Being Surprised by the Unsurprising:

Earnings Seasonality and Stock Returns

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Abstract: We present evidence consistent with markets failing to properly price information contained in seasonal earnings patterns. Firms whose earnings are historically larger in a given quarter each year ("high seasonality months") experience higher stock returns for predicted earnings announcements that month. Analyst forecast errors are also more positive in high seasonality months, consistent with the returns being driven by mistaken estimates of earnings rather than just announcement risk. Earnings seasonality returns appear to be related to the tendency of investors to overweight the recent lower earnings that follow a highly seasonal quarter, leading to pessimistic forecasts when the high seasonal quarter arrives again. The effect is not explained by firm-specific information, increases in trading volume, greater earnings management, or calendar effects.

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1. Introduction

A fair reading of the voluminous literature on market efficiency would seem to support the conclusion that markets are neither wholly efficient (that is, correctly pricing absolutely every piece of information) nor wholly inefficient (pricing nothing at all).[1] A natural question arises then as to *what sorts of information* investors are relatively good at incorporating into prices. One can contrast two possible views on this point. A standard information acquisition view would posit that investors should do better with signals that are easy to acquire and process – information that is easy to interpret, and that is repeated frequently for each firm in a timely manner, thus allowing ample opportunities for learning. A more behavioral view, however, would emphasize that investors are more likely to pay attention to information that is more salient – focal events that attract investor attention. Under an investor inattention view, repeated and well-understood events may be *less* likely to priced, as they are less likely to be focused on.

We examine this question in the context of the information contained in earnings seasonality. The fact that ice cream producers typically generate more earnings in summer and snow-blower shops typically generate more earnings in winter would strike most people as obvious to the point of being trite. Earnings seasonality is thus a strong candidate for information whose very obviousness means that it should be easy to process, but which may not be salient and attention-grabbing.

In this paper we present evidence consistent with markets failing to properly price information contained in seasonal patterns of earnings. We find that companies earn significant abnormal returns in months that historically contain a larger share of annual earnings than other

[1] For a recent examination of the long list of current anomalies, see for instance Pontiff and McLean (2013)

months in the year. Consider the example of Borders Books, which traded from 1995 to 2010. Borders books had a highly seasonal business, with a large fraction of earnings happening in the 4th quarter, partly as a result of Christmas sales. Out of Borders 63 quarterly earnings announcements, the 14 largest were all 4th quarter earnings. Not only did these quarters have high levels of earnings, but they also had high earnings announcement returns – the average monthly market-adjusted return for Borders' 4th quarter announcements was 2.27%, compared with -3.40% for all other quarters. We show that this pattern not only holds for seasonal firms in general, but is also predictable in advance – high earnings announcement returns can be forecast using past information about seasonal patterns in earnings.

To capture earnings seasonality, we focus on firms whose earnings are reliably higher in one quarter relative to other quarters in the year. We rank a company's quarterly earnings announcements over a five year period beginning one year before portfolio formation, and calculate the average rank of the upcoming quarter in the previous five years. The highest possible seasonality in quarter 3, for instance, would be a company where the previous 5 announcements in quarter 3 were the largest out of the 20 announcements considered.

A portfolio of companies with expected earnings announcements in the highest quintile of earnings seasonality earns abnormal returns of 63 basis points per month, compared with abnormal returns of 29 basis points per month for the lowest seasonality quintile. This difference is statistically significant at the 1% level, and unlike many anomalies it becomes stronger when the portfolio is value-weighted (abnormal returns of 50 basis points for the difference portfolio, with a *t*-statistic of 2.98). As the base returns in expected earnings announcement months are generally positive due to the earnings announcement premium (Frazzini and Lamont (2006)), another way of interpreting the main finding is that the earnings announcement premium is larger in months when earnings are also expected to be larger.

The nature of the earnings seasonality measure makes it unlikely that these returns are driven by seasonal firms having different fixed loadings on risk factors. Because seasonality is constructed based on the time series of each firm's earnings, when earnings are higher than average in one month they must be lower than average in other months of the year. As a result, firms tend to cycle through both the long and short sides of the portfolio. To emphasize this point, we redo the analysis limiting the sample to firms that are both in quintile 1 and quintile 5 at some point in the same year (ensuring the variation is only time-series variation with each firm) and the results are very similar. In order for a risk story to explain the results, it must be the case that firms are more risky in months of high seasonality than other months.

The possibility that risk is higher in months when a larger amount of total earnings are announced is not unreasonable. Such an explanation would be consistent with Savor and Wilson (2011), who argue that the earnings announcement premium is driven by announcement risk. It is worth noting, that the risk cannot simply be exposure to the market, as the four-factor regressions will already control for this. The portfolio of highly seasonal firms also does not show higher volatility than the portfolio of low seasonal firms, although this does not rule out the possibility of exposure to other sources of systematic risk.

There is however one area where the explanations of announcement risk versus investor mistakes make clearly divergent predictions: analyst forecast errors. Because announcement risk is a discount rate channel, if this were the only driver of returns then there should not be evidence of greater mistakes in estimates of cash flows. Instead, we find that analyst forecast errors are also more positive in high seasonality months. To the extent that individual investors are either making the same mistakes as analysts, or alternatively that they simply take analysts' mistaken forecasts at face value, then the portfolio returns are consistent with mispricing rather than risk.

We conjecture that the effects of seasonality are a result of investors incorrectly processing patterns in data when forming estimates of future earnings. If an upcoming quarter has high seasonality, this implies that level of earnings in the three most recent announcements was likely to be lower than the announcement four quarters ago. If investors suffer from the recency bias (Murdock Jr (1962), Davelaar et al. (2005)), they may be more likely to overweight recent lower earnings compared to the higher earnings from the same quarter last year. This would cause them to be overly pessimistic about the upcoming announcement, leading to greater positive surprises. The recency bias is an example of the more behavioral view of learning, where older information is less salient even though it is not necessarily more difficult to acquire or process.

Consistent with a recency bias, we find that the seasonality effect is larger when earnings in the three most recent announcements (typically 3, 6 and 9 months before portfolio formation) were lower relative to earnings 12 months ago. This suggests that when the recent news has been of a larger decrease in earnings relative to the high seasonal quarter, investors are more pessimistic when the high seasonal quarter arrives. On the other hand, if there are lower earnings *before* the seasonal quarter 12 months ago (typically 15, 18 and 21 months before portfolio formation), this does not generate any spread in returns. This suggests that the recency of low earnings is important in generating underreaction to seasonality. The seasonality effect is also not present when the firm has broken an earnings record in the past 12 months, an event which is also likely to make the prospect of continuing good news salient to investors.

The pattern in earnings seasonality does not appear to be driven by other variables that have been associated with the earnings announcement premium. Frazzini and Lamont (2006) argue that the increase in turnover in earnings months is driving the earnings announcement premium, potentially because this is associated with an increase in investor attention. While high seasonal months have more turnover than low seasonal months, there is no relationship between the increase in turnover in seasonal months and the returns in those months, suggesting that the volume increase does not drive the effect. The seasonality effect does not appear to be driven by a tendency of firms to engage in more earnings management in highly seasonal quarters. It is not related to worse firm governance (Gompers, Ishii and Metrick (2003)) or the tendency to beat analysts' forecasts by a penny or less (Cohen, Malloy and Lou (2013)), and the effect is weaker, not stronger, for firms with higher accruals (Sloan (1996)).

We conduct a number of tests to show that seasonality is not simply proxying for some other driver of returns. It is not explained by other known time-series effects within the firm, including overall return seasonality (Heston and Sadka (2008)), momentum, short-term reversals, or the dividend month premium. Earnings seasonality is not some general driver of returns, as it does not show any relationship with returns outside of earnings months. Seasonality is also unlikely to be proxying for some recent information about the firm, however arising. Seasonality is highly persistent across years, thus lagging the seasonality measure by five years produces similar results, and the effect is still weakly present even when the seasonality measure is lagged ten years. Earnings seasonality returns are stronger in the first quarter of the year, but are directionally positive in all four quarters of the year. Seasonality predicts returns both within and between industries, and is robust to alternative measures of how seasonal a quarter is.

Overall, our results are consistent with investors underreacting to the information in earnings seasonality. Information about seasonality is repeated frequently and is easy to understand and forecast, but it is slow-moving and not very salient. It is, in other words, a classic ‘dog bites man’ type of story. Our findings are consistent with the possibility that information may be sometimes incorrectly priced not *despite* the fact that it is obvious, but rather *because* it is obvious.

The remainder of the paper is as follows: section 2 reviews the literature, section 3 describes the data and the main results about seasonality and earnings announcement returns, section 4 explores potential explanations for the effect, and section 5 concludes.

2. Literature Review

This paper contributes to several literatures in finance. Firstly, it is related to a number of papers that document high returns during recurring and predictable time-series changes within the firm, including months with an expected earnings announcement (Beaver (1968), Frazzini and Lamont (2006), Savor and Wilson (2011)), an expected dividend (Hartzmark and Solomon (2013)), and high returns at increments of 12 months (Heston and Sadka (2008)). In addition, there are a number of other one-off changes in firm prices and volumes that drive returns, including one month returns (Jegadeesh (1990)), 2 to 12 month returns (Jegadeesh and Titman (1993)), 3 to 5 year returns (DeBondt and Thaler (1985), and recent spikes in volume (Gervais, Kaniel and Mingelgrin (2002)). We contribute to this literature by identifying a new anomaly based on repeated and predictable variation in earnings levels.

Second, this paper is related to the literature in accounting examining how market participants form estimates of firm earnings. A number of papers have explored how markets appear to underreact to earnings news, as evidenced by the post-earnings announcement drift (Ball and Brown (1968), Bernard and Thomas (1990), among many others). Prices also do not appear to properly account for the different persistence of accruals (roughly speaking earnings that do not also have equivalent cash flows in the same year), leading to predictability in future returns (Sloan (1996)). In addition, analyst forecasts of earnings tend to be positively biased, which has been linked to both incentives for analysts to please firms and genuine excessive optimism by analysts (Michaely and Womack (2005)). Our paper contributes to this literature by identifying a new form of investor mistake regarding seasonal patterns in earnings, which we relate to the tendency to overweight recent information.

3. Results

3.1 Data

The data for earnings come from Compustat Quarterly File. The data on stock prices come from the Center for Research in Securities Prices (CRSP) monthly stock file. Unless otherwise noted, in our return tests we consider stocks listed on the NYSE, AMEX or NASDAQ exchanges, consider only common stock (CRSP share codes 10 or 11). We also exclude stocks that have a price less than $5 at the start of the month over which returns are being measured. The data on analyst forecasts come from the I/B/E/S detail file, and we consider forecasts of quarterly earnings per share. Data on the excess market return, risk-free rate, SMB, HML and UMD portfolios come from Ken French's website.

