Investor Inattention and Friday Earnings Announcements*

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Abstract

Does limited attention among investors affect stock prices? We compare the response of stock returns to earnings announcements on Friday, when investors are more likely to be inattentive, and on other weekdays. If inattention is a determinant of stock prices, we should observe less immediate response and more drift for Friday announcements. Indeed, Friday announcements have 20 percent lower immediate response and 60 percent higher delayed stock return response. The delayed response as a percentage of the total response is 60 percent on Friday and 40 percent on other weekdays. These differences are statistically and economically significant. A portfolio that invests in the differential Friday drift earns substantial abnormal returns. In addition, abnormal trading volume around announcement day is 10 percent lower for Friday announcements. The findings about returns and volume suggest that weekends distract investors temporarily. They support explanations of post-earnings announcement drift based on underreaction to information caused by limited attention. These results also provide an explanation for the well-known fact that firms release worse announcements on Friday.

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1 Introduction

Investors have a limited amount of time and cognitive resources to process information. Despite the intuitive appeal of limited attention, little evidence exists on the extent to which the quality of decision-making by investors declines in response to distractions. Incentives, information aggregation across investors, and arbitrageurs may eliminate the effects of limited attention.

We examine a decision where attention to new information plays a crucial role, the response to earnings surprises. We compare announcements that occur just before the weekend, on Friday, to announcements on other weekdays. If weekends distract investors and lower the quality of decision-making, the immediate response to Friday earnings surprises should be less pronounced. As investors revisit their decisions in subsequent periods, the information should eventually be incorporated in stock prices. As a result, the delayed response, measured by the post-earnings announcement drift, should be of greater magnitude for Friday announcements. If limited attention, instead, does not affect stock prices, the response to announcements should not differ for Friday and non-Friday announcements.

This paper, therefore, addresses the debate on the explanation for the post-earnings announcement drift (Chan, Jegadeesh, and Lakonishok, 1996; Bernard and Thomas, 1989). Behavioral explanations depend on disposition effect (Grinblatt and Han, forthcoming; Frazzini, 2006), fluctuations in overconfidence (Daniel, Hirshleifer, and Subrahmanyam, 1998), beliefs about mean reversion (Barberis, Shleifer, and Vishny, 1998), or underreaction to information due to cognitive limits (Hong and Stein, 1999). Of the explanations in the literature, only underreaction to information makes the prediction that distractions increase the drift.

The paper proceeds as follows. In Section 2 we present a model of the response of stock prices to signals about earnings. In each period, a share of the agents is distracted and does not observe a signal regarding company performance. Given limits to arbitrage in the form of risk aversion, the distracted agents affect prices. A larger share of inattentive investors shrinks the immediate response and magnifies the delayed response of prices to the signals. Distraction, therefore, increases the post-earnings announcement drift. The combined response to the announcement, however, is not affected by the distracted investors. We also show that companies that maximize short-term share value release bad news on high-distraction days.

In Section 3, we characterize our sample of earnings announcements from January 1995 until June 2004. Since we analyze the difference between Friday and non-Friday announcements, the accuracy of the announcement date is critical. We devise a rule, based on newswire announcement dates, that identifies the correct announcement date from I/B/E/S and Compustat data with more than 95 percent accuracy. This rule can be used to improve the accuracy of the I/B/E/S announcement date for the period 1984-2004.

In Section 4, we evaluate the immediate, delayed, and long-term stock response to information by comparing the top and bottom quantile of the earnings surprise. The immediate stock response is 15 percent lower for Friday announcements than for non-Friday announcements. We find a similar attenuation using non-linear regressions for the whole sample. Conversely, the delayed response is 60 percent larger for Friday announcements. The combined long-term reaction is similar for Friday and non-Friday announcements.

We combine these findings in a summary measure that is displayed in Figure 2. The delayed response as a percentage of the total response is 60 percent on Friday and 40 percent on other weekdays. According to the model, this implies that the share of distracted agents in the economy is at least 60 percent on Friday and 40 percent on other days.

We construct a portfolio to measure the differential post-earnings-announcement drift for Friday announcements. A trading strategy which purchases (long position) the Friday drift and sells (short position) the non-Friday drift earns abnormal returns in excess of 4 percentage points per month.

These findings are consistent with weekend distractions altering the investor response to earnings information. Individuals are more likely to underreact initially to Friday announcements. Eventually, investors become aware of the information they neglected and trade accordingly. The stronger delayed response (larger drift) reverses the initial underreaction.

If investors are more distracted on Friday, we also expect lower abnormal trading volume for Friday announcements. In Section 5, we find that the abnormal volume is indeed 10 to 20 percent lower for Friday announcements than for non-Friday announcements.

The stock return and volume results suggest that investors exhibit a lower immediate response to Friday announcements. Managers that maximize short-term value should respond by releasing worse announcements on Friday. The results in this paper, therefore, provide an explanation for the known findings of worse earning (and dividend) announcements on Friday (Penman, 1987; Damodaran, 1989; Bagnoli, Clement, and Watts, 2005).

In Section 6 we consider alternative interpretations of the findings. First, the slower response to Friday announcements may be due to mechanical differences between Friday and non-Friday announcements due to the extended trading stoppage or to a larger share of announcements made after the market is closed. However, the two-day break after Friday announcements should allow investors more time to respond and thereby reduce the underreaction. Moreover, during the sample period Friday announcements are *less* likely to be released after the market closes. Second, the slower response to Friday announcements may be caused by pre-announcement leakage of information. However, the stock returns during the 30 days before the announcement do not differ systematically for Friday and non-Friday announcements after conditioning on earnings news. Third, the slower response to Friday announcements could be due to systematic differences in the characteristics of companies announcing on Friday. While it is impossible to fully control for company heterogeneity, the results are robust to the introduction of time, market capitalization, and earnings surprise volatility controls.

The results in this paper are related to the literature on inattention in finance (Barber and Odean, forthcoming; Barberis, Shleifer, and Vishny 1998; Daniel, Hirshleifer, and Subrahmanyam, 1998; DellaVigna and Pollet, 2005a; Dyck and Zingales, 2003; Hirshleifer and Teoh, 2003; Hong and Stein, 1999; Huberman and Regev, 2001; Peng and Xiong, 2006) and economics (Gabaix et al., 2006). From this standpoint, our key finding is that a distracting event increases the delayed reaction of stock prices to new information. This result supports the theory that momentum effects (Jegadeesh and Titman 1993) and post-earnings announcement drift (Chan, Jegadeesh, and Lakonishok, 1996; Bernard and Thomas, 1989) are caused by underreaction to new information due to cognitive constraints. In a related paper, Hirshleifer, Lim, and Teoh (2006) show that the response of stock prices to earnings news is delayed on days with more earnings announcements, a proxy of distraction. The evidence in our paper about the speed of information assimilation by weekday differs from the previous evidence on aggregate return and trading volume by weekday (French, 1980; Keim and Stambaugh, 1984).

Finally, this paper is an additional example of a market response to a bias, in this case investor inattention. This is a long-standing theme in finance (Baker, Ruback, and Wurgler, forthcoming; DeLong et al., 1990; Shleifer, 2000) and it has more recently been applied to firm pricing (DellaVigna and Malmendier, 2004; Gabaix and Laibson, 2006).

2 Model

We present a model of portfolio choice where all investors are exposed to a signal about next period's dividend, but the fraction of investors that pay attention to this signal varies by weekday. We use the noise trader framework (DeLong et. al., 1990) and allow managers to respond to investor inattention as in Hirshleifer and Teoh (2003). The model differs from Hirshleifer and Teoh because managers cannot manipulate the signal itself. Instead, managers select the fraction of distracted investors by choosing the announcement date.

Setup. There is a continuum of investors on the interval [0,1] where a fraction $1-\mu_t$ of investors observes the signal s_t and a fraction μ_t of investors does not. The manager releases news on low-attention days ($\mu_t = \mu_l$) or high-attention days ($\mu_t = \mu_h$), where $0 \leq \mu_l \leq \mu_h \leq 1$. The model analyzes an overlapping generations framework where the time interval for each period is a quarter of a year. Before the start of period t, the manager chooses to announce a signal s_t about the next dividend when the share of distracted investors is either high or low. At the start of period t, investors choose the amount of wealth to be invested in both the risky and riskless assets. Attentive investors use the signal s_t to make this decision, while distracted investors do not. The equilibrium price P_t is determined by aggregating demand for the risky asset. At the end of period t, the risk regarding the dividend D_{t+1} is resolved and this dividend is paid to both types of investors. All wealth is then consumed.

