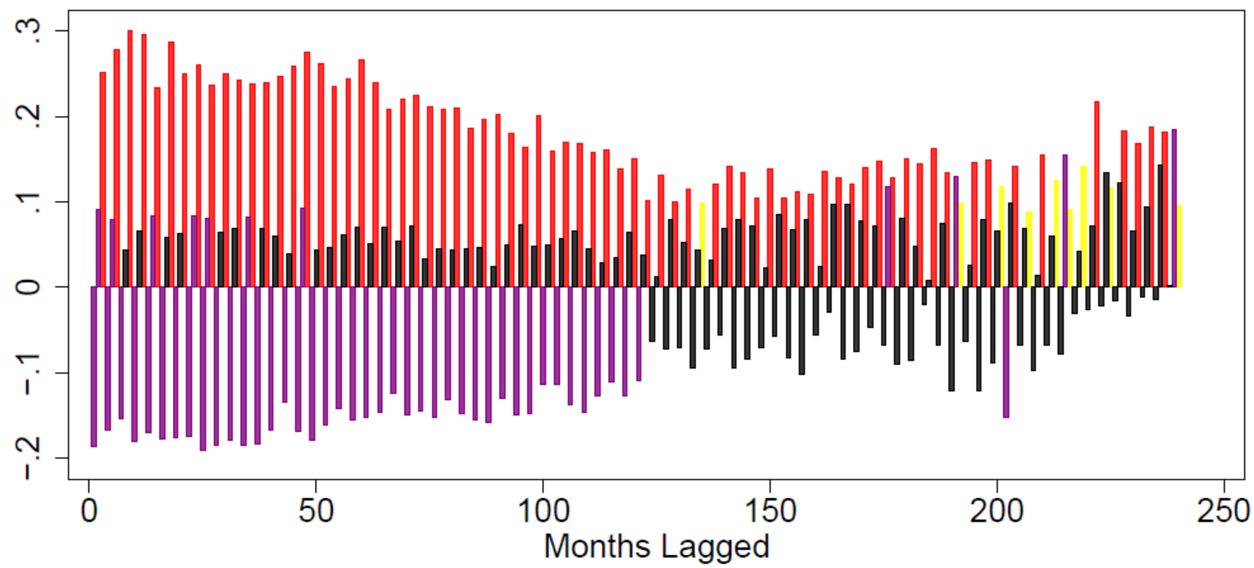
Figure 6 – Abnormal Returns for Portfolios of Past Dividend Payers

Panel A – Equal Weighted




Quarterly means the month lag is a multiple of 3.

Panel B – Value Weighted




This figure presents the intercepts from four-factor regressions of monthly stock returns for companies that paid a dividend in previous months. Each point is from a separate regression of a portfolio of monthly stock returns on excess market returns, as well as SMB, HML and UMD portfolios. The y-axis is monthly abnormal returns, in percent. In Panel A, the results are for equal-weighted portfolios, and in Panel B they are for value-weighted portfolios. Portfolios are formed for all companies that paid a dividend of any kind in the number of months prior indicated. When the month is a multiple of three (i.e. paid a dividend 3 months ago, 6 months ago etc.), the bar is red if the intercept has a t-statistic that is significant at the 5% level, and yellow if the intercept is not significant at the 5% level. When the month is not a multiple of three, the bar is purple if the intercept has a t-statistic that is significant at the 5% level, and black if the intercept is not significant at the 5% level.