3.2 Constructing measures of seasonality

To captures the level of earnings seasonality, we wish to measure the extent to which earnings in a given quarter tend to be generally higher than other quarters. Conceptually, this includes both a question of *how often* earnings are larger in a given quarter, and *by how much* they are higher on average in a given quarter. The main measure we construct prioritizes the first component, counting companies as seasonal if they regularly have high in earnings in a given quarter, although later in the paper we also examine the size of the gap in earnings across quarters. In addition, the ideal measure of seasonality will not be spuriously affected by other patterns earnings, such as overall volatility or overall trends in earnings growth.

To construct our main measure of predicted seasonality in quarter *t*, we use 5 years of earnings data from quarter *t*-23 to *t*-4. We compute firm earnings per share (excluding extraordinary items) adjusted for stock splits.[2] We then rank the 20 quarters of earnings data from largest to smallest. We require non-missing values for all 20 quarters of earnings in order to capture the measure. The main measure, *EarnRank*, for quarter *t* is taken as the average rank of quarters *t*-4, *t*-8, *t*-12, *t*-16, *t*-20 – in other words, the average rank of same fiscal quarter taken from previous years. A high value of *EarnRank* means that historically the current quarter of the year has larger earnings than other quarters, while a low rank of *EarnRank* means that the current quarter is low relative to other quarters. A firm whose earnings are randomly distributed will tend to be in the middle of the distribution of *EarnRank.*

While there are other ways to measure seasonality, the current variable has several advantages. Firstly, *EarnRank* is not affected by the existence of negative earnings in some

[2] The main results of the paper are very similar if other measures of earnings are used, such as total earnings, raw earnings per share, earnings per share divided by assets per share, or earnings per share divided by share price.

periods, unlike measures that involve percentage changes in earnings. Second, it is relatively invariant to the existence of large outliers in earnings numbers, such as from a single very bad quarter. Third, by comparing a single rank using quarters from several years, *EarnRank* is less sensitive to trends in overall earnings growth. If each quarter were only ranked relative to other quarters that year, then companies with uniformly growing earnings would appear to have the maximum possible seasonality in the 4th quarter, as this was always higher than quarters 1 through 3. By contrast, under the current measure, the rankings of the 4th quarters would be 4, 8, 12, 16 and 20, giving an average rank of 12. This is considerably less than the maximum rank of 18, and empirically only 0.35 standard deviations above the median value (11) and 0.45 standard deviations above the mean (10.85). In Table I Panel A, we present summary statistics for the main variables used in the paper.

3.3 Seasonality and the Earnings Announcement Premium

We first examine the main question of the paper – whether information about earnings seasonality is incorporated into estimates of firm earnings. To do this, we examine stock returns in months when firms are predicted to have an earnings announcement and sort based on the historical level of seasonality in earnings that quarter. If the market has not fully incorporated the fact that earnings tend to be higher in certain quarters, then the revelation of actual earnings will result in price movements. By contrast, if markets are correctly forecasting the effect of seasonality, then the higher earnings in a given quarter will not result in different stock returns.

As in Frazzini and Lamont (2006), we do not wish to condition ex-post on the existence of an earnings announcement. This is because the ultimate timing of an announcement may convey information, such as if firms delay earnings announcements in the event of bad news.

Instead, we condition on whether a firm was predicted to have an earnings announcement in the current month, based on whether or not it had an earnings announcement 12 months ago. The portfolio of all stocks predicted to have an earnings announcement tends to have abnormally positive returns, which is the earnings announcement premium documented in Frazzini and Lamont (2006).

To examine the effects of earnings seasonality, we first condition on the existence of an earnings announcement 12 months ago, and then sort based on the level of *EarnRank*, using earnings data from 20 quarters ending in the announcement 12 months. *EarnRank* is thus the prediction of whether earnings in the current month were historically higher than average. To test the effect of earnings seasonality, we sort all firms into quintiles according to their level of seasonality in that month and form portfolios of returns for each quintile. In this setting, quintile 5 is a portfolio formed from all firm/month observations where the *EarnRank* variable was in the top 20% of the sample that month: that is, earnings in that quarter were historically larger than other months. Similarly, quintile 1 is the portfolio of firms with smaller than average earnings that month. We only include months where the portfolio has at least 10 firms, and in the case of the difference portfolio, where both the long and short leg have at least 10 firms. It is worth emphasizing that due to the earnings announcement premium all of the quintiles of *EarnRank* are predicted to have positive abnormal returns. The main question of interest is whether seasonality causes the returns in some cases to be larger than others.

We consider this question in Table I Panel B. For the equal-weighted case, the highest seasonality quintile earns returns of 172 basis points per months, compared with 144 basis points per month for the lowest seasonality quintile. The gap is larger when value-weighted portfolios are formed, with the high seasonality quintile having returns of 168 basis points per month, compared with 133 basis points per month for the lowest seasonality quintile.

In addition, the high seasonality portfolio does not appear to have more volatility. The low seasonality portfolio actually has a slightly higher standard deviation of monthly portfolio returns (5.29 equal weighted, 5.13 value weighted) than the high seasonality portfolio (5.10 equal weighted, 5.03 value weighted). This militates against some simple risk-based explanations of the difference in portfolio returns, inasmuch as the higher returns to the high seasonality portfolio do not expose the investor to greater volatility. The various snapshots of percentiles from the return distribution do not indicate that the high seasonality portfolio is more exposed to extreme negative returns, such as the crash risk associated with momentum (Daniel and Moskowitz (2012)). The lowest monthly return is -14.1% for the equal-weighted difference portfolio, and -15.2% for the value-weighted difference portfolio (compared with maximums of 10.8% and 16.4% respectively).

Of course, risk is not simply measured by volatility and skewness. It may be possible that high seasonality firm/months are exposed to other sources of economy-wide risks that investors care about. We turn to this question in Table II. We examine the abnormal returns to earnings announcement premium portfolios sorted on earnings seasonality, relative to a four factor model controlling for excess market returns, size, and book-to-market (Fama and French (1993)) and momentum (Carhart (1997)). The returns of the earnings seasonality quintile portfolios are regressed on the excess returns of the market, as well as the SMB, HML and UMD portfolios from Ken French's website.

The results are presented in Table II. Panel A examines the returns to portfolios formed on earnings rank described previously. The results indicate that the patterns in abnormal returns documented previously are not explained by different exposure to standard factors. For equal weighted portfolios, the lowest seasonality quintile has a four factor alpha of 29.1 basis points per month (with a *t*-statistic of 3.14), while the highest seasonality quintile portfolio has an alpha of 63.2 basis points per month (with a *t*-statistic of 7.20). The long-short difference portfolio has abnormal returns of 34.2 basis points per month, with a *t*-statistic of 3.17. As in Table I, the effects are stronger when value weighted portfolios are used. The low seasonality portfolio has abnormal returns of 33.9 basis points (with a *t*-statistic of 2.67), while the high seasonality portfolio has abnormal returns of 83.5 basis points per month (with *t*-statistic of 6.01). The difference portfolio has abnormal returns of 49.6 basis points per month, with a *t*-statistic of 2.98.

It is worth noting that the largest distinction is between the highest seasonality quintile and the remainder, with quintiles 1-4 showing similar abnormal returns to each other. The effect is thus driven by the long side of the portfolio. This is unusual among anomalies, where a number of effects are concentrated in the short side (Stambaugh, Yu and Yuan (2012)). The fact that the majority of the anomaly comes from the firms with historically high earnings in the current quarter is something we will return to when examining the possibility of investors being pessimistic about the upcoming high seasonality quarter due to a recency bias.

Secondly, the difference portfolios in Panel A have relatively low loadings on most of the standard factors, having small and statistically insignificant loadings on excess market returns, and UMD, and moderately but negative loadings on SMB and HML (meaning that the portfolio tilts towards somewhat towards large growth firms). This is because firms that have some kind of seasonal pattern in earnings tend to cycle between the two extreme portfolios. In other words, if a firm has unusually high earnings in the March quarter, it is more likely that it will have unusually low earnings in some other quarter (relative to a firm with smooth earnings).

To emphasize this point, in Panel B we form portfolios of firms in the extreme quintiles (1 and 5) which were also in the opposite extreme portfolio within 12 months. In other words, firms are included in the highest quintile of seasonality from 12 months ago (quintile 5) only if they are also in the *lowest* quintile of seasonality either in the three quarters before (e.g. 15, 18 or 21 months ago) or three quarters after (e.g. 9, 6, or 3 months ago). This ensures that any variation in seasonality is only coming from variation within the firm, rather than picking up cross-sectional variation from the types of firms that tend to have high seasonality at some point in time. Because the long and short portfolios cycle through the same set of firms, any fixed loadings on factors will tend to cancel out over time, and only exposure to time-varying factors will remain.

The results are shown in Table II Panel B. The abnormal returns are similar to those in Panel A – the equal-weighted difference portfolio has abnormal returns of 41.6 basis points (*t*-statistic of 3.44) while the value-weighted difference portfolio has abnormal returns of 45.1 basis points (*t*-statistic of 2.28). In addition, the loadings on the factors are small and generally insignificant – the equal-weighted portfolio has no significant loadings on any factors, while the value-weighted portfolio has a slightly negative loading on the excess market return but no significant loadings on other factors. This result suggests that not only are the abnormal returns not driven by loadings on the market, SMB, HML or UMD, but they are also not likely to be driven by fixed loadings on other omitted factors that are not examined here. The results are only likely to be driven by time-varying risk loadings, where firms become riskier in high seasonality months relative to low seasonality months.

3.4 Effect of Earnings Seasonality versus other Seasonal Variables

While the previous tables document the existence of abnormal returns relative to a four-factor model, it is possible that the seasonality effect is simply picking up other known anomalies that also involve within-firm variation in returns. We are particularly concerned with factors that involve predictable changes in the firm over time. These include the dividend month premium (Hartzmark and Solomon (2013)), where firms have abnormally high returns in months when they are predicted to pay a dividend, and return seasonality (Heston and Sadka (2008)), where returns 12, 24, 36, 48 and 60 months ago positively predict returns in the current month. We also examine the effect of other variables known to effect returns – log market capitalization, log book-to-market ratio, momentum (returns from 12 months ago to 2 months ago) and last month's return.

In addition, we wish to examine whether the effect of earnings seasonality is limited to months with a predicted earnings announcement. If high seasonality is associated with a general period of increased risk that is not specifically related to earnings, then the higher returns may be evident in other months surrounding the high seasonality period. One test of this hypothesis is whether the high returns are evident in months when the firm is not predicted to announce earnings. If the returns are driven by exposure to economy-wide risk factors in a way unrelated to earnings specifically, then one might expect the high returns to be evident in all months, not just earnings months.