Portfolio choice. At the beginning of quarter t, agent i invests λ_t^i units in the risky asset in order to maximize end-of-period wealth W_t^i. The risky asset has price P_t, pays a risky dividend D_{t+1} before the start of period $t+1$, and is in fixed supply. The dividend D_{t+1} is equal to $\delta + s_t + \varepsilon_{t+1}$ where $s_t \sim N(0, \sigma_s^2)$ is the signal broadcast to the public before the start of period t and $\varepsilon_{t+1} \sim N(0, \sigma_\varepsilon^2)$ is the random component that is unknown until the end of period t. We assume that s_t and ε_t are contemporaneously independent and are drawn identically and independently across periods. The riskless asset has a price normalized to 1, a gross return of $1+R$ every period, and is in perfectly elastic supply. We define $E_t^i[.]$ and $\sigma^2_{i,t,(.)}$ as the conditional expectation and variance operators respectively using the information available to individual i. For example, the expected dividend for attentive investors (where $i > \mu_t$) is denoted $E_t^i[D_{t+1}] = E_t^{1-\mu}[D_{t+1}] = \delta + s_t$ and the expected dividend for distracted investors (where $i \leq \mu_t$) is denoted $E_t^i[D_{t+1}] = E_t^{\mu}[D_{t+1}] = \delta$. Each investor has a quadratic utility function with risk aversion parameter $\gamma > 0$. The i^{th} individual solves

$$\begin{aligned} &\max_{\lambda_t^i} \; E_t^i[W_{t+1}^i] - \frac{\gamma}{2} Var_t^i[W_{t+1}^i] \\ s.t.\; W_{t+1}^i &= \lambda_t^i (P_{t+1} + D_{t+1} - P_t) + (W_t^i - \lambda_t^i P_t)R + W_t^i. \end{aligned}$$

Hence, the demand for the risky asset is

$$\lambda_t^i = \frac{E_t^i[P_{t+1} + D_{t+1}] - P_t(1+R)}{\gamma \sigma^2_{i,t,P+D}}. \tag{1}$$

Equilibrium. We impose the market clearing and transversality conditions to solve for the equilibrium price.

$$P_t = \frac{\delta - \bar{a}}{R(1+R)} + \frac{\delta - a_t}{1+R} + \frac{1-b_t}{1+R} s_t, \tag{2}$$

where $a_t = [\mu_t/(\gamma\sigma^2_{\mu,t,P+D}) + (1-\mu_t)/(\gamma\sigma^2_{1-\mu,t,P+D})]^{-1}$, $b_t = \mu_t/(\gamma\sigma^2_{\mu,t,P+D})a_t$, $\bar{a} = \eta a(\mu_h) + (1-\eta)\, a(\mu_l)$, and $\eta = prob(\mu_{t+s} = \mu_h)$. Since b_t increases with the fraction of distracted agents, inattention makes prices less responsive to signals.

Response to signal. We derive measures of the immediate and the delayed response of the stock price to the signal. Define the dollar excess return from $t-1$ to t as $Z_t = P_t + D_t - (1+R)P_{t-1}$. The abnormal return from $t-1$ to t is the change in expected returns due to new information. This abnormal return incorporates two sources of new information: the signal s_t and the unexpected dividend $D_t - E_{t-1}[D_t]$. Since the second component is unrelated to the signal, we define the immediate response to the signal as $E_t[IR_t] \equiv Z_t - E_{t-1}[Z_t] - (D_t - E_{t-1}[D_t])$.

The excess return for the second period (t to $t+1$) is Z_{t+1}. The change in the expectation for this excess return caused by the signal is $E_t[DR_{t+1}] \equiv E_t[Z_{t+1}] - E_{t-1}[Z_{t+1}]$. This measure captures the delayed response and is the theoretical equivalent of the post-earnings announcement drift. We also define the long-term response to the announcement $E_t[LR_{t+1}]$ as the discounted sum of $E_t[IR_t]$ and $E_t[DR_{t+1}]$.

Proposition 1. *(i) The immediate response* $E_t[IR_t]$ *is a linear function of the signal* s_t*, with slope coefficient* $(1-b_t)/(1+R)$*. The slope* $(1-b_t)/(1+R)$ *is decreasing in the share of distracted investors* μ_t *and is equal to* $1/(1+R)$ *if* $\mu_t = 0$*. (ii) The delayed response* $E_t[DR_{t+1}]$ *is a linear function of the signal* s_t*, with slope coefficient* b_t*. The slope* b_t *is increasing in the share of distracted investors* μ_t *and is equal to zero if* $\mu_t = 0$*. (iii) The long-term response* $E_t[LR_{t+1}]$ *is a linear function of the signal* s_t*, with slope coefficient* $1/(1+R)$*. The slope* $1/(1+R)$ *is independent of the share of distracted investors* μ_t*.*

A larger fraction of distracted agents lowers the immediate response and increases the delayed response. The long-term response, however, does not depend on the share of inattentive investors. We consider a summary measure for the delayed incorporation of news into stock prices. Let s_A and s_B be signals of different quality where $s_A > s_B$. We define the delayed response ratio as the ratio of the differential delayed response to the differential long-term response: $DRR_t = (E[DR_t|s_A, \mu_t] - E[DR_t|s_B, \mu_t]) / (E[LR_t|s_A, \mu_t] - E[LR_t|s_B, \mu_t])$.

Corollary 1. *(i) The delayed response ratio* DRR_t *equals* $b_t(1+R)$*. (ii)* DRR_t *is increasing in the share of distracted investors* μ_t *and is equal to zero if* $\mu_t = 0$*. (iii)* DRR_t *provides a bound on the share of distracted investors:* $\mu_t \geq DRR_t$*.*

On high-distraction days a greater fraction of the long-term response is delayed. If there are no distracted investors, the delayed response ratio is zero. We use the bound $\mu_t \geq (1+R)\, DRR_t$ in Section 4.

Manager optimization. The manager of the firm can announce the signal on a high-distraction ($\mu_t = \mu_h$) or a low-distraction day ($\mu_t = \mu_l$). Long-term managers maximize the expected long-term price $E_t[P_{t+1}]$ and short-term managers maximize the current price $E_t[P_t] = P_t$. We also consider managers that commit ex ante to always release the signal on a high-distraction day or on a low-distraction day.

Proposition 2. *(i) Managers that maximize long-term value are indifferent between* μ_l and μ_h*. (ii) Managers that maximize short-term value choose* $\mu_t = \mu_h$ *whenever* $s_t \leq -\sigma_s^2\gamma$*. It follows that* $E[s_t|\mu_t = \mu_h] < E[s_t|\mu_t = \mu_l]$ *and* $E[IR_t|\mu_t = \mu_h] < E[IR_t|\mu_t = \mu_l]$*. (iii) Managers that commit to a simple announcement strategy always choose* $\mu_t = \mu_l$*.*

Since the long-term price is independent of the release decision, long-term managers are indifferent between $\mu_t = \mu_l$ and $\mu_t = \mu_h$.Short-term managers release on high-distraction days whenever the signal is sufficiently negative. This threshold rule implies that the average signal s_t released on high-distraction days is worse than the average signal s_t released on low-distraction days. Therefore, the average immediate response IR_t is lower on high-distraction days. Managers that commit to a simple announcement strategy always announce on low-distraction days in order to minimize the risk premium. Proposition 2(ii) indicates that inattention is an explanation for the known finding that earnings and returns surrounding earnings announcements are lower for Friday announcements than for announcements on other days (Penman, 1987; Damodaran, 1989; Bagnoli, Clement, and Watts, 2005).

3 Data and summary statistics

Data. Our sources of earnings data are I/B/E/S and Compustat. We use the quarterly earnings announcements from I/B/E/S for which at least one analyst forms an earnings forecast in the 90 days before the announcement. We restrict the sample to announcements that have stock return data in CRSP and are reported in both I/B/E/S and Compustat with a difference of at most 5 calendar days between the reported announcement dates. The resulting sample includes 202,933 announcements during the period January 1984-June 2004.

We construct a measure of the announcement date using the reported Compustat and I/B/E/S dates. In order to quantify the accuracy of these dates, we randomly select 2,601 earnings announcements for the period 1984 to 2003 and use Lexis-Nexis to search the announcement date in the PR newswires. We look for the function of the Compustat and I/B/E/S dates that matches the newswire date most accurately. We oversample announcements that occur on Friday according to I/B/E/S. The results of the search (available upon request) suggest that the optimal imputation rule for the date differs for three categories of announcements:

1. I/B/E/S and Compustat announcement dates differ. In the case of disagreement, the earlier date is usually the actual date of the announcement, and the later date is the date of publication in the *Wall Street Journal*. We impute the date to be the earlier one.

2. Before January 1, 1990: I/B/E/S and Compustat announcement dates agree. In this case, most announcements are recorded using the Wall Street Journal date in both data sets. We assign the announcement date to be the previous trading date.

3. After January 1, 1990: I/B/E/S and Compustat announcement dates agree. During this time period, the announcement date is usually from a newswire source. We impute the date to be the I/B/E/S and Compustat date.

After applying these rules, we measure the accuracy of the imputed announcement date (Appendix Table I) for Friday and non-Friday announcements. Before 1995, a high number of earnings announcements were recorded with an error of at least one trading day. In addition, the errors are more common for Friday announcements than for non-Friday announcements. During the more recent years, the accuracy of the earnings date has increased substantially, and is almost perfect after December 1994. For the purposes of this paper, even a one-day error in the date is important, since it would lead to a misclassification of Friday announcements. In light of this evidence, we limit the analysis to the 127,099 earnings announcements taking place after 1994. In this period, the imputed earnings announcement date is correct more than 95 percent of the time for both Friday and non-Friday announcements.

As a measure of investor expectation, we use the consensus analyst forecast from I/B/E/S. The consensus forecast is defined as the median forecast among all the analysts that make a forecast in the last 30 calendar days before the earning announcement. If an analyst has made multiple forecasts in this time horizon, we use only the most recent one.[1]

We define the earnings surprise as the difference between the earnings announcement and the consensus earnings forecast, normalized by the price of a share (Kothari, 2001). Let $e_{t,k}$ be the earnings per share announced in quarter t for company k and $\hat{e}_{t,k}$ be the corresponding consensus analyst forecast[2]. Further, indicate by $P_{t,k}$ the price of the shares of company k five trading days before the announcement in quarter t. The earnings surprise $s_{t,k}$ is

$$s_{t,k} = \frac{e_{t,k} - \hat{e}_{t,k}}{P_{t,k}}. \tag{3}$$

We match the announcement dates with information on stock returns and trading volume from CRSP. We construct cumulative abnormal returns for different windows around the announcement date. Define $R_{\tau,k}$ the stock return of company k on day τ and $R_{\tau,m}$ the market stock return on day τ. We obtain $\hat{\beta}$ for company k in quarter t from the regression $R_{u,k} = \alpha_{t,k} + \beta_{t,k} R_{u,m}$ for days u from $\tau - 300$ to $\tau - 46$, where τ is the date of the announcement in quarter t. The buy-and-hold abnormal return $R_{t,k}^{(h,H)}$ over time period $(\tau + h, \tau + H)$ for stock k in quarter t is then computed as $[\Pi_{j=\tau+h}^{\tau+H}(1 + R_{j,k})] - 1 - \hat{\beta}_{t,k}[\Pi_{j=\tau+h}^{\tau+H}(1 + R_{j,m}) - 1]$.[3]

We drop observations with a missing earnings surprise (5,718 observations), or in which the earnings announcement $e_{t,k}$ or the earnings forecast $\hat{e}_{t,k}$ are larger in absolute value than the price of a share $P_{t,k}$ (173 observations). We also eliminate penny stocks (748 observations) as well as announcements on Saturday, Sunday, or holidays (228 observations). Finally, we exclude observations with returns in the top and bottom 1/10,000th of the distributions for $R_{t,k}^{(0,1)}$ or $R_{t,k}^{(2,75)}$ (50 observations). The final sample includes 121,381 observations.

Summary statistics. More than 80 percent of announcements occur on Tuesday, Wednesday, or Thursday, 14.0 percent occur on Monday and only 5.7 percent are on Friday (Table IA). The model can explain the small share of announcements on Friday—firms that commit to an announcement schedule never commit to announcements on a high-inattention day (Friday).

In Table IB we present summary statistics for the 6,987 Friday announcements (Column 1), and for the 114,394 non-Friday announcements (Column 2). Firms announcing on Friday have 26 percent smaller market capitalization. Friday announcements are more prevalent toward

[1]The results are similar if we use the average forecast as a measure of consensus forecast or if we use analyst forecasts over a shorter (15 days) horizon.

[2]The measure of earnings per share in I/B/E/S reflects capital structure changes. In order to make the units of the earning announcements and forecasts comparable with the units of the price data $P_{t,k}$, we apply the adjustment provided by I/B/E/S. Since the adjustment factor is stored as a truncated number, the resulting variables $e_{t,k}$ and $\hat{e}_{t,k}$ have fractional cents. We round the earning per share measure $e_{t,k}$ to the nearest cent and the earnings forecast $\hat{e}_{t,k}$ to the nearest half cent.

[3]The results in the paper are similar if we use raw returns or net returns.

the beginning of the sample period. In general, 62.33 percent of announcements occur in the first month of the quarter (January, April, July, and October), 29.49 in the second month, and only 8.19 percent in the third month. Friday announcements are more likely to occur in the second or third month.

We include measures of corporate governance for a subset of firms. To the extent that poor governance is correlated with short-term value maximization, we expect Friday announcements to be more likely for poorly-governed firms. Indeed, firms making Friday announcements are less likely to have a block-shareholder (Cremers and Nair, forthcoming), and more likely to have poor governance (Gompers et al., 2003), although the latter difference is not significant.

Columns 4 and 5 present the summary statistics for companies with 10 to 90 percent of their announcements on Friday. This criterion excludes companies that rarely announce on Friday (97,381 observations) or that almost always announce on Friday (178 observations). In the remaining sample of 23,822 announcements, the summary statistics for announcements on Friday (Column 4) and other weekdays (Column 5) are substantially closer. The controls for month and market capitalization are no longer significantly different, and the difference in the average year of announcement is reduced to less than three months. This subsample, labelled *Homogeneous Sample*, addresses to some extent the concern that companies announcing on Friday may have unobservable features that differ from companies announcing on other days.

4 Stock return response

In this Section, we examine the responsiveness of stock returns to earnings surprises at various horizons. We compare the responsiveness for announcements on Friday to the responsiveness for announcements on other weekdays. If the fraction of distracted investors is higher on Friday, there should be less immediate response to Friday announcements, followed by more delayed response; the total long-term response should be unchanged (Proposition 1). The fraction of the stock reaction occurring with delay should be higher for Friday announcements (Corollary 1). We present graphical evidence, followed by an analysis of top and bottom earnings quantiles including delayed response ratios, and by non-linear regressions. Finally, we analyze the portfolio returns for a strategy that exploits the difference in drift between announcements on Friday and other weekdays.

4.1 Graphical evidence

To measure announcement quality, we divide announcements into 11 bins, ordered by the earnings surprise $s_{t,k}$. Negative earning surprises are in Quantiles 1 through 5, followed by zero surprises (Quantile 6), and positive surprises (Quantiles 7 though 11). The thresholds for the bins are set separately for each year to guarantee an equal number of non-Friday announcements for bins 1 through 5 and for bins 7 through 11. Since positive surprises are twice as common as negative surprises, bins 7-11 have twice as many observations as bins 1-5. Within each bin, we separate the Friday announcements from the non-Friday announcements.[4]

The Panel at the bottom of Figure 1e reports the average earnings surprise $s_{t,k}$ within each quantile for the Friday and the non-Friday announcements. The within-quantile average earnings surprise is very similar for Friday and non-Friday announcements. The only exception is Quantile 1, where the average surprise for Friday announcements is ten percent lower than for non-Friday announcements.

Immediate response. In Figure 1a we display the immediate response of stock returns, $R_{t,k}^{(0,1)}$, to earnings surprises for Friday and non-Friday announcements. By construction, $R_{t,k}^{(0,1)}$ is the return from the close on the trading day before the earnings announcement to the close on the trading day after the earnings announcement for stock k in quarter t. This measure captures the short-term response to announcements made during trading hours and announcements made after the market is closed.[5] Compared to announcements on other days, the responsiveness of stock prices to earning surprises is substantially flatter for Friday announcements. Interestingly, most of the underreaction occurs for positive announcements: companies with positive announcements on Friday are significantly penalized initially. However, even for negative announcements there is less initial reaction on Friday: stock returns for quantiles 1 through 5 are less negative for Friday than for non-Friday announcements.

Delayed response. In Figure 1b we display the delayed reaction of stock returns, $R_{t,k}^{(2,75)}$, to the earnings announcements. In the non-Friday sample, positive earnings surprises are followed by positive returns in the period subsequent to the announcement, and the pattern is increasing in the magnitude of the surprise. Negative surprises are followed by negative delayed returns, but the magnitudes are smaller. In the Friday sample, the delayed response to positive surprises follows a similar pattern to the one in the non-Friday sample. In addition, there are large negative returns for the most negative surprises. Considering both positive and negative surprises, Friday announcements exhibit more delayed response.

Long-term response. In Figure 1c we display the total response of stock return, $R_{t,k}^{(0,75)}$, to earnings surprises. The response is similar for announcements on Friday and other weekdays.

[4]This procedure has advantages compared to the typical decile procedure. Since 10 to 25 percent of announcements display no surprise relative to the forecast, some of the deciles are empty and others twice as large as normal. Since the share of positive and negative announcements varies from year to year, this procedure generates an irregular distribution of announcements across deciles. Nevertheless, in Section 4.5 we present a specification using the decile methodology.

[5]Since the time stamp for each announcement is not available in I/B/E/S or Compustat, we cannot separate announcements made during trading hours from those made after close.