We test these possibilities in Table III by examining the effect of earnings seasonality using Fama Macbeth cross-sectional regressions – in each month, we run a cross-sectional regression of stock returns on stock characteristics, then the time-series average and *t*-statistic associated with each of the regression coefficients is computed. We consider two versions of the regression. In columns 1-4, we consider only the cross-section of firms that had an earnings announcement 12 months ago, and thus are predicted to have an earnings announcement in the current month. The *EarnRank* variable shows a strong predictive ability in a univariate specification, with a coefficient of 0.038 and a *t*-statistic of 3.21. Since the standard deviation of seasonality is 2.85, this means that a one standard deviation in seasonality corresponds to an increase in returns during earnings months of 10.6 basis points. When additional controls are included in column 2 for predicted dividends, Heston and Sadka (2008) seasonality, log market cap, log book-to-market, momentum and one-month reversal, the coefficient is similar, at 0.037 with a *t*-statistic of 3.29. The results are similar in columns 3 and 4 when the percentile value of *EarnRank* is used instead of the raw value.

In columns 4-8 we consider the cross-section of all firms, and include a dummy variable for predicted earnings that we interact with the measure of seasonality. In this specification, seasonality is matched to the predicted earnings month (i.e. 12 months after the measure is formed) and the subsequent two months (13 and 14 months afterwards, respectively). Column 5 is the all-firm equivalent of the univariate regression, including only seasonality, a dummy for predicted earnings, and the interaction between the two. The regression shows that only the interaction of predicted earnings and seasonality shows a significant positive effect, with a coefficient of 0.051 and a *t*-statistic of 3.83. Earnings seasonality has a weakly negative effect in non-earnings months, although the coefficient is only marginally significant, and this effect disappears with the inclusion of controls in column 5. The results are again similar if *EarnRank* is measured as a percentile. The interpretation here is that seasonality is not associated with higher returns in months in the months immediately following a predicted earnings announcement.

3.5 Earnings Seasonality and Delayed Reaction to Firm Specific Information

While the results in subsection 3.3 and 3.4 suggest that the seasonality effect is not driven by information from the fixed cross-section of firms, it is possible that seasonality in firms is correlated with some other recent firm-specific information that tends to get announced in earnings months. This may relate to some other property of earnings change (such as earnings growth), or any other number of changes in the firm. *EarnRank* is already constructed using 5 years of data and then lagged one year before portfolios are formed, so by its nature it contains information from a long time period, but some information flows over this period may be driving the results.

Rather than trying to control separately for each different type of firm information, we test a common prediction of such theories: namely, that firm-specific information should become less relevant over time. Seasonality, however, is mainly trying to capture a long-term perspective on how variable the firm's earnings are. As this is mainly a property of the firm's underlying business model, it is likely to be quite persistent over time. In addition, the timing of earnings announcements is strongly persistent over time (Frazzini and Lamont (2006)).

To test whether firm-specific information explains our results, we thus simply lag the *EarnRank* measure over different lengths of time. We show this in Table IV. In Panel A, we consider the effects of seasonality from the same quarter of the year, but lagged in various multiples of 12 months, when forming portfolios. This retains the prediction of seasonality from the current quarter, but omits more and more of the recent earnings news of the firm. We examine lags of up to ten years. While this restriction conditions on firms having a longer time series of data, the resulting selection effect is equal between the long and short legs of the portfolio, so should not affect the difference portfolio results.

The results show that the statistically significant abnormal returns are available even when using information that is over 6 years old (that is, the *EarnRank* measure is computed using earnings information over the range of 6 years to 11 years before the portfolio formation date). This holds for both the equal-weighted and value-weighted portfolios. The results are directionally similar, although weaker, even when the most recent earnings information is from 10 years ago. A curious aside is that the main effects actually get slightly larger when lagged three years (44.5 basis points equal-weighted, 66.3 basis points value-weighted).

In Panel B, we consider another prediction of delayed response to firm-specific earnings information – that seasonality should only positively predict returns for the same quarter as the measure, not other quarters. If high seasonality effects were driven by a slow response to some other correlated earnings news (such as earnings growth), the effect should be present when lagged at other multiples of 3 months, and indeed ought to be stronger for horizons less than 12 months. When *EarnRank* is lagged 3 months (i.e. using the most recent earnings information), there is no spread in returns. At 6 months there is a similar effect to 12 months, but the effect is weaker at 18 months. At 9 months, the spread is significantly negative when value-weighted, but not when equal-weighted.

These results are difficult to reconcile with seasonality measuring some firm-specific information flows that are common to recent earnings announcements – earnings information shows persistent effects at long multiples of 12 months (consistent with a seasonality effect), but generates weaker and different patterns at other horizons.

4. Possible Explanations for the Seasonality Effect.

4.1 Earnings Announcement Risk and Analyst Forecast Errors

Given the persistence in returns documented in section 3.4, one possible explanation for the high expected returns in high seasonality months is that these represent compensation for risk. While the regressions in sub-sections 3.3 suggest that the patterns in returns are not driven by fixed risk-loadings, it is possible that the fact that firms are announcing a larger proportion of their total annual earnings may make the announcement exposed to greater systematic risk that the investor cares about. Such a result would be consistent with the Savor and Wilson (2011) argument about the earning announcement premium. In this view, stocks have greater exposure to economic risk in months when they announce earnings, because their results will depend more on aggregate economic conditions. If this is the case, then the firm ought to have larger risk during earnings announcements that are expected to make up a larger fraction of total annual earnings.

There are a couple of facts that militate somewhat against this explanation. Firstly, the increase in risk must be due to systematic risk exposure – if the exposure is simply firm-specific, then an investor who holds a diversified portfolio of seasonal stocks will not be exposed to any greater risk, and hence should not require a higher expected return. Secondly, any exposure to risk must not simply be a greater exposure to market returns during that month, as the four factor regressions already control for the possibility of different market betas between the long (high seasonal) and short (low seasonal) portfolios. There must be some other systematic announcement risk factor that investors are concerned about, as Savor and Wilson (2011) postulate.

Perhaps most importantly, Table I Panel B indicates that the portfolio of highly seasonal firms does not seem to have more volatile returns than the portfolio of low seasonal firms. The volatility of the long and the short legs is similar, and high seasonal firms actually have directionally less volatility. While this does not conclusively rule out a greater exposure to particular sources of risk, it does suggest that any systematic risk exposure is being offset by lower risk exposure elsewhere such that the overall volatility is not different.

Because it is hard to specify all possible ways that systematic risk could operate here, we instead focus on an alternative prediction of the hypothesis that the returns are simply compensation for risk, namely that market participants should not show a more positive average ex post surprise when cash flows are announced. Earnings risk operates only through the discount rate channel – investors require higher returns in high seasonal months because of their risk, not because investors are experiencing larger positive surprises. In the case of earnings, we can test the latter possibility quite cleanly because of the existence of analysts' forecasts of earnings. Since these are pure forecasts of cash flows, the mean level of the surprise should not be affected by seasonality under a risk-based explanation. There may be greater variability in forecast errors in months where earnings are larger, but any change in the mean level of forecast error is *prima facie* evidence that analysts are relatively more pessimistic in months of high seasonality.

We examine this possibility in Table V. We examine whether analysts tend to be more positively surprised by firm earnings when seasonality is higher. The unit of observation is at the firm/date level, and the main dependent variable is the forecast error associated with the median quarterly earnings per share forecast, taken over all analysts making forecasts between 3 and 90 days before the earnings announcement. The forecast surprise is calculated as (Actual EPS – Forecast EPS) / Price (*t*-3). In terms of independent variables, in columns 1-4 we add controls for the log number of estimates being made, the standard deviation of forecasts (divided by the price three days before the announcement), the log market capitalization in the previous month, the log book to market ratio, stock returns for the previous month and the previous two to twelve months cumulated, as well as the previous four earnings surprises.

In the univariate specification in column 1, the coefficient on *EarnRank* is 0.023, with a *t*-statistic of 7.77 when clustered by firm and day. This shows that the earnings forecast error is more positive in months of high seasonality. In columns 2-7, controls are successively added for number and dispersion of analyst forecasts, firm characteristics (log market cap, log book to market ratio, stock return in the previous month, and momentum), and lagged values of forecast errors at up to 4 quarters. The results show that the effect of seasonality on forecast errors remains, with the coefficient with all firm-level controls being 0.011 with a *t*-statistic of 3.64. In column 5-7, we add date and firm fixed effects to control for omitted variables related to overall firm-differences and time-series changes in the overall analyst mistakes. The effects are substantially similar, indicating that the effect of seasonality on forecast errors is not simply an effect of the types of firms likely to be highly seasonal or the periods of the sample when high seasonality is more common. Table V indicates, at a minimum, that explanations relative to earnings risk are insufficient to explain the seasonality effect, as there is also substantial variation in forecast errors consistent with investors and analysts being more positively surprised by firm cash flows during high seasonality quarters.

4.2 Underreaction to Seasonality, the Recency Bias and Levels of Recent Earnings

The second broad class of explanation for seasonality affecting stock returns is that markets are underreacting to the information contained in past seasonality information. If investors do not fully account for the fact that earnings are predictably high in certain quarters, then they may be positively surprised when upcoming earnings are at high levels. The results in Table V suggest that analysts seem to be more positively surprised in high seasonal quarters. Though this does not necessarily mean that other investors are also more surprised, it does suggest the possibility of a common reaction of positive surprise by financial market participants which may be driving the high returns.

While underreaction thus provides a class of potential explanation distinct from risk, it is somewhat unsatisfying without a further understanding of *why* investors are underreacting. Underreaction as an explanation becomes more compelling if it can be combined with an understanding of the psychological reason for the underreaction. This is particularly important in light of the Fama (1998) critique that apparent underreactions are about as common as apparent overreactions. In the current context however, there are particular reasons in psychology why investors may underreact to seasonality.

The first possible basis for underreaction is the recency bias. As Murdock Jr (1962) and many other subsequent studies have documented, individuals are more likely to recall and overweight recent data relative to older data. See Davelaar et al. (2005) for a review of this literature. Seasonality as we measure it represents a long-run statement about the relative size of earnings in the upcoming quarter relative to other quarters of the year. Mechanically, if the firm has relatively more earnings in the upcoming quarter then it must have relatively less in the other quarters of the year. If the historical pattern in earnings continues as before, then firms in the high seasonality portfolio will typically have announced large earnings 12 months ago, but lower earnings over the subsequent 3 announcements. If investors suffer from a recency bias, then the three more recent announcements may be more salient when forming expectations of the upcoming earnings announcement. On average this will cause them to be too pessimistic in highly seasonal quarters.

Importantly, this explanation generates additional testable predictions. In particular, a high seasonality measure only says that the three most recent announcements *on average* are expected to be lower than the announcement 12 months ago. If the recency bias is driving the seasonality effect, then the returns should be higher when subsequent announcements *actually were lower ex post*. This is the necessary basis for the investor underreaction. If the ex-post news since the high seasonal quarter was actually positive, then a recency bias would not cause investors to be overly pessimistic about the upcoming high seasonal quarter.