4.2 Top and bottom quantiles

To quantify the graphical findings, we examine the stock response to very positive earnings news (top quantile) and very negative news (bottom quantile). We compare the immediate, delayed, and long-term sensitivity for Friday and non-Friday announcements. The OLS specification is

$$R_{t,k}^{(h,H)} = \phi_B + \phi_{T-B} d_{t,k}^{top} + \phi_B^F d_{t,k}^F + \phi_{T-B}^F d_{t,k}^{top} d_{t,k}^F + \Gamma_0 X_{t,k} + \Gamma_1 d_{t,k}^{top} X_{t,k} + \varepsilon_{t,k}, \qquad (4)$$

where $R_{t,k}^{(h,H)}$ denotes the abnormal stock returns for company k in quarter t between h days before the announcement and H days after the announcement. The sample includes only observations in the top quantile(s) ($d_{t,k}^{top} = 1$) or the bottom quantile(s) ($d_{t,k}^{top} = 0$). We focus on the coefficients ϕ_{T-B} and ϕ_{T-B}^F. The coefficient ϕ_{T-B} measures the return to good news (top quantile) relative to bad news (bottom quantile) for non-Friday announcements. The coefficient ϕ_{T-B}^F captures the differential reaction for Friday relative to non-Friday announcements. Under the null hypothesis of constant (or no) investor distraction, ϕ_{T-B}^F should equal zero. Under the alternative hypothesis of higher distraction on Friday, ϕ_{T-B}^F should be negative for the immediate response ($R_{t,k}^{(0,1)}$) and positive for the delayed response ($R_{t,k}^{(2,75)}$). Distracted investors react less to news initially, and more afterwards.

Specification (4) allows the stock response to depend on a set of control variables $X_{t,k}$. For example, the responsiveness of stocks to earnings news may be correlated with company size if profit shocks are more permanent for larger firms. Similarly, the responsiveness may have increased with time if earnings disclosure regulation decreased the pre-announcement leakage of information. We include indicators for year of announcement, as well as 10 step functions for market capitalization. The indicators for market capitalization are constructed from $\log(p_{t,k} n_{t,k}) - \sum_{k=1}^{K} \log(p_{t,k} n_{t,k})/K$, that is, log market capitalization for company k in quarter t minus the average market capitalization for other companies making announcements in the same quarter. We also include month indicators to control for differences in return sensitivity across quarters and within a quarter (early versus late releases). Finally, in some specifications we also control for earnings surprise volatility. Each year, we sort announcements into deciles using the company's earnings surprise standard deviation during the previous 4 years, requiring a minimum of 4 observations. Each control (if included) is also interacted with the indicator variable for the top quantile (or top two quantiles). Standard errors are clustered by day of announcement to control for correlation of returns on the same day.

Immediate response. Table IIA presents specification (4) with the immediate stock return $R_{t,k}^{(0,1)}$ as dependent variable. Without controls (Column 1), the top-to-bottom average return for non-Friday announcements is 6.59 percent ($\hat{\phi}_{T-B} = .0659$). Compared to this value, the top-to-bottom return for a Friday announcement is significantly smaller by 1.23 percentage points ($\hat{\phi}_{T-B}^F = -.0123$), an 18.6 percent ($\hat{\phi}_{T-B}^F / \hat{\phi}_{T-B} = -.0123/.0659$) reduction.

The top-minus-bottom return differential for Friday announcements is marginally significant with the standard set of controls ($\hat{\phi}_{T-B}^F = -.0095$, Column 2), and significant with additional controls for earnings surprise volatility ($\hat{\phi}^F_{T-B} = -.0130$, Column 3). In the smaller Homogeneous Sample (5,057 observations, Column 4), the coefficient ϕ^F_{T-B} is still negative ($\hat{\phi}^F_{T-B} = -.0055$), but not significant.

In Columns 5 and 6 we replicate specification (4) on the observations in the top 2 and bottom 2 quantiles. (The variable $d^{top}_{t,k}$ is now an indicator for the top 2 quantiles.) The larger sample increases the precision of the estimates. The top-to-bottom return differential for non-Friday announcements is 5.78 percent ($\hat{\phi}_{T-B} = .0578$). Relative to this differential, Friday announcements are associated with a 18.8 percent (0.0109/0.0578) lower immediate return response, an economically and statistically significant difference. The Friday effect is still significant with controls (Column 6).

Delayed response. In Table IIB we estimate specification (4) with the delayed abnormal stock performance $R^{(2,75)}_{t,k}$ as dependent variable[6]. In the specification without controls (Column 1), the estimated post-earnings-announcement drift for non-Friday announcements, $\hat{\phi}_{T-B}$, is 5.50 percent. This magnitude is consistent with previous estimates (Bernard and Thomas, 1990). The drift for Friday announcements is significantly bigger by 3.80 percentage points ($\hat{\phi}^F_{T-B} = .0380$), that is, is 69.1 percent larger than on other weekdays. The coefficient $\hat{\phi}^F_{T-B}$ is marginally significant with controls (Columns 2 and 3) and significant in the Homogeneous Sample (Column 4). In this latter sample, the Friday drift is 124.6 percent larger than on other weekdays. Finally, the estimates using announcements in the top 2 and bottom 2 quantiles (Columns 5-6) resemble the estimates obtained using only the top and bottom quantile.

Long-term response. In Table IIC we measure the impact on long-term returns $R^{(0,75)}_{t,k}$. For the six specifications used in Tables IIA and IIB, the top-bottom return differential on non-Fridays varies from 12.56 percent ($\hat{\phi}_{T-B} = .1256$, Column 1) to 10.48 percent ($\hat{\phi}_{T-B} = .1048$, Column 4). For these specifications, the top-to-bottom differential response on Fridays $\hat{\phi}^F_{T-B}$ is positive, but not significantly so (except for a marginal significance in Column 4). Long-term stock returns are similar for Friday and non-Friday announcements.

Summary. Stock prices respond less to Friday earnings surprises than to non-Friday earnings surprises in the immediate period (0,1), though this effect is not significant in the Homogeneous Sample. In the later period (2,75), stock prices respond *more* to Friday earning surprises. Summing these two effects in the event window (0,75), there is no significant differential long-term effect of Friday announcements. These patterns are consistent with the predictions of the model if more investors are inattentive to the information released on Friday. For Friday announcements, inattention leads to less initial response, followed by more delayed response, as investors become aware of the neglected information.

[6]The results are similar if we use alternative horizons such as (2,60), or (2,90). The horizon (2,75) is the shortest period that typically includes the next earnings announcement.

4.3 Delayed response ratio

We implement a unified test of the model, suggested by Corollary 1[7], in Table IID and Figure 2. We compute the share of the total stock response to announcements ($R_{t,k}^{(0,75)}$) that occurs with delay ($R_{t,k}^{(2,75)}$). We then test whether the delayed response ratio (DRR) is higher for Friday announcements. There are two advantages of this methodology: (i) it controls for heterogeneity in the long-term reaction for Friday and non-Friday announcements by renormalizing with the long-term reaction; (ii) it offers an easily interpretable measure of the delay that provides a lower bound on the share of inattentive agents.

We compute numerator and denominator of DRR as the difference in the average cumulative abnormal returns between the top and bottom quantile. The measure for non-Friday announcements is

$$DRR^{NF} = \frac{E[R_{k,t}^{(2,75)}|d_{t,k}^{top}=1, d_{t,k}^{F}=0] - E[R_{k,t}^{(2,75)}|d_{t,k}^{top}=0, d_{t,k}^{F}=0]}{E[R_{k,t}^{(0,75)}|d_{t,k}^{top}=1, d_{t,k}^{F}=0] - E[R_{k,t}^{(0,75)}|d_{t,k}^{top}=0, d_{t,k}^{F}=0]} = \frac{\phi_{T-B}^{(2,75)}}{\phi_{T-B}^{(0,75)}} \tag{5}$$

where $\phi_{T-B}^{(2,75)}$ is the coefficient ϕ_{T-B} estimated in (4) with $R_{k,t}^{(2,75)}$ as dependent variable (and similarly for $\phi_{T-B}^{(0,75)}$) (Tables IIB and IIC). The standard errors are derived using the Delta method. In the specification without controls (Column 1), 43.80 percent of the top-to-bottom stock response is delayed. The results are remarkably similar with controls (Columns 2 and 3)[8], in the Homogeneous Sample (Column 4), and using the top 2 and bottom 2 quantiles (Columns 5-6). For these different specifications, the average DRR lies between .35 and .44.