We test this prediction in Tables VI and VII, by examining how the seasonality effect is impacted by recent earnings news. In Table VI, we test whether the returns in the seasonality long/short portfolio depend on how much earnings have decreased since the same quarter announcement last year. We form a two-way sort of stocks. The first sort is similar to before - whether or not the firm is above or below the median earnings rank that month. For the second sort, we split stocks according to whether they are above or below the median gap between the average of the three earnings announcement before portfolio formation and the announcement 12 months ago (with earnings scaled by firm assets per share). We examine the returns to the seasonality difference portfolio for when the recent earnings gap is high, when the gap is low, and the double difference portfolio.

Table VI presents these results. In Panel A, consistent with the predictions of the recency bias, when recent earnings are more negative relative to earnings 12 months ago, the seasonality effect is larger. The long/short seasonality portfolio among firms with lower earnings in the most recent announcements earns abnormal returns of 63 basis points equal weighted and 64 basis points value weighted, both significant at the 1% level. By contrast, the long/short seasonality portfolio has lower returns when implemented among firms whose recent earnings were higher – 24 basis points equal weighted, and 3 basis points value weighted. The double difference is statistically significant at the 5% level when equal weighted and the 1% level when value weighted. Similar results are obtained (not tabulated) if we instead sort on the gap only between the last earnings announcement and the announcement 12 months ago.

One possible concern with the previous regressions is that by conditioning on low recent earnings we are somehow picking up firms that are more seasonal overall. To test whether this may be driving the results in Panel B, we perform the same double sort but instead of computing the gap between earnings occurring after the announcement 12 months ago, we instead compute the gap between the three earnings announcements *before* the announcement 12 months ago (i.e. announcements that are on average 15, 18 and 21 months before portfolio formation, instead of in Panel A where they are on average 3, 6 and 9 months before portfolio formation). Under a recency bias, low earnings in this period should not produce a spread in returns. This double sort produces a gap in returns that is smaller in magnitude and statistically insignificant. This reinforces the conclusion that what matters is the level of the *most recent* earnings relative to those 12 months ago, consistent with the predictions of the recency bias.

In Table VII, we consider an alternative measure of when investors are less likely to be pessimistic about upcoming news – when the firm has broken an earnings record in the past 12 months. Since earnings records are a salient indicator of the firm having improved future prospects, record high recent earnings are likely to be highly weighted when investors forecast returns and thus seasonality effects should be truncated if they are driven by a recency bias. Similar to Table VI, we perform a double sort of stocks according to whether or not they have broken a previous earnings record in the past 12 months.

Consistent with recency, we find that the effects of seasonality are significantly higher among firms who have not recently broken a record. The double difference portfolio has abnormal returns of 34 basis points when equal weighted and 61 basis points when value weighted, both significant at the 1% level. In addition, the seasonality difference portfolio among firms that have recently broken a record has abnormal returns that are directionally negative and statistically indistinguishable from zero. These results confirm the view from Table VI that the seasonality effect is larger when firms have had lower recent earnings.

4.3Alternative Explanations – Investor Attention and Increases in Volume

Another possible explanation for the seasonality effect may be related to increased investor attention. If high seasonality announcements are more newsworthy, they may attract greater attention from investors. Individual investors tend to be net buyers of stocks that are in the news, regardless of whether the news is god or bad (Barber and Odean (2008)). Frazzini and Lamont (2006) argue that the predictable increase in volume around earnings announcements is associated with the level of returns. In particular, firms whose volume is historically higher in earnings announcement months relative to other months also have higher earnings announcement returns. It is possible that the same effect may be driving the seasonal patterns we document – higher seasonal quarters have higher returns than low seasonal quarters because they also have more volume than low seasonal quarters.

To test this, we take the same set of earnings announcements from one year ago to 6 years ago used to form the earnings rank measures, and examine the relative level of trading volume in the upcoming quarter. We form a ratio of the average volume from the past 5 announcements in the same fiscal quarter as the upcoming announcement, divided by the average volume from the 20 announcements starting 12 months ago. This measure is the within-earnings-announcement analogue of Frazzini and Lamont (2006) – is trading volume generally higher for earnings announcements in the current quarter relative to other quarters? Similar to Table VI and VII, we double sort firms into portfolios according to the level of the volume in the upcoming quarter and the earnings rank. If the seasonality effect is merely proxying for the increase in volume, we should see a spread when sorting on volume, but not see a spread when sorting on seasonality after controlling for the level of volume increase. If the seasonality effect is exacerbated by trading volume, we should see a higher effect of seasonality for firms that also have a larger increase in volume.

Table VIII shows that neither result holds – the increase in volume does not appear to drive returns in seasonal months. The seasonality difference portfolio shows similar returns when formed among firms that have a relatively high trading volume in that quarter or firms that have a relatively low trading volume that quarter. The double difference portfolio earns 3 basis points when equal-weighted and 17 basis points when value weighted, with neither being significant. In addition, the abnormal returns to the seasonality difference portfolio are individually significant for equal-weighted low turnover, equal-weighted high turnover and value-weighted high turnover (with value-weighted low turnover on its own being insignificant). By contrast, sorting on the volume increase never produces significantly positive returns, and produces weakly negative returns using equal-weighted portfolios. Overall, the results suggest that seasonality is not driven by an increase in trading volume during high seasonal months.

4.4 Alternative Explanations – Earnings Management

Another possible explanation for the high returns in high seasonality months is that firms are deliberately managing their earnings so as to report more positive surprises in those quarters. Company management may view it as more important to generate positive surprises in their biggest earnings quarter, since this may be viewed as being the important signal about the company's overall prospects. This would still raise the question of why investors are not able to observe the pattern in earnings management that seasonality represents, but earnings management may nonetheless form part of the reason for the high returns.

To test this, we examine whether the seasonality effect is related to other measures of earnings management – whether firms are actually managing their earnings, or whether they might be expected to do so. We examine three possible measures. Firstly, we sort on the level of accruals. Sloan (1996) documents that accruals (earnings that do not generate cash flows in the current period) show less persistence than cash flows, and are associated with lower future returns. Part of this effect may be due to managers recognizing cash flows early in order to boost earnings in the current period. As in Sloan (1996), we measure accruals from annual balance sheet and earnings items as follows:

$$Accruals_t = (\; (\Delta \text{Current Assets}_t \; f \; - \Delta \text{Cash}_t) - (\Delta \text{Current Liabilities}_t - \Delta \text{Short-term Debt}_t$$

$$- \Delta \text{Taxes Payable}_t) - \text{Depreciation and Amortization Expense}_t) \; /$$

$$((\text{Total Assets}_t + \text{Total Assets}_{t-1})/2)$$

Second, we examine the fraction of times in the past year that the firm beat the median analyst forecast by a penny or less. As in Cohen, Malloy and Lou (2013), this may be associated with firms being willing to manage earnings in order to just beat market expectations. Finally, we examine the level of governance in the firm, using the 'G' measure of governance in Gompers, Ishii and Metrick (2003). Firms with weaker governance may have less ability to restrain managers from managing earnings in a way that does not increase long term value. The prediction in all cases is that if seasonality is driven by earnings management, the effect should be larger among firms that show other evidence of earnings management, or who have fewer constraints on their ability to manage earnings.

We present these results in Table IX. For all variables, we perform double sorts according to the level of earnings rank and the various earnings management measures. Panel A examines accruals, Panel B examines beating earnings by a penny and Panel C examines governance. The results do not show any positive association between earnings management and seasonality returns. In Panels B and C, the double difference portfolio shows no relationship between seasonality and either beating forecasts by a penny or levels of governance. In Panel A, firms with higher accruals actually have a lower seasonality effect, not a higher one. Overall, seasonality does not seem to be positively associated with other measures of earnings management.

4.5 Robustness - Between-Industry versus Within-Industry Seasonality

One question about seasonality is the nature of the mistake that investors are making. Investors may be neglecting the importance of industry-wide information about earnings seasonality, or may be failing to consider how seasonal each firm is relative to the overall industry seasonality. Both would be consistent with different versions of a recency bias, but might suggest alternative mechanisms. We test these predictions in Table X.

In columns 1 and 2, we examine the effect of seasonality levels with each industry. We repeat the same analysis as in Table II, except that we form sort firms into quintile portfolios according to the distribution of *EarnRank* relative to the firm's industry, using the Fama and French (1988) 48 industry portfolios. The results are very similar to the overall sorts in Table II – the equal-weighted difference portfolio using within-industry sorts produces abnormal returns of 34 basis points per month with a *t*-statistic of 3.17, while the value-weighted difference portfolio produces abnormal returns of 50 basis points per month with a *t*-statistic of 2.98.

In columns 3 and 4, we test the effect of the average industry level of seasonality. We use industry portfolios of firms with predicted earnings announcements as our test assets. These industry portfolios are then grouped together into final portfolios according to the average level of seasonality in that industry/quarter combination. The question of what equal-weighted and value-weighted mean in this context is not straightforward, as there are three levels of choices – whether the industry-wide averages of *EarnRank are* computed on an equal-weighted or value-weighted basis, whether the industry-average returns portfolios are equal-weighted or value-weighted, and finally whether the portfolios of industry portfolios are equal-weighted or value-weighted by the total market capitalization of that industry. We show the results for choosing 'equal' for all three decisions and choosing 'value' for all three decisions, although the results are similar for other permutations.

For the equal-weighted option, the results of sorting on industry are slightly stronger than the main sort, with the difference portfolio having abnormal returns of 40.8 basis points per month with a *t*-statistic of 2.66. In this case, the lowest quintile of *EarnRank* has no abnormal returns at all. For the value-weighted results, the difference portfolio has a somewhat lower spread in returns than before – 30.6 basis points, with a *t*-statistic of 1.84. The lower spread is mainly attributable to the greater returns on the short leg (24.8 basis points), as the long leg is similar to the base sort (54.6 basis points).

Overall, these results indicate that the seasonality effect is present both within industries and across industries (with the 'within industries' split being somewhat more robust). In untabulated results, both within-industry and between-industry measures are significantly related to returns when tested simultaneously using Fama Macbeth regressions.

4.6 Robustness – Alternative Measures of Earnings Seasonality

The main effect of *EarnRank* is effectively a measure of how reliably earnings in a given quarter are larger than in other quarters over the previous five years. By computing the average rank from the same quarter over the past 4 years, *EarnRank* prioritizes firms whose earnings are *consistently* highest in a given quarter, but does not take into account *how much bigger* earnings are in each quarter. An alternative way of thinking about seasonality involves the size of the gap between earnings in a given quarter and earnings in other quarters. To test this notion, we compute *EarnGap,* taken as the ratio of average earnings in the current quarter over the past five years, divided by average earnings in all other quarters over the past five years.

We consider the effect of this alternative measure of seasonality in Table XI. We sort firms into quintiles based on their level of *EarnGap.* For the equal-weighted portfolio, the results are somewhat weaker, with abnormal return of 23 basis points that is weakly significant at a 10% level. When returns are value-weighted, the *EarnGap* measure is somewhat stronger than *EarnRank*, with abnormal returns of 77 basis points with a *t*-statistic of 3.43. Overall, this implies that that the patterns in returns are related to both the size and reliability of earnings seasonality, consistent with the basic idea of seasonal earnings.