Similarly, we compute the delayed response ratio for Friday announcements:

$$DRR^{F} = \frac{E[R_{k,t}^{(2,75)}|d_{t,k}^{top}=1, d_{t,k}^{F}=1] - E[R_{k,t}^{(2,75)}|d_{t,k}^{top}=0, d_{t,k}^{F}=1]}{E[R_{k,t}^{(0,75)}|d_{t,k}^{top}=1, d_{t,k}^{F}=1] - E[R_{k,t}^{(0,75)}|d_{t,k}^{top}=0, d_{t,k}^{F}=1]} = \frac{\phi_{T-B}^{(2,75)} + \phi_{T-B}^{F(2,75)}}{\phi_{T-B}^{(0,75)} + \phi_{T-B}^{F(2,75)}}. \tag{6}$$

In the benchmark specification (Column 1), 62.87 percent of the top-to-bottom response on Friday occurs with delay ($DRR^F = .6287$). Compared to the delayed response ratio of .4380 on other weekdays, Fridays have an additional 19 percentage points of delayed reaction, an economically and statistically significant difference. The controls (Columns 2 and 3), the Homogeneous Sample (Column 4), and the top 2 and bottom 2 quantiles (Columns 5 through 6) have little effect on the results. Even in specifications for which the initial reaction or the delayed reaction are not significantly different (Table IIA and IIB), there is a significant difference in the delayed response ratio for Friday and non-Friday announcements, as summarized in the first four samples in Figure 2.

These results provide a lower bound for the share of distracted agents. Using Corollary 1.(iii), the estimates for DRR^{NF} and DRR^{F} imply that the share of distracted agents μ_t is

[7] We thank Owen Lamont for suggesting this approach.

[8] In the specifications with controls, we estimate the effect at the average value of the controls.

larger than 0.4 for non-Friday announcements and larger than 0.6 for Friday announcements. Quantitatively, inattention appears to be substantial.

To estimate whether the findings depend more on the response to positive announcements (top quantile) or negative announcements (bottom quantile), we compute the delayed response ratio separately for the Top and Bottom Quantiles (last two samples in Figure 2). The numerator and denominator of DRR are estimated using the difference between average returns in quantile j and average returns in quantile 6. Friday announcements have higher delayed response ratios for both quantiles, compared to non-Friday announcements. For quantile 1, the Friday ratio (0.4133) is more than twice as large as the non-Friday ratio (0.1772). For quantile 11, the Friday ratio (0.6846) is 35 percent larger than the non-Friday ratio (0.5063).

Summary. For non-Friday announcements, 35 to 44 percent of the stock response is delayed. For Friday announcements, this figure is 55 to 64 percent. According to the model, these figures provide a lower bound for the share of distracted agents. The substantially higher delayed response ratio for Friday announcements is consistent with increased distraction postponing investor response on Friday. This pattern is observable both for positive and for negative surprises, although the results are less precise for negative surprises.

4.4 Non-linear regressions

In the OLS regressions above, we have restricted the attention to very positive and very negative earnings news. While this approach is simple and non-parametric, it does not take advantage of all available information. In order to use all the data, we impose identification restrictions on the relationship between earnings surprises and stock returns. We focus this Section on the immediate stock response $R_{t,k}^{(0,1)}$.[9]

Figure 1e plots the average return $R_{t,k}^{(0,1)}$ as a function of the average earnings surprise $s_{t,k}$ by quantile. The relationship between returns and surprises is monotonic but highly non-linear, with a clear S-shape (Kothari, 2001). The responsiveness of stocks to earnings surprises declines the larger the absolute value of the earning surprise. This non-linearity is consistent with the model if the measurement error of the earnings surprise is increasing in the magnitude of the surprise or if the cashflow news embedded in large earnings surprises is less persistent.

A second feature of Figure 1e is that the sensitivity to announcements on Friday is approximately proportional to the sensitivity on other days. Given these two features, we impose a proportionality restriction, while allowing for a non-linear shape of returns to earnings announcements. We estimate the non-linear regression:

$$R_{t,k}^{(0,1)} = (\alpha_6 + \textstyle\sum_{j\neq 6} \alpha_j d_{t,k}^j) * (1 + \phi^F d_{t,k}^F) * \prod_{c\in C} (1 + \Gamma_c X_{t,k}^c) + \varepsilon_{t,k}, \tag{7}$$

[9] Unfortunately, for the delayed response $R_{t,k}^{(2,75)}$ a proportionality restriction like the one that we apply for $R_{t,k}^{(0,1)}$ is not consistent with Figure 1b.

The coefficients α_j capture the average immediate stock return for non-Friday announcements in quantile j ($d^j_{t,k} = 1$) relative to quantile 6 (no surprise). The coefficients $\alpha_j + \alpha_6$, therefore, correspond to the average returns for quantile j in Figure 1a. The coefficient ϕ_F is the proportional increase (or decrease) in the return responsiveness for Friday versus non-Friday announcements. We impose a similar proportionality restriction for the standard set of controls, where C is the set of year, month, and size indicators.

Column 1 in Table III presents the results of specification (7) without control variables on the full sample of 121,381 observations. The R^2 of .0514 is substantially higher than the R^2 of .0085 for a piece-wise linear specification $R^{(0,1)}_{t,k} = \alpha + \alpha_1 s_{t,k} + \phi^F s_{t,k} d^F_{t,k} + \gamma d^F_{t,k} + \varepsilon_{t,k}$.[10] The coefficients α_j (not shown) are monotonic in the surprise quantile j, mirroring the patterns in Figure 1a. The relationship between earnings surprises and immediate stock returns is 18.74 percent flatter for Friday announcements ($\hat{\phi}^F = -.1874$). The effect is precisely estimated and consistent with the finding of an 18.6 percent lower immediate response for the extreme quantiles (Table IIA). With controls (Column 2), the immediate stock reaction is 16.33 percent flatter for Friday announcements ($\hat{\phi}^F = -.1633$), a significant difference. The results are similar when we also control for earnings surprise volatility (Column 3). When we allow for a different response on each weekday, the immediate stock response is significantly different (lower) only for Friday announcements (not shown).

We consider an alternative functional form employing the inverse tangent (arctan) function (Kothari, 2001) instead of a step function as in (7):

$$R^{(0,1)}_{t,k} = (\phi_0 + \phi_2 \arctan[\phi_1 s_{t,k}] * (1 + \phi_{pos} d_{pos})) * (1 + \phi^F d^F_{t,k}) * \prod_{c \in C} (1 + \Gamma_c X^c_{t,k}) + \varepsilon_{t,k}. \quad (8)$$

This function produces the S-shaped pattern evident in Figure 2b with only three parameters (ϕ_0, ϕ_1, and ϕ_2). In addition, the parameter ϕ_{pos} permits a different sensitivity to positive surprises (d_{pos}) relative to negative surprises. In this specification (Column 4), the R^2 is slightly higher than the R^2 for the baseline specification with controls (Column 2), even though the arctan function has 5, rather than 12 earnings surprise parameters. The immediate stock returns are 22.24 percent more responsive to positive surprises than to negative surprises ($\hat{\phi}_{pos} = .2224$) possibly reflecting accounting conservatism. Most importantly, this responsiveness is 15.52 percent flatter for Friday announcements ($\hat{\phi}^F = -.1552$), a significant effect similar to the baseline estimate of 16.33 percent.

In the Homogeneous Sample (Column 5), stock returns in the short-run respond 12.52 percent less to Friday earning surprises than to non-Friday earning surprises. Given the smaller sample, the result is less precisely estimated and only marginally significant, but the point estimate is similar to the baseline estimate from the whole sample. To remove the effect of potential earnings surprise outliers, we replicate the specification in Column 2 after excluding

[10] Bagnoli et al. (2005) use a piece-wise linear specification and find that the short-run response to Friday announcements is muted for negative surprises.

earnings announcements in the top and bottom quantile (Column 6). The immediate stock response to Friday announcements is still significantly flatter than the response on other days.

Summary. Friday announcements are associated with a 12 to 21 percent lower response of stock prices in the two days surrounding the announcement. These results are not sensitive to the introduction of controls or specification modifications, and are consistent with the results obtained using only the top and bottom quantile (Table IIA). The decreased initial response fits the hypothesis that Friday and the weekend temporarily distract investors.[11]

4.5 Portfolio returns

The post-earnings announcement drift is substantially larger for Friday announcements than for non-Friday announcements. As an alternative measure of this differential drift, we present the returns to a portfolio that buys the Friday drift and sells the drift on other weekdays.

We analyze a monthly strategy from January 1995 to June 2004. The non-Friday drift portfolio for calendar month t purchases companies that, in month $t-1$, made an announcement on a non-Friday in the top quantile; the portfolio sells short companies that, in month $t-1$, made an announcement on a non-Friday in the bottom quantile[12]. Therefore, the return for the non-Friday drift portfolio is $R^D_{NF} = R^{11}_{NF} - R^1_{NF}$, where the returns refer to calendar month t. The average non-Friday portfolio includes 170 stocks per month (115 long positions and 55 short positions). We compute monthly portfolio returns by equally weighting the relevant individual stock returns.[13] Figure 3 shows year-by-year the average monthly return of this portfolio, which is between 0 to 2 percent.