4.7 Robustness – Calendar Quarters of the Year

Finally, we examine how the returns to the seasonality portfolio vary over the calendar year. We examine the returns to the low quintile, high quintile and difference portfolio of earnings rank split out according to the quarter of the year. The results are presented in Table XII. The largest returns are present in the first quarter of the year, consistent with firms having larger seasonality in those periods due to Christmas (recall that breakpoints are defined based on the seasonality distribution each month, so a wider overall level of seasonality will mean that the extreme quintiles will be selecting firms with more extreme seasonality in that month). Because the number of observations is reduced by three quarters in each separate regression relative to the base table, the overall significance is reduced, and most of the specifications are not significant. However, the point estimate of the difference portfolio exceeds 15 basis points in all specifications, and is mostly in the 20-40 basis points range, consistent with Table II.

6. Conclusion

In this paper, we document a new stylized fact about earnings returns – that stocks exhibit high earnings announcement returns in quarters of the year when historically their earnings tend to be larger than normal. This effect does not appear to be driven by a delayed reaction to firm-specific news or standard loadings on risk factors, nor is it a general property of earnings news in other quarters. High seasonality quarters also display greater positive surprise by analysts, suggesting the effect cannot be explained solely by announcement risk.

We present evidence that the effect is linked to the tendency of investors to underreact to information in seasonality. Investors who suffer from a recency bias may place too much weight on the lower average earnings that follow a high seasonal quarter, causing them to be too pessimistic by the time the high seasonal quarter comes around again. Consistent with this view, the effects of seasonality are larger when earnings since the last high seasonal quarter are at lower levels.

The results in this paper are consistent with investors being less likely to process information when it is not salient. This suggests that even when earnings information is widely available and opportunities for learning are frequent, investors may still face other behavioral constraints that prevent them from fully processing it.

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Table I – Summary Statistics

This table presents summary statistics for the main variables used in the paper. Panel A presents the distribution of firm-level characteristics, included market capitalization (in millions of dollars), the log of the ratio of book value of equity to market value of equity, stock returns in the current month, from 2 to 12 months ago, and the average returns from 12, 24, 36, 48 and 60 months ago ('Return Seasonality', as in Heston and Sadka (2008)). Return variables are also shown separately for months a predicted earnings announcement, defined as when the stock had a quarterly earnings announcement 12 months prior. Earnings rank at each time is calculated by taking 5 years of earnings data and ranking each announcement by the earnings per share (adjusted for stock splits, etc.).The earnings rank variable is formed by taking the average rank of the 5 announcements from the same fiscal quarter as that of the current announcement. In Panel B, we show the returns of portfolios sorted by earnings rank. In all portfolios, the earnings rank measure is lagged 12 months from the return date, meaning that earnings information is taken from one year ago to six years ago, and used to forecast the seasonality for the upcoming predicted announcement. We sort stocks each month into quintiles according to the distribution of earnings rank that month, with quintile 5 corresponding to stocks where the earnings were historically higher than normal in the upcoming quarter and quintile 1 corresponding to stocks with the earnings were historically lower than normal in the upcoming quarter. 'EW' and 'VW' refer to equal-weighted and value-weighted portfolios respectively. The data runs from September 1972 to October 2013.

Panel A - Stock Characteristics

Variable	Mean	Standard Deviation	25th Pctile	Median	75th Pctile	N
All Firms, All Months						
Market Capitalization	1424.18	9354.32	30.00	107.72	475.77	2,460,113
Log Book to Market Ratio	-0.54	0.84	-1.00	-0.47	0.01	1,705,906
Return (%)	1.04	12.93	-5.22	0.38	6.58	2,469,021
Return 2 to 12 months ago (%)	21.80	67.10	-9.65	11.45	37.57	2,246,753
Return Seasonality (%)	1.61	5.90	-1.66	1.21	4.34	1,663,983
Number of Stocks						21,189
Number of Stock*Months						2,469,039
Predicted Earnings Announcement Months						
Earnings Rank	10.85	2.85	9.10	11.00	12.60	302,474
Return (%)	1.14	13.86	-5.75	0.61	7.41	472,442
Return 2 to 12 months ago (%)	22.45	72.47	-10.19	11.55	38.36	470,522
Return Seasonality (%)	1.88	6.47	-1.80	1.42	4.94	372,715
Number of Stocks						14,420
Number of Stock*Months						472,442

Panel B - Summary Statistics for Portfolio Returns													
Weight	**Earnings Rank**	**Avg. Return**	**Std. Dev. Returns**	**Sharpe Ratio**	**Min**	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**	**Max**
EW	1 (Low)	1.44	5.29	0.19	-25.84	-7.17	-4.31	-1.41	1.73	4.48	7.38	9.13	23.65
EW	5 (High)	1.72	5.10	0.25	-22.56	-6.71	-3.96	-1.24	1.89	4.99	7.33	9.09	20.84
EW	5 -1	0.28	2.30	0.12	-14.13	-3.17	-2.32	-0.99	0.31	1.53	2.89	3.70	10.77
VW	1 (Low)	1.33	5.13	0.17	-21.91	-6.57	-4.43	-1.43	1.32	4.31	7.12	9.51	18.10
VW	5 (High)	1.68	5.03	0.25	-18.34	-6.07	-4.37	-1.47	1.45	4.74	7.76	9.51	27.39
VW	5 -1	0.35	3.56	0.10	-15.17	-5.01	-3.56	-1.72	0.13	2.17	4.36	6.02	16.35

Table II – Earnings Seasonality and Abnormal Returns

This table presents the abnormal returns to portfolios formed on measures of earnings seasonality. For each stock with a quarterly earnings announcement 12 months ago, we rank earnings announcements from six years ago to one year ago by their earnings per share (adjusted for stock splits, etc.). The earnings rank variable is formed by taking the average rank of the 5 past announcements from the same fiscal quarter as that of the expected upcoming announcement. We sort stocks each month into quintiles according to the distribution of earnings rank that month, with quintile 5 corresponding to stocks where the earnings were historically higher than normal in the upcoming quarter and quintile 1 corresponding to stocks with the earnings were historically lower than normal in the upcoming quarter. 'EW' and 'VW' refer to equal-weighted and value-weighted portfolios respectively. Abnormal returns under a four factor model are calculated by regressing portfolio excess returns on excess market returns, SMB, HML and UMD from Ken French's website. In Panel A, all firms are included. In Panel B, we examine the top and bottom quintiles only for stocks that were also in the other extreme quintile within 9 months either side of the current month. The data runs from September 1972 to October 2013. *, ** and *** denote significance at the 10%, 5% and 1% level

Panel A - Base Four Factor Regressions

Earnings Rank	(VW) Intercept	(EW) Intercept	MKTRF	SMB	HML	UMD	R2	N
1 (Low)	0.339 ***	0.291 ***	0.947 ***	0.563 ***	0.368 ***	-0.046 **	0.865	492
	(2.67)	(3.14)	(45.02)	(18.89)	(11.49)	(-2.26)		
2	0.119	0.292 ***	0.993 ***	0.703 ***	0.294 ***	-0.023	0.895	492
	(0.88)	(3.33)	(49.85)	(24.92)	(9.70)	(-1.18)		
3	0.374 ***	0.269 ***	0.997 ***	0.686 ***	0.180 ***	-0.045 **	0.900	491
	(2.71)	(3.11)	(50.51)	(24.63)	(6.00)	(-2.40)		
4	0.288 **	0.373 ***	1.012 ***	0.653 ***	0.177 ***	0.027	0.914	491
	(2.00)	(4.70)	(56.21)	(25.56)	(6.46)	(1.54)		
5 (High)	0.835 ***	0.632 ***	0.928 ***	0.496 ***	0.273 ***	-0.043 **	0.870	492
	(6.01)	(7.20)	(46.50)	(17.55)	(9.00)	(-2.22)		
5 - 1	0.496 ***	0.342 ***	-0.019	-0.067 *	-0.095 **	0.003	0.019	492
	(2.98)	(3.17)	(-0.79)	(-1.93)	(-2.54)	(0.14)		

Panel B -Portfolios Using Only Within-Firm Variation

Weighting	Earnings Rank	Intercept	MKTRF	SMB	HML	UMD	R2	N
EW	1 (Low)	0.309 ***	0.913 ***	0.408 ***	0.393 ***	-0.032	0.808	466
		(2.92)	(38.05)	(11.97)	(10.82)	(-1.36)		
EW	5 (High)	0.766 ***	0.907 ***	0.406 ***	0.400 ***	-0.034	0.812	469
		(7.40)	(38.67)	(11.95)	(11.17)	(-1.48)		
EW	5 - 1	0.416 ***	-0.003	-0.018	-0.003	0.004	0.001	463
		(3.44)	(-0.13)	(-0.47)	(-0.07)	(0.16)		
VW	1 (Low)	0.443 ***	0.967 ***	-0.067	0.112 **	0.068 **	0.680	466
		(3.10)	(29.74)	(-1.45)	(2.28)	(2.14)		
VW	5 (High)	0.864 ***	0.872 ***	-0.101 *	0.032	0.052	0.565	469
		(5.18)	(23.11)	(-1.85)	(0.55)	(1.41)		
VW	5 - 1	0.451 **	-0.107 **	-0.037	-0.090	-0.016	0.015	463
		(2.28)	(-2.38)	(-0.58)	(-1.32)	(-0.37)		

Table III – Fama Macbeth Cross Sectional Regressions Using Earnings Seasonality

This Table presents the results of Fama and Macbeth (1973) cross-sectional regressions that consider the effect of earnings seasonality on stock returns. The main independent variable is earnings rank. For each announcement, we rank earnings announcements from six years ago to one year ago by their earnings per share (adjusted for stock splits, etc.). The earnings rank variable is formed by taking the average rank of the 5 past announcements from the same fiscal quarter as that of the upcoming announcement. This variable is included both as a raw number, and as a percentile of firms that month. Additional controls are included for dummy variables of whether the stock has a predicted earnings announcement, a predicted dividend, Heston and Sadka (2008) Seasonality (the average returns of the stock from 12, 24, 36, 48 and 60 months ago), the log market capitalization from the previous month, the log book to market ratio, the previous month's stock return, and the stock returns from 2 to 12 months ago. Each month, a separate regression is run on the cross-section of stocks using returns as the dependent variable and the control variables as independent variables. The time series of coefficients for each variable is then averaged to give the final coefficient, and the *t*-statistic for the mean of the series of coefficients is reported in parentheses. Columns 1-4 use only firms that had an earnings announcement 12 months ago, while columns 5-8 use all firms. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