We construct a Friday drift portfolio for month t following a similar procedure except that we consider only companies that made an announcement on Friday during the previous month, $R^D_F = R^{11}_F - R^1_F$. The average Friday portfolio includes 15 stocks per month (8 long positions and 7 short positions). The average monthly return for this portfolio is higher, approximately 6 percent per month (Figure 3), but more volatile given the smaller number of companies making Friday announcements. Nevertheless, in 8 years out of 10 the Friday drift portfolio has higher returns than the non-Friday drift portfolio, and it performs substantially worse only in

[11]We would like to test whether the decrease in the initial response occurs mainly on Friday, before the weekend, or on Monday, after the weekend. However, this test requires that the fraction of announcements taking place after market close be similar for Friday and non-Friday announcements. Unfortunately, in recent years Friday announcements are significantly less likely to occur after hours (Bagnoli et al., 2005), making a direct comparison impossible.

[12]An announcement is part of the portfolio in month t if the second trading day after the announcement is in month $t-1$. We compute the breakpoints for the 11 quantiles with the procedure described in Section 4.1, except that we use the breakpoints from the prior calendar year. This guarantees that the portfolio selection does not use any forward-looking information. If there are no stocks for a constituent portfolio, then that month is excluded from the performance analysis.

[13]Value-weighting the returns within the constituent portfolios yields similar results.

one year.

In Table IV, we evaluate a monthly portfolio that purchases (long position) the Friday drift portfolio and sells (short position) the non-Friday drift portfolio, $R^D_{F-NF} = R^D_F - R^D_{NF} = R^{11}_F - R^1_F - (R^{11}_{NF} - R^1_{NF})$. We control for market performance by regressing the series on the CRSP value-weighted stock index, net of the one-month Treasury rate. The standard errors are corrected for heteroskedasticity and autocorrelation using the Newey-West estimator with 6 lags[14]. The portfolio earns a significant monthly abnormal return of 4.38 percent (s.e. 1.33, Column 1). The estimated abnormal return increases somewhat if we include the size, book-to-market, and momentum factors (Column 2). While the magnitude of this effect seems implausibly large, we cannot reject a 1.8 percent monthly abnormal return, which is consistent with the estimated differential drift of 3.8 percentage points over 3 months (Table IIB).

One explanation of these results is that Friday announcements in the bottom and top quantiles have more extreme surprises, and that more extreme announcements display more drift. To address this explanation, we match announcements on the earnings surprise. For each Friday announcement in the bottom (top) quantile, we find the five non-Friday announcements in the same quantile and month with the closest earnings surprise, subject to the constraint that the non-Friday surprises must be larger in absolute value.[15] The latter requirement guarantees that the differential drift results are not driven by the presence of more extreme news in the Friday portfolio. The portfolio formed according to this procedure (Column 3) earns a monthly return of 6.35 percent that is somewhat larger than the return of the baseline portfolio (Column 2).

The abnormal returns are smaller (but still significant) if we compute the portfolios using the top 2 quantiles and the bottom 2 quantiles (Column 4). As in Table IIB, the differential Friday drift is smaller for these less extreme announcements. The portfolio return is lower (2.14 percent), albeit still significant, if we include companies that made announcements in months $t-1$ or $t-2$, rather than just in month $t-1$ (Column 5). Finally, in Column 6 we determine the top and bottom groups by sorting the announcements into deciles instead of quantiles. The average return of the strategy, 3.62 percent, is significant; while the return is lower than for the quantile-based procedure (Column 2), the significance level is in fact higher. The lower average return is not surprising because the decile approach selects less extreme announcements in the bottom group.

Summary. We detect significantly higher portfolio returns from a drift strategy on Friday announcements than on non-Friday announcements. The differential return is generated largely

[14]The results do not change qualitatively if the lag length for the Newey-West standard errors is 12.

[15]If there are fewer than five non-Friday announcements with more extreme earnings surprises than a specific Friday announcement, the returns of the stocks with these non-Friday announcements are overweighted appropriately. Friday announcements that can not be matched to at least one non-Friday announcement with a more extreme earnings surprise are excluded from the analysis.

in the first month after the announcement. The direction of the results is consistent with the findings in Table IIB, with larger point estimates.

5 Volume response

The immediate stock response to Friday earnings announcements is substantially lower than for non-Friday announcements. If this difference is caused by investor distraction, we expect a similar attenuation of trading volume in response to Friday news, because trading is the mechanism that causes prices to adjust.[16] If the difference is instead driven by a higher dispersion of opinions for Friday announcements, we expect greater abnormal volume, rather than less, after Friday announcements.

The measure for abnormal volume is

$$\Delta v_{t,k}^{(h,H)} = \sum\nolimits_{u=h}^{H} \log\left(V_{t,k}^{u}\right) / (H-h+1) - \sum\nolimits_{u=-20}^{-11} \log\left(V_{t,k}^{u}\right) /10, \quad (9)$$

where $V_{t,k}^{\tau}$ is the value of the shares traded on the τ-th trading day after the earning announcement in quarter t of company k. The measure $\Delta v_{t,k}^{(h,H)}$ is the percentage increase in volume around announcement date at horizon (h,H), relative to baseline volume for stock k in quarter τ. In particular, $\Delta v_{t,k}^{(0,1)}$ is the immediate abnormal volume due to the announcement.

Graphical evidence. Figure 4 plots the average abnormal volume $\Delta v_{t,k}^{(h,H)}$ at various horizons. For non-Friday announcements, the abnormal volume increases to 45 percent on the day of the announcement, to 58 percent on the next trading day, and then it decays slowly. A week after the announcement, the trading volume is still 12 percent higher than normal. The abnormal volume for Friday announcements is 10 percent higher compared to non-Friday announcements on the announcement day, and 40 percent lower on the next trading day. During the subsequent days, abnormal volume is similar for Friday and non-Friday announcements.

The main difference between Friday and non-Friday announcements occurs during the day of and the day after the announcement. Abnormal volume $\Delta v_{t,k}^{(0,1)}$ is substantially lower for Friday than for non-Friday announcements. (The measures $\Delta v_{t,k}^{(0,0)}$ and $\Delta v_{t,k}^{(1,1)}$ need to be considered together because the share of after-hour announcements is lower on Friday, as discussed in Section 4.4) Our interpretation of this finding is that the weekend distracts investors. This interpretation also suggests why the difference between Friday and non-Friday announcements mostly disappears by day $\tau+2$. Two offsetting forces are at work. On the one hand, some of the investors that have been distracted by the weekend are still not trading. On the other hand, other investors trade to respond to the underreaction after the weekend.

Regressions. We test whether the finding of lower abnormal volume $\Delta v_{t,k}^{(0,1)}$ for Friday

[16] This prediction does not follow from the model because it has no natural definition of trading volume.

announcements is affected by adding control variables. We run the OLS specification

$$\Delta v_{t,k}^{(0,1)} = \alpha + \sum_{j \neq 6} \alpha_j d_{t,k}^j + \phi^F d_{t,k}^F + \Gamma X_{t,k} + \varepsilon_{t,k}. \quad (10)$$

The terms $d_{t,k}^j$ are indicators for earning surprises $s_{t,k}$ in the j-th quantile, with quantile 6 ($s_{k,t} = 0$) as the omitted category. The control variables $X_{t,k}$, as usual, are month, year, and size indicators, as well as earnings surprise volatility indicators in one specification. Without controls (Column 1 of Table V), the Friday coefficient is negative and significant, $\hat{\phi}^F = -.1052$. Compared to the average immediate volume increase on non-Fridays, .5161, the abnormal volume increase on Friday is .1052/.5161 = 20.3 percent lower. With controls (Column 2), the Friday effect is larger ($\hat{\phi}^F = -.1243$).

In Column 3 we introduce firm fixed effects to control for any company-level difference in abnormal volume. Some of the Friday effect appears to be due to heterogeneity in abnormal volume among firms, but the remaining effect ($\hat{\phi}^F = -0.0480$) is still large and significant. The 9.3 percent attenuation of abnormal volume for Friday announcements (.0480/.5161 = .0093) is similar to the 12 to 20 percent flattening of short-run stock returns (Tables IIA and III). We include firm fixed effects in the subsequent specifications. The results are similar after controlling for earnings surprise volatility (Column 4) and in the Homogeneous Sample (Column 5).

Since the attenuation of abnormal volume for Friday announcements could be explained by lower aggregate market volume on Monday, we introduce a control for aggregate volume[17]. (Of course, the inattention hypothesis predicts that aggregate volume should be lower on Friday and Monday.) After controlling for abnormal aggregate volume, the Friday effect is lower but still significant (Column 6).

Summary. Short-term abnormal volume is significantly lower for Friday earnings announcements, even after controlling for announcement quality, control variables, and firm-specific variation. The Friday effect in abnormal volume is of the same order of magnitude as the Friday effect in immediate returns. The volume results are consistent with the hypothesis that investors underreact initially to information released on Friday.

6 Alternative explanations

In this Section we consider four alternative explanations of the findings, information processing time, pre-announcement release, announcement delay, and firm heterogeneity. We also discuss an attention-related interpretation that is inconsistent with the data.