	Only Firm Months with Predicted Earnings				All Firm Months			
	1	2	3	4	5	6	7	8
Earnings Rank (raw)	0.038	0.037			-0.013	-0.006		
	(3.21) ***	(3.29) ***			(-1.70) *	(-0.89)		
Earnings Rank (raw) *					0.051	0.039		
Predicted Earnings					(3.83) ***	(3.14) ***		
Earnings Rank (Pctile)			0.292	0.310			-0.142	-0.075
			(2.44) **	(2.68) ***			-1.895 *	(-1.11)
Earnings Rank (Pctile) *							0.434	0.342
Predicted Earnings							(3.25) ***	(2.68) ***
Predicted Earnings					-0.164	-0.056	0.165	0.183
					(-1.03)	(-0.38)	(1.73) *	(2.09) **
Predicted Dividend		0.2311		0.2274		0.279		0.277
		3.3952 ***		3.2879 ***		(5.93) ***		(5.88) ***
Heston and Sadka (2008)		2.995		3.119		3.403		3.381
Seasonality		(3.87) ***		(4.07) ***		(6.18) ***		(6.16) ***
Log Market Cap		0.020		0.019		-0.040		-0.039
		(0.59)		(0.55)		(-1.43)		(-1.37)
Log Book to Market		0.381		0.410		0.237		0.246
		(4.72) ***		(5.09) ***		(3.73) ***		(3.84) ***
Momentum		0.476		0.388		0.549		0.509
		(2.58) **		(2.19) **		(3.39) ***		(3.17) ***
Return (t-1)		-4.587		-4.465		-3.684		-3.752
		(-8.66) ***		(-8.34) ***		(-9.03) ***		(-9.20) ***
Avg. R-Sq	0.004	0.064	0.004	0.064	0.005	0.051	0.005	0.051
N	494	492	494	492	494	494	494	494

Table IV – Earnings Seasonality at Different Horizons

This table presents the abnormal returns to portfolios formed on measures of earnings seasonality, lagged at different horizons. The base earnings rank measure considers 5 years of earnings announcements, and ranks each announcement by the earnings per share (adjusted for stock splits, etc.). The earnings rank variable is formed by taking the average rank of the 5 announcements from the same fiscal quarter as that of the expected upcoming announcement. Panel A considers the measure lagged at different multiples of 12 months (so that the seasonality estimates are for the same quarter as the upcoming one). '12' uses data from 1 year ago to 6 years ago, '24' uses data from 2 years to 7 years ago, etc. Panel B considers the measure lagged at different multiples of 3 months, so each stock is still predicted to have an earnings announcement that month, but for multiples other than 12 and 24 the seasonality measure applies to a different quarter than the upcoming announcement. In both cases, stocks are sorted each month into quintiles according to the distribution of earnings rank that month, with quintile 5 corresponding to stocks where the earnings were historically higher than normal in the lagged period and quintile 1 corresponding to stocks with the earnings were historically lower than normal in the lagged period. Abnormal returns under a four factor model are calculated by regressing portfolio excess returns on excess market returns, SMB, HML and UMD from Ken French's website.. The data runs from September 1972 to October 2013. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

Panel A - Seasonality at Different Annual Horizons

		Months Lagged									
Weighting	**Earnings Rank**	**12**	**24**	**36**	**48**	**60**	**72**	**84**	**96**	**108**	**120**
EW	1 (Low)	0.239 ***	0.201 **	0.221 **	0.163 *	0.120	0.225 **	0.273 ***	0.313 ***	0.277 ***	0.245 **
		(2.87)	(2.36)	(2.45)	(1.73)	(1.28)	(2.21)	(2.87)	(3.21)	(2.65)	(2.31)
EW	5 (High)	0.597 ***	0.616 ***	0.666 ***	0.586 ***	0.570 ***	0.524 ***	0.504 ***	0.426 ***	0.482 ***	0.462 ***
		(6.86)	(7.23)	(7.39)	(6.73)	(6.13)	(5.65)	(5.19)	(4.21)	(4.79)	(4.48)
EW	5 - 1	0.346 ***	0.415 ***	0.445 ***	0.423 ***	0.450 ***	0.299 **	0.231 **	0.117	0.222 **	0.216 *
		(3.40)	(4.02)	(4.18)	(4.19)	(4.28)	(2.58)	(2.08)	(1.03)	(2.01)	(1.79)
VW	1 (Low)	0.332 ***	0.216 *	0.161	0.202	0.226	0.234	0.281 *	0.295 *	0.226	0.342 **
		(2.66)	(1.75)	(1.19)	(1.48)	(1.49)	(1.36)	(1.92)	(1.95)	(1.37)	(2.08)
VW	5 (High)	0.843 ***	0.791 ***	0.824 ***	0.684 ***	0.688 ***	0.797 ***	0.636 ***	0.569 ***	0.592 ***	0.625 ***
		(6.03)	(5.79)	(5.78)	(4.84)	(4.55)	(4.74)	(4.15)	(3.78)	(3.71)	(4.12)
VW	5 - 1	0.509 ***	0.576 ***	0.663 ***	0.481 ***	0.463 **	0.563 **	0.355 *	0.276	0.366	0.280
		(3.07)	(3.47)	(3.66)	(2.65)	(2.28)	(2.37)	(1.83)	(1.34)	(1.61)	(1.27)

Panel B - Seasonality at Different Quarterly Horizons

		Months Lagged							
Weighting	**Earnings Rank**	**3**	**6**	**9**	**12**	**15**	**18**	**21**	**24**
EW	1 (Low)	0.200 **	0.050	0.333 ***	0.239 ***	0.259 ***	0.244 ***	0.387 ***	0.201 **
		(2.43)	(0.60)	(3.95)	(2.87)	(3.21)	(3.07)	(4.30)	(2.36)
EW	5 (High)	0.218 ***	0.396 ***	0.334 ***	0.597 ***	0.133 *	0.362 ***	0.295 ***	0.616 ***
		(2.75)	(5.03)	(4.35)	(6.86)	(1.66)	(4.61)	(3.70)	(7.23)
EW	5 - 1	0.017	0.345 ***	0.009	0.346 ***	-0.127	0.118	-0.092	0.415 ***
		(0.18)	(3.35)	(0.10)	(3.40)	(-1.32)	(1.27)	(-0.93)	(4.02)
VW	1 (Low)	0.537 ***	-0.016	0.715 ***	0.332 ***	0.469 ***	-0.035	0.678 ***	0.216 *
		(3.56)	(-0.12)	(5.25)	(2.66)	(2.97)	(-0.22)	(4.89)	(1.75)
VW	5 (High)	0.362 ***	0.369 **	0.106	0.843 ***	0.334 ***	0.274 *	0.056	0.791 ***
		(2.88)	(2.31)	(0.86)	(6.03)	(2.81)	(1.83)	(0.44)	(5.79)
VW	5 - 1	-0.175	0.385 *	-0.610 ***	0.509 ***	-0.135	0.309	-0.622 ***	0.576 ***
		(-0.93)	(1.66)	(-3.37)	(3.07)	(-0.68)	(1.41)	(-3.56)	(3.47)

Table V – Analyst Forecast Errors and Earnings Seasonality

This Table examines how analyst forecast errors vary with measures of earnings seasonality. The dependent variable is the difference between actual earnings per share and the median analyst forecast of earnings per share , divided by price three days before the announcement. Earnings forecasts are considered if made within 90 days of the announcement date. The main independent variable is earnings rank. For each announcement, we rank earnings announcements from six years ago to one year ago by their earnings per share (adjusted for stock splits, etc.). The earnings rank variable is formed by taking the average rank of the 5 past announcements from the same fiscal quarter as that of the upcoming announcement. Additional controls are included for the log of the number of estimates, for the standard deviation of analyst forecasts scaled by assets per share (set to zero for cases where there is only one analyst), a dummy variable for cases where there is only one forecast, and forecast errors from the previous four announcements. 'Stock Characteristics' includes the log market capitalization from the previous month, the log book to market ratio, the previous month's stock return, and the stock returns from 2 to 12 months ago. Standard errors are clustered by firm and date, and *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

Dependent variable is forecast error: earnings per share minus median analyst forecast, divided by price							
Earnings Rank	0.023***	0.021***	0.014***	0.011***	0.010 ***	0.012 ***	0.010 ***
	(7.77)	(7.14)	(4.96)	(3.64)	(3.17)	(3.94)	(3.04)
Log (# Estimates)		0.091***	0.017	0.015	-0.003	0.003	-0.013
		(2.98)	(0.56)	(0.50)	(-0.10)	(0.09)	(-0.39)
Forecast Dispersion		-0.410***	-0.377***	-0.336***	-0.322 ***	-0.290 ***	-0.271 ***
		(-8.13)	(-7.07)	(-6.21)	(-5.71)	(-5.03)	(-4.48)
Single Estimate (Dummy)		-0.146***	-0.094***	-0.072**	-0.074 **	-0.071 **	-0.067 *
		(-4.13)	(-2.70)	(-2.13)	(-2.02)	(-2.09)	(-1.83)
Forecast Error (t-1)				0.114***	0.106 ***	-0.011	-0.009
				(5.90)	(5.33)	(-0.43)	(-0.35)
Forecast Error (t-2)				0.089***	0.081 ***	0.007	-0.002
				(4.51)	(3.93)	(0.32)	(-0.07)
Forecast Error (t-3)				0.015	0.016	-0.055 ***	-0.053 **
				(0.90)	(0.89)	(-2.96)	(-2.56)
Forecast Error (t-4)				0.054***	0.053 ***	-0.004	-0.003
				(3.47)	(3.20)	(-0.25)	(-0.17)
Stock Characteristics	No	No	Yes	Yes	Yes	Yes	Yes
Date FE	No	No	No	No	Yes	No	Yes
Stock FE	No	No	No	No	No	Yes	Yes
Observations	79,229	79,229	77,566	64,338	64,338	64,338	64,338
R-squared	0.001	0.036	0.052	0.077	0.105	0.176	0.028

Table VI – Recent Earnings Levels and Earnings Seasonality Abnormal Returns

This table presents the abnormal returns to portfolios sorted on both measures of earnings seasonality and the level of other recent earnings announcement. Stocks are sorted based on whether they are above or below the median earnings rank for that month. The second sorting variable is the gap between recent earnings per share (divided by assets) and earnings from 12 months ago. In Panel A, firms are sorted by the difference between the average earnings the three most recent announcements before portfolio formation (typically, but not always, 3, 6 and 9 months before formation) and the announcement 12 months ago. In Panel B, firms are sorted on the gap between the average of the three earnings announcements before the announcement 12 months ago (typically, but not always, 15, 18 and 21 months before formation) and the level of earnings 3 months ago. Abnormal returns relative to a four factor model are shown for each portfolio, the difference portfolios, and the double difference portfolio. In all cases portfolio excess returns are regressed on excess market returns, SMB, HML and UMD from Ken French's website. In each row, the top number is the regression coefficient, the middle number in parentheses is the *t*-statistic, and the bottom number in brackets is the number of portfolio months. The data runs from September 1972 to October 2013. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

Panel A - Gap Between Recent Earnings and 12 Months Ago

Equal Weighted

Gap Between Earnings (3,6,9) Months Ago and 12 Month Ago	Earnings Rank Level: All	1 (Low)	2 (High)	2 - 1
All		0.274 ***	0.445 ***	0.171 **
		(4.20)	(6.54)	(2.50)
		{482}	{482}	{482}
1 (Non-Annual earnings more negative)	-0.016	-0.280 ***	0.357 ***	0.626 ***
	(-0.25)	(-2.67)	(4.46)	(5.86)
	{481}	{450}	{472}	{450}
2 (Non-Annual earnings more positive)	0.611 ***	0.527 ***	0.793 ***	0.241 **
	(8.47)	(6.32)	(8.58)	(2.58)
	{481}	{459}	{454}	{453}
	0.627 ***	0.826 ***	0.443 ***	-0.391 ***
2 -1	(8.28)	(7.08)	(4.91)	(-2.92)
	{481}	{450}	{454}	{449}

Value Weighted

Gap Between Earnings (3,6,9) Months Ago and 12 Month Ago	Earnings Rank Level: All	1 (Low)	2 (High)	2 - 1
All		0.303 ***	0.554 ***	0.251 *
		(3.14)	(5.01)	(1.84)
		{482}	{482}	{482}
1 (Non-Annual earnings more negative)	0.336 ***	0.006	0.644 ***	0.643 ***
	(3.02)	(0.04)	(4.74)	(3.11)
	{481}	{450}	{472}	{450}
2 (Non-Annual earnings more positive)	0.386 ***	0.379 ***	0.432 ***	0.028
	(3.85)	(3.37)	(2.76)	(0.16)
	{481}	{459}	{454}	{453}
	0.051	0.423 **	-0.230	-0.635 **
2 -1	(0.36)	(2.23)	(-1.20)	(-2.30)
	{481}	{450}	{454}	{449}

Panel B - Gap Between Older Earnings and 12 Months Ago				
Equal Weighted				
Gap Between Earnings (15,18,21) Months Ago and 12 Month Ago		**Earnings Rank Level**		
	All	1 (Low)	2 (High)	2 - 1
All		0.274 ***	0.445 ***	0.171 **
		(4.20)	(6.54)	(2.50)
		{482}	{482}	{482}
1 (Non-Annual earnings more negative)	0.258 ***	0.007	0.466 ***	0.433 ***
	(3.61)	(0.06)	(5.74)	(3.92)
	{478}	{451}	{470}	{451}
2 (Non-Annual earnings more positive)	0.393 ***	0.399 ***	0.674 ***	0.277 ***
	(5.78)	(5.09)	(6.61)	(2.62)
	{477}	{461}	{453}	{453}
2 -1	0.132 *	0.385 ***	0.235 **	-0.138
	(1.68)	(3.24)	(2.17)	(-0.91)
	{477}	{451}	{453}	{450}

Value Weighted				
Gap Between Earnings (15,18,21) Months Ago and 12 Month Ago		**Earnings Rank Level**		
	All	1 (Low)	2 (High)	2 - 1
All		0.303 ***	0.554 ***	0.251 *
		(3.14)	(5.01)	(1.84)
		{482}	{482}	{482}
1 (Non-Annual earnings more negative)	0.517 ***	0.130	0.657 ***	0.526 **
	(4.76)	(0.80)	(4.88)	(2.53)
	{478}	{451}	{470}	{451}
2 (Non-Annual earnings more positive)	0.228 **	0.303 **	0.515 ***	0.161
	(2.09)	(2.51)	(3.03)	(0.81)
	{477}	{461}	{453}	{453}
2 -1	-0.292 **	0.232	-0.125	-0.350
	(-2.03)	(1.12)	(-0.62)	(-1.14)
	{477}	{451}	{453}	{450}

Table VII – Recent Records and Earnings Seasonality Abnormal Returns

This table presents the abnormal returns to portfolios sorted on both measures of earnings seasonality and whether the stock had reached record earnings in the previous 12 months. For each stock with a quarterly earnings announcement 12 months ago, we rank earnings announcements from six years ago to one year ago by their earnings per share (adjusted for stock splits, etc.). The earnings rank variable is formed by taking the average rank of the 5 past announcements from the same fiscal quarter as that of the expected upcoming announcement. Stocks are sorted based on whether they are above or below the median earnings rank for that month. The second sorting variable is whether or not the stock had record earnings in the previous 12 months. Abnormal returns relative to a four factor model are shown for each portfolio, the difference portfolios, and the double difference portfolio. In all cases portfolio excess returns are regressed on excess market returns, SMB, HML and UMD from Ken French's website. In each row, the top number is the regression coefficient, the middle number in parentheses is the *t*-statistic, and the bottom number in brackets is the number of portfolio months. Panel A shows the returns to equal weighted portfolios, while Panel B shows the returns to value weighted portfolios. The data runs from September 1972 to October 2013. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

Panel A - Equal Weighted

Record Within Past Year	All	1 (Low)	2 (High)	2 - 1
		Earnings Rank Level		
All		0.274 ***	0.445 ***	0.171 **
		(4.20)	(6.54)	(2.50)
		{482}	{482}	{482}
No Recent Record	-0.130 ***	0.084	0.340 ***	0.257 ***
	(-3.35)	(1.14)	(4.61)	(3.01)
	{493}	{482}	{482}	{482}
Recent Record	0.262 ***	0.626 ***	0.542 ***	-0.084
	(4.50)	(5.86)	(5.88)	(-0.81)
	{493}	{482}	{482}	{482}
Recent - No Recent	0.392 ***	0.543 ***	0.202 **	-0.341 ***
	(7.41)	(4.90)	(2.20)	(-2.73)
	{493}	{482}	{482}	{482}

Panel B - Value Weighted

Record Within Past Year	All	1 (Low)	2 (High)	2 - 1
		Earnings Rank Level		
All		0.303 ***	0.554 ***	0.251 *
		(3.14)	(5.01)	(1.84)
		{482}	{482}	{482}
No Recent Record	-0.108 ***	0.042	0.577 ***	0.535 ***
	(-2.76)	(0.36)	(4.97)	(3.60)
	{493}	{482}	{482}	{482}
Recent Record	0.136 ***	0.558 ***	0.480 ***	-0.078
	(3.83)	(4.04)	(3.60)	(-0.45)
	{493}	{482}	{482}	{482}
Recent - No Recent	0.244 ***	0.517 ***	-0.097	-0.613 ***
	(3.60)	(2.95)	(-0.62)	(-2.79)
	{493}	{482}	{482}	{482}

Table VIII – Increases in Turnover and Earnings Seasonality

This table presents the abnormal returns to portfolios sorted on both measures of earnings seasonality and the average increase in turnover during announcements of the current quarter. Stocks are sorted based on whether they are above or below the median earnings rank for that month. The second sorting variable is the average share turnover in the past 5 announcements from the same fiscal quarter as the upcoming announcement, divided by the average turnover from all announcements in the 5 year period. Abnormal returns relative to a four factor model are shown for each portfolio, the difference portfolios, and the double difference portfolio. In all cases portfolio excess returns are regressed on excess market returns, SMB, HML and UMD from Ken French's website. In each row, the top number is the regression coefficient, the middle number in parentheses is the *t*-statistic, and the bottom number in brackets is the number of portfolio months. Panel A shows the returns to equal weighted portfolios, while Panel B shows the returns to value weighted portfolios. In each row, the top number is the regression coefficient, the middle number in parentheses is the *t*-statistic, and the bottom number in brackets is the number of portfolio months.. The data runs from September 1972 to October 2013. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

Panel A - Equal Weighted

Avg Increase in Turnover	All	Earnings Rank Level 1 (Low)	Earnings Rank Level 2 (High)	2 - 1
All		0.274 ***	0.445 ***	0.171 **
		(4.20)	(6.54)	(2.50)
		{482}	{482}	{482}
1 (turnover low this quarter)	0.481 ***	0.401 ***	0.633 ***	0.232 **
	(6.17)	(4.09)	(6.91)	(2.29)
	{425}	{425}	{425}	{425}
2 (turnover high this quarter)	0.344 ***	0.226 **	0.482 ***	0.256 **
	(4.45)	(2.39)	(5.18)	(2.45)
	{425}	{424}	{425}	{424}
	-0.137 *	-0.156	-0.151	0.003
2 -1	(-1.80)	(-1.57)	(-1.50)	(0.02)
	{425}	{424}	{425}	{424}

Panel B - Value Weighted

Avg Increase in Turnover	All	Earnings Rank Level 1 (Low)	Earnings Rank Level 2 (High)	2 - 1
All		0.303 ***	0.554 ***	0.251 *
		(3.14)	(5.01)	(1.84)
		{482}	{482}	{482}
1 (turnover low this quarter)	0.486 ***	0.344 **	0.586 ***	0.242
	(4.18)	(2.33)	(4.11)	(1.27)
	{425}	{425}	{425}	{425}
2 (turnover high this quarter)	0.368 ***	0.169	0.576 ***	0.416 **
	(2.89)	(1.34)	(3.70)	(2.11)
	{425}	{424}	{425}	{424}
	-0.118	-0.171	-0.009	0.170
2 -1	(-0.71)	(-0.90)	(-0.05)	(0.61)
	{425}	{424}	{425}	{424}

Table IX – Measures of Earnings Management, Earnings Seasonality and Abnormal Returns

This table presents the abnormal returns to portfolios sorted on both measures of earnings seasonality and various measures of actual or potential earnings management. For each stock with a quarterly earnings announcement 12 months ago, we rank earnings announcements from six years ago to one year ago by their earnings per share (adjusted for stock splits, etc.). The earnings rank variable is formed by taking the average rank of the 5 past announcements from the same fiscal quarter as that of the expected upcoming announcement. Stocks are sorted based on whether they are above or below the median earnings rank for that month. The second sorting variable is the measure of earnings management. In Panel A, firms are sorted to the previous level of accruals (roughly earnings in excess of cash flows). In Panel B, firms are sorted according to the governance measure 'G' used in Gompers, Ishii and Metrick (2003). In Panel C, firms are sorted based on the fraction of earnings announcements in the past year that beat the median analyst forecast by a penny or less. Abnormal returns relative to a four factor model are shown for each portfolio, the difference portfolios, and the double difference portfolio. In all cases portfolio excess returns are regressed on excess market returns, SMB, HML and UMD from Ken French's website. In each row, the top number is the regression coefficient, the middle number in parentheses is the *t*-statistic, and the bottom number in brackets is the number of portfolio months. Returns to equal weighted portfolios are shown on the left, and value-weighted portfolios are shown on the right. The data runs from September 1972 to October 2013. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