Information processing time. The mechanics of Friday and non-Friday announcements differ. First, Friday announcements in the 1970s were more likely to be made when the market

[17] We measure aggregate volume as the equal-weighted average across firms of the number of shares traded, divided by shares outstanding. We generate the abnormal aggregate volume $\Delta v_{t,A}^{(0,1)}$ using formula (9).

was closed (Patell and Wolfson, 1982). Second, Friday announcements are followed by a two-day break in trading. For both reasons, investors have a different amount of time to process Friday announcements. However, these factors bias the analysis against finding underreaction. During our sample period, Friday announcements are *less* likely to be released after the market is closed (Bagnoli et al., 2005). (This explains why more of the volume response for Friday announcements occurs on the same day instead of the next day—Figure 4). Moreover, the two-day break in trading allows investors more time (not less) to assimilate new information.

Pre-announcement release. Companies release in advance the date of the earnings announcements. In the event of poor performance, companies may also issue earnings warnings. These pre-announcement releases could explain the lower immediate reaction of stock prices to Friday announcements. Assume that firms announcing on Friday are more likely to issue earnings warnings. Additionally, the decision to announce on Friday, itself, could be interpreted as a warning about earnings. Stock prices may respond before the official earnings announcement. Because forecasts are not always revised after these pre-announcements, the negative surprises constructed from the media forecast may overestimate the 'true' surprise to investors. This hypothesis can explain a lower short-term reaction of stock returns to negative surprises. However, it does not explain the attenuated short-term reaction for positive surprises. If anything, it predicts a stronger short-term response to positive announcements. This interpretation is also unable to explain differential drift. Further, we can directly test whether investors perceive more negative news before Friday announcements, conditional on the quantile of the surprise. Figure 1d displays stock returns for the horizon (-30,-1) as a function of the quantiles of earnings surprises. In each of the outermost quantiles, the average pre-announcement returns are very similar for Friday and non-Friday announcements.

Announcement Delay. Stock prices decline before an earnings announcement if the announcement is delayed (Begley and Fischer, 1998; Bagnoli, Kross, and Watts, 2002). It is possible that Friday announcements are more likely to be late. Hence, part of the stock price reaction may occur before the earnings announcement. However, Bagnoli et al. (2002) also find that the response to earnings information is similar for on-time and late announcements. Late announcements, therefore, do not explain the flatter short-term response to Friday earnings announcements. In addition, delaying an announcement is essentially a pre-announcement warning. As we discussed above, there is no evidence of lower pre-announcement returns for negative earnings surprises announced on Friday (relative to other weekdays), after controlling for the earnings surprise quantiles (Figure 1d).

Firm heterogeneity. The attenuated immediate response on Friday could be due to unobserved heterogeneity. For example, the news about future profitability embedded in earnings announcements may be more transitory for firms making Friday announcements, or may reflect more divergence in opinions. Some of these explanations are not consistent with other findings. For example, if the Friday news were more temporary, we would expect less drift;

if they reflected a higher divergence in opinions, we would expect a higher initial abnormal volume. While it is impossible to fully control for all forms of heterogeneity, we show that the results remain qualitatively unchanged after the introduction of time, company, and market capitalization controls.

Task overload. An attention-related interpretation is that investors on Monday are overburdened by the information that has accumulated on their desks during the weekend and they find less time to react to Friday earnings announcements. However, aggregate volume is 10 percent lower on Monday, contrary to the hypothesis that traders are overburdened by information on Monday.

7 Conclusion

We have compared the reaction to earnings announcements on Friday to the reaction on other weekdays. Friday announcements are characterized by a lower immediate, and a higher delayed, response. The delayed response as a percentage of the total response is 60 percent on Friday and 40 percent on other weekdays. A portfolio that invests in the differential Friday drift earns substantial returns. We observe analogous results for volume.

The evidence supports the inattention hypothesis. On Friday, investors are distracted from work-related activities. Given limited attention, distractions cause underreaction to the earnings information. Eventually, investors realize the mispricing and incorporate the information. The evidence that a distracting event increases the delayed reaction supports the theory that underreaction to new information is an important source of the post-earnings drift.

A Appendix

Equilibrium. In equilibrium, total demand must equal total supply for the risky asset or $\int_0^1 \lambda_t^i di = 1$. After substituting for λ_t^i in this expression, we solve for P_t:

$$P_t = \frac{b_t E_t^{\mu}[D_{t+1} + P_{t+1}] + (1 - b_t) E_t^{1-\mu}[D_{t+1} + P_{t+1}] - a_t}{1 + R} = \frac{\overline{E}_t[D_{t+1}] + \overline{E}_t[P_{t+1}] - a_t}{1 + R}$$

where $a_t = \left(\frac{\mu_t}{\gamma \sigma^2_{\mu,t,P+D}} + \frac{1-\mu_t}{\gamma \sigma^2_{1-\mu,t,P+D}} \right)^{-1}$, $\overline{E}_t = b_t E_t^{\mu}[.] + (1 - b_t) E_t^{1-\mu}[.]$ and $b_t = \frac{\mu_t}{\gamma \sigma^2_{\mu,t,P+D}} a_t$. Recursively solving forward expression and also imposing the relevant transversality condition $\lim_{T\to\infty} \left(\overline{E}_t \overline{E}_{t+1} \ldots \overline{E}_{t+T+1}[P_{t+T+2}] \right) / (1 + R)^{T+2} = 0$ yields

$$P_t = \frac{\overline{E}_t[D_{t+1}] - a_t}{1 + R} + \sum_{s=1}^{\infty} \frac{\overline{E}_t \overline{E}_{t+1} \ldots \overline{E}_{t+s}[D_{t+s+1} - a_{t+s}]}{(1 + R)^{s+1}}.$$

Since the information available at time t is uninformative regarding D_{t+s+1}, $\forall\ s > 0$, we know that $\overline{E}_{t+1} \overline{E}_{t+2} \ldots \overline{E}_{t+s}[D_{t+s+1}] = \delta$. Since future signals about dividends are unforecastable, the strategic release of future signals is unforecastable as well. As long as perceived variances are time-invariant (verified below), $E^{\mu}_{t+s-1}[a_{t+s}] = E^{1-\mu}_{t+s-1}[a_{t+s}] = \bar{a}$ where $\bar{a} = \eta a(\mu_h) + (1 - \eta)\, a(\mu_l)$ and $\eta = prob(\mu_{t+s} = \mu_h)$. Consequently, $\overline{E}_t \overline{E}_{t+1} \ldots \overline{E}_{t+s}[a_{t+s}] = \bar{a}$ and the formula for the equilibrium price follows.

Time-invariant perceived variances. We show that $\sigma^2_{\mu,t,P+D}$ and $\sigma^2_{1-\mu,t,P+D}$ do not depend on t. First, we solve for $\sigma^2_{\mu,t,P+D}$:

$$\begin{aligned} \sigma^2_{\mu,t,P+D} &= E_t^{\mu}[(P_{t+1} + D_{t+1} - E_t^{\mu}[P_{t+1} + D_{t+1}])^2] \\ &= E_t^{\mu}\left[\left(\frac{(1 - b_{t+1}) s_{t+1} - a_{t+1} - (E_t^{\mu}\left[(1 - b_{t+1}) s_{t+1}\right] - \bar{a})}{1 + R} + s_t + \varepsilon_{t+1} \right)^2 \right] \\ &= \left(\frac{1}{1 + R} \right)^2 \sigma^2_{(1-b)s-a} + \sigma_s^2 + \sigma_\varepsilon^2 \end{aligned}$$

Similarly, $\sigma^2_{1-\mu,t,P+D} = \left(\frac{1}{1+R}\right)^2 \sigma^2_{(1-b)s-a} + \sigma_\varepsilon^2$. If the strategic behavior of managers is time-invariant (proposition 2), neither perceived variance expression depends on t.

Comparative statics for a_t and b_t. Let $k = (1 + R)^{-2} \sigma^2_{(1-b)s-a} + \sigma_\varepsilon^2$. We substitute the expressions for $\sigma^2_{\mu,P+D}$, $\sigma^2_{1-\mu,P+D}$, and k into the definition of a_t and rearrange to obtain.

$$a_t = \gamma \left(k^2 + k\sigma_s^2 \right) \left(k + \sigma_s^2 (1 - \mu_t) \right)^{-1}$$

Since $k > 0$, it follows that $a_h > a_l$. Using a similar procedure,

$$b_t = k\mu_t \left(k + \sigma_s^2 (1 - \mu_t) \right)^{-1}$$

which implies that $b_h > b_l$ and $b_t(\mu_t = 0) = 0$.