Panel A - Accruals

	Equal Weighted				**Value Weighted**			
		Earnings Rank Level				**Earnings Rank Level**		
Accruals	All	1 (Low)	2 (High)	2 - 1	All	1 (Low)	2 (High)	2 - 1
All		0.274 ***	0.445 ***	0.171 **		0.303 ***	0.554 ***	0.251 *
		(4.20)	(6.54)	(2.50)		(3.14)	(5.01)	(1.84)
		{482}	{482}	{482}		{482}	{482}	{482}
1 (low)	0.184 ***	0.350 ***	0.690 ***	0.340 ***	0.136 ***	0.377 ***	0.629 ***	0.252
	(4.35)	(4.53)	(7.88)	(3.78)	(3.08)	(2.98)	(4.20)	(1.33)
	{580}	{482}	{482}	{482}	{580}	{482}	{482}	{482}
2 (high)	-0.013	0.275 ***	0.315 ***	0.041	-0.043	0.206	0.559 ***	0.354 **
	(-0.28)	(3.36)	(3.96)	(0.41)	(-0.84)	(1.58)	(4.13)	(2.12)
	{580}	{482}	{482}	{482}	{580}	{482}	{482}	{482}
	-0.197 ***	-0.075	-0.375 ***	-0.300 **	-0.179 **	-0.171	-0.070	0.102
2 -1	(-4.22)	(-0.84)	(-4.03)	(-2.38)	(-2.35)	(-0.98)	(-0.38)	(0.42)
	{580}	{482}	{482}	{482}	{580}	{482}	{482}	{482}

Panel B - Frequency of Beating Analyst Forecast by One Penny or Less

Just Beating Forecast	Equal Weighted: Earnings Rank Level All	1 (Low)	2 (High)	2 - 1	Value Weighted: Earnings Rank Level All	1 (Low)	2 (High)	2 - 1
All		0.274 ***	0.445 ***	0.171 **		0.303 ***	0.554 ***	0.251 *
		(4.20)	(6.54)	(2.50)		(3.14)	(5.01)	(1.84)
		{482}	{482}	{482}		{482}	{482}	{482}
1 (Low Frequency)	-0.051	0.152	0.388 ***	0.253 *	-0.124 ***	0.123	0.268	0.155
	(-0.92)	(1.27)	(3.20)	(1.68)	(-2.70)	(0.68)	(1.48)	(0.63)
	{330}	{321}	{323}	{321}	{330}	{321}	{323}	{321}
2 (High Frequency)	0.276 ***	0.590 ***	0.806 ***	0.220 *	0.178 ***	0.584 ***	0.923 ***	0.372 *
	(3.89)	(5.01)	(7.00)	(1.65)	(3.75)	(3.81)	(5.08)	(1.73)
	{330}	{322}	{324}	{321}	{330}	{322}	{324}	{321}
2 -1	0.327 ***	0.412 ***	0.391 ***	0.003	0.302 ***	0.412 *	0.639 **	0.260
	(6.33)	(2.91)	(3.10)	(0.01)	(3.72)	(1.88)	(2.56)	(0.83)
	{330}	{320}	{321}	{320}	{330}	{320}	{321}	{320}

Panel C - Gompers, Ishii and Metrick Governance Measure

Governance	Equal Weighted: Earnings Rank Level All	1 (Low)	2 (High)	2 - 1	Value Weighted: Earnings Rank Level All	1 (Low)	2 (High)	2 - 1
All		0.274 ***	0.445 ***	0.171 **		0.303 ***	0.554 ***	0.251 *
		(4.20)	(6.54)	(2.50)		(3.14)	(5.01)	(1.84)
		{482}	{482}	{482}		{482}	{482}	{482}
1 (Low G, Good Governance)	0.189 ***	0.527 ***	0.789 ***	0.262	0.101 **	0.439 *	0.898 ***	0.459
	(2.62)	(3.63)	(5.56)	(1.54)	(2.15)	(1.87)	(3.27)	(1.32)
	{262}	{262}	{262}	{262}	{262}	{262}	{262}	{262}
2 (High G, Poor Governance)	0.136 *	0.343 **	0.677 ***	0.334 **	0.046	0.310 *	0.635 ***	0.325
	(1.74)	(2.55)	(5.09)	(2.27)	(0.91)	(1.84)	(4.18)	(1.54)
	{262}	{262}	{262}	{262}	{262}	{262}	{262}	{262}
2 -1	-0.053	-0.184	-0.112	0.072	-0.055	-0.130	-0.263	-0.133
	(-1.01)	(-1.13)	(-0.77)	(0.33)	(-0.71)	(-0.47)	(-0.88)	(-0.33)
	{262}	{262}	{262}	{262}	{262}	{262}	{262}	{262}

Table X – Earnings Seasonality Within Industries and Between Industries

This table presents the abnormal returns to portfolios formed on earnings seasonality, sorted according to distribution of seasonality within an industry and the average level of seasonality for that industry. For each stock with a quarterly earnings announcement 12 months ago, we rank earnings announcements from six years ago to one year ago by their earnings per share (adjusted for stock splits, etc.). The earnings rank variable is formed by taking the average rank of the 5 past announcements from the same fiscal quarter as that of the expected upcoming announcement. 'EW' and 'VW' refer to equal-weighted and value-weighted portfolios respectively. For columns marked 'Within Industry', stocks are sorted into quintiles according to the distribution of earnings rank within their industry, using the Fama and French (1997) 48 industry definitions. For columns marked 'Between Industries', we first calculate the average level of earnings rank for that industry that month (either equal-weighted or value-weighted, according to the specification). Next, we form portfolios of returns for that industry, also either equally weighted or value-weighted. Finally, we consider portfolios formed out of these industry portfolio returns, with the 48 industries being grouped into quintiles according to the distribution of the level of seasonality displayed by each industry. Abnormal returns under a four factor model are calculated by regressing portfolio excess returns on excess market returns, SMB, HML and UMD from Ken French's website. The data runs from September 1972 to October 2013. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

	Within Industry		Between Industries	
Seasonality Quintile	(VW) Intercept	(EW) Intercept	(VW) Intercept	(EW) Intercept
1 (Low)	0.339 ***	0.291 ***	0.248 *	-0.018
	(2.67)	(3.14)	(1.88)	(-0.15)
2	0.119	0.292 ***	0.211 *	0.225 **
	(0.88)	(3.33)	(1.74)	(2.23)
3	0.374 ***	0.269 ***	0.272 **	0.307 ***
	(2.71)	(3.11)	(2.47)	(3.24)
4	0.288 **	0.373 ***	0.191 *	0.328 ***
	(2.00)	(4.70)	(1.76)	(3.54)
5 (High)	0.835 ***	0.632 ***	0.546 ***	0.382 ***
	(6.01)	(7.20)	(4.47)	(3.28)
5 - 1	0.496 ***	0.342 ***	0.306 *	0.408 ***
	(2.98)	(3.17)	(1.84)	(2.66)

Table XI – Earnings Gap and Abnormal Returns

This table presents the abnormal returns to portfolios sorted on the average difference in earnings between the current fiscal quarter and other quarters (the earnings gap). The earnings gap measure takes the difference between the average earnings divided by price in the upcoming quarter (from the past 5 years) and the average earnings divided by price in other quarters over the same period. Stocks are sorted based on independent sorts of whether they are above or below the median earnings rank for that month and whether or not they are above the median earnings gap that month. Abnormal returns relative to a four factor model are shown for each portfolio, the difference portfolios, and the double difference portfolio. In all cases portfolio excess returns are regressed on excess market returns, SMB, HML and UMD from Ken French's website. The data runs from September 1972 to October 2013. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

Earnings Gap	(VW) Intercept	(EW) Intercept	MKTRF	SMB	HML	UMD	R2	N
1 (Low)	0.030	0.212 **	0.976 ***	0.764 ***	0.357 ***	-0.042 **	0.885	490
	(0.20)	(2.28)	(46.17)	(25.47)	(11.08)	(-2.03)		
2	0.278 **	0.256 ***	0.961 ***	0.546 ***	0.259 ***	-0.035 *	0.888	492
	(2.01)	(3.04)	(50.15)	(20.14)	(8.88)	(-1.88)		
3	0.391 ***	0.461 ***	0.960 ***	0.480 ***	0.173 ***	-0.030 *	0.901	492
	(3.50)	(5.94)	(54.42)	(19.21)	(6.44)	(-1.74)		
4	0.491 ***	0.449 ***	0.964 ***	0.604 ***	0.205 ***	-0.009	0.892	492
	(3.59)	(5.30)	(50.05)	(22.13)	(7.00)	(-0.49)		
5 (High)	0.801 ***	0.455 ***	1.024 ***	0.752 ***	0.377 ***	-0.038 *	0.872	492
	(4.85)	(4.48)	(44.36)	(23.01)	(10.74)	(-1.72)		
5 - 1	0.771 ***	0.227 *	0.050	-0.006	0.023	0.002	0.006	490
	(3.43)	(1.69)	(1.64)	(-0.13)	(0.50)	(0.08)		

Table XII – Earnings Seasonality by Calendar Quarter

This table presents the abnormal returns to portfolios formed on measures of earnings seasonality, computed separately for each quarter of the year. For each stock with a quarterly earnings announcement 12 months ago, we rank earnings announcements from six years ago to one year ago by their earnings per share (adjusted for stock splits, etc.). The earnings rank variable is formed by taking the average rank of the 5 past announcements from the same fiscal quarter as that of the expected upcoming announcement. We sort stocks each month into quintiles according to the distribution of earnings rank that month, with quintile 5 corresponding to stocks where the earnings were historically higher than normal in the upcoming quarter and quintile 1 corresponding to stocks with the earnings were historically lower than normal in the upcoming quarter. 'EW' and 'VW' refer to equal-weighted and value-weighted portfolios respectively. Abnormal returns under a four factor model are calculated by regressing portfolio excess returns on excess market returns, SMB, HML and UMD from Ken French's website. Regressions are run separately for data in each calendar quarter of the year, with '1' being returns in January, February or March, etc. The data runs from September 1972 to October 2013. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

	Equal Weighted			Value Weighted		
Quarter	Earnings Rank Quintile 1	Earnings Rank Quintile 5	Quintile 5 - Quintile 1	Earnings Rank Quintile 1	Earnings Rank Quintile 5	Quintile 5 - Quintile 1
1	0.141	0.728 ***	0.586 ***	-0.080	1.033 ***	1.112 ***
	(0.82)	(3.94)	(3.27)	(-0.39)	(3.75)	(4.10)
2	0.512 ***	0.666 ***	0.154	0.761 ***	1.045 ***	0.284
	(3.39)	(3.88)	(0.78)	(3.21)	(3.05)	(0.79)
3	0.166	0.523 ***	0.356 *	0.482	0.721 ***	0.240
	(0.94)	(3.26)	(1.73)	(1.42)	(2.69)	(0.64)
4	0.156	0.573 ***	0.382	0.369 *	0.563 **	0.189
	(0.92)	(3.16)	(1.56)	(1.69)	(2.37)	(0.59)