Proof of Proposition 1. For part (i) we start with the definition of IR_t,

$$\begin{aligned} E_t[IR_t] &= E_t[Z_t - E_{t-1}[Z_t] - (D_t - E_{t-1}[D_t])] = P_t - E_{t-1}[P_t] = \\ &= -\frac{a_t - \bar{a}}{1+R} + \frac{(1-b_t)s_t - E_{t-1}[(1-b_t)s_t]}{1+R} = \frac{\bar{a} - a_t}{1+R} + \frac{\sigma_{bs}}{1+R} + \frac{1-b_t}{1+R}s_t. \end{aligned}$$

The remainder of the proof follows from $b_h > b_l$ and $b_t(\mu_t = 0) = 0$. For part (ii) we start with the definition of $E_t[Z_{t+1}]$.

$$\begin{aligned} E_t[Z_{t+1}] &= E_t[P_{t+1} + D_{t+1} - (1+R)P_t] \\ &= -\frac{E_t[b_{t+1}s_{t+1}]}{1+R} + s_t + a_t - (1-b_t)s_t = a_t - \frac{\sigma_{bs}}{1+R} + b_t s_t. \end{aligned}$$

This implies $E_t[DR_t] = E_t[Z_{t+1}] - E_{t-1}[Z_{t+1}] = a_t - \bar{a} + b_t s_t - E_{t-1}[b_t s_t] = a_t - \bar{a} - \sigma_{bs} + b_t s_t$. The remainder of the proof follows from $b_h > b_l$ and $b_t(\mu_t = 0) = 0$. For part (iii) we rewrite that $Z_{t+1,t-1}$ as $Z_{t+1} + (1+R)Z_t$. We substitute this expression for $Z_{t+1,t-1}$ into the expression for $E_t[LR_{t+1}]$ (in the text) to obtain

$$\begin{aligned} E_t[LR_{t+1}] &= [(E_t[Z_t] - E_{t-1}[Z_{t-1}]) - (E_t[D_t] - E_{t-1}[D_t])] + \frac{E_t[Z_{t+1}] - E_{t-1}[Z_{t+1}]}{1+R} \\ &= E_t[IR_t] + \frac{E_t[DR_t]}{1+R} \end{aligned}$$

The remainder of the proof follows from this expression for $E_t[LR_{t+1}]$ and parts (i) and (ii).

Proof of Corollary 1. Part (i) follows from the expressions for $E_t[DR_t]$ and $E_t[LR_{t+1}]$ in the proof of proposition 1. Part (ii) follows from $b_h > b_l$ and $b_t(\mu_t = 0) = 0$. Part (iii) follows from $R > 0$ and the definition of b_t because $\sigma^2_{1-\mu,t,P+D}$ is necessarily smaller than $\sigma^2_{\mu,t,P+D}$.

Proof of Proposition 2. Parts (i) and (iii) are discussed in the body of the paper. We prove part (ii). The problem of the short-term manager is equivalent to solving $\max_{\mu_t \in \{\mu_h, \mu_l\}} -a_t - b_t s_t$. Substituting in the values of a_t and b_t, we obtain

$$\max_{\mu_t \in \{\mu_h, \mu_l\}} \left(-\gamma - \frac{\mu_t s_t}{k + \sigma_s^2}\right)\left(\frac{\mu_t}{k+\sigma_s^2} + \frac{1-\mu_t}{k}\right)^{-1}$$

where $k = (1+R)^{-2}\sigma^2_{bs-a} + \sigma^2_\varepsilon > 0$. Announcing on a high-distraction day is optimal if and only if

$$\left(-\gamma - \frac{\mu_h s_t}{k + \sigma_s^2}\right)\left(\frac{\mu_h}{k+\sigma_s^2} + \frac{1-\mu_h}{k}\right)^{-1} \geq \left(-\gamma - \frac{\mu_l s_t}{k + \sigma_s^2}\right)\left(\frac{\mu_l}{k+\sigma_s^2} + \frac{1-\mu_l}{k}\right)^{-1}$$

Multiplying the terms together and simplifying leads to $\mu_h s_t - \gamma\sigma_s^2\mu_l \leq \mu_l s_t - \gamma\sigma_s^2\mu_h$, and finally to $s_t \leq -\sigma_s^2\gamma$, the desired condition. Given this threshold rule, $E[s_t|\mu_t = \mu_h] < 0$ and $E[s_t|\mu_t = \mu_l] > 0$ follow immediately. Hence, $E[s_t|\mu_t = \mu_h] < E[s_t|\mu_t = \mu_l]$. The relationship $E[IR_t|\mu_t = \mu_h] < E[IR_t|\mu_t = \mu_l]$ follows from

$$E[IR_t|\mu_t = \mu_h] - E[IR_t|\mu_t = \mu_l] = \frac{a_l - a_h}{1+R} + \frac{1-b_h}{1+R}E[s_t|\mu_t = \mu_h] - \frac{1-b_l}{1+R}E[s_t|\mu_t = \mu_l]$$

because $a_l - a_h < 0$, $E[s_t|\mu_t = \mu_h] < 0$, and $E[s_t|\mu_t = \mu_l] > 0$.

References

[1] Bagnoli, Mark, Michael B. Clement, and Susan G. Watts. "Around-the-Clock Media Coverage and The Timing of Earnings Announcements", mimeo, 2005.

[2] Bagnoli, Mark, William Kross, and Susan G. Watts. "The Information in Management's Expected Earnings Report Date: A Day Late, a Penny Short", *Journal of Accounting Research*, Vol. 40, 1275-1296, 2002.

[3] Baker, Malcolm, Richard Ruback, and Jeffrey Wurgler. "Behavioral Corporate Finance: A Survey." In *The Handbook of Corporate Finance: Empirical Corporate Finance*, edited by Espen Eckbo. New York: Elsevier/North Holland, forthcoming.

[4] Barber, Brad M. and Terrance Odean. "All that Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors", *Review of Financial Studies*, forthcoming.

[5] Barberis, Nicholas, Andrei Shleifer, and Robert Vishny. "A model of investor sentiment", *Journal of Financial Economics,* Vol. 49, 307-343, 1998.

[6] Begley, Joy and Paul Fischer. "Is there Information in an Earnings Announcement Delay?", *Review of Accounting Studies,* Vol. 3, 347-364, 1998.

[7] Bernard, Victor L. and Jacob K. Thomas. "Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium?", *Journal of Accounting Research,* Vol. 27, 1-36, 1989.

[8] Bernard, Victor L. and Jacob K. Thomas. "Evidence That Stock Price Do Not Fully Reflect the Implications of Current Earnings For Future Earnings", *Journal of Accounting and Economics,* Vol. 13, 305-340, 1990.

[9] Chan, Louis, Narasimham Jegadeesh, and Josef Lakonishok. "Momentum Strategies", *Journal of Finance,* Vol. 51, 1681-1713, 1996.

[10] Cremers, K.J. Martijn and Vinay B. Nair. "Governance Mechanisms and Equity Prices," *Journal of Finance,* forthcoming.

[11] Damodaran, Aswath. "The Weekend Effect in Information: A Study of Earnings and Dividend Announcements", *Review of Financial Studies,* Vol. 4, 607-623, 1989.

[12] Daniel, Kent, David Hirshleifer, and Avanidhar Subrahmanyam. "Investor Psychology and Security Market Under-and Overreactions", *Journal of Finance,* Vol. 53, 1839-1885, 1998.

[13] DellaVigna, Stefano and Ulrike Malmendier. "Contract Design and Self-Control: Theory and Evidence", *Quarterly Journal of Economics,* Vol. 119, 353–402, 2004.

[14] DellaVigna, Stefano and Joshua M. Pollet. "Attention, Demographics, and the Stock Market", NBER WP. w11211, 2005a.

[15] DeLong, J. Bradford, Andrei Shleifer, Lawrence H. Summers, Robert J. Waldmann. "Noise Trader Risk in Financial Markets", *Journal of Political Economy,* Vol. 98, 703-738, 1990.

[16] Dyck, Alexander and Luigi Zingales. "The Media and Asset Prices", mimeo, 2003.

[17] Frazzini, Andrea. "The Disposition Effect and Under-Reaction to News", *Journal of Finance,* Vol. 61, 2017-2046, 2006.

[18] Gabaix, Xavier and David Laibson. "Shrouded Attributes and Information Suppression in Competitive Markets", *Quarterly Journal of Economics*, Vol. 121, 505-540, 2006.

[19] Gabaix, Xavier, David Laibson, Guillermo Moloche and Stephen Weinberg. "The Allocation of Attention: Theory and Evidence", *American Economic Review*, Vol. 96, 1043-1068, 2006.

[20] Gompers, Paul, Joy Ishii, and Andrew Metrick. "Corporate Governance and Equity Prices", *Quarterly Journal of Economics*, Vol. 118, 107-155, 2003.

[21] Grinblatt, Mark and Bing Han. "Prospect Theory, Mental Accounting, and Momentum", *Journal of Financial Economics*, forthcoming.

[22] Hirshleifer, David, Sonya Lim and Siew Hong Teoh. "Driven to Distraction: Extraneous Events and Underreaction to Earnings News", mimeo, 2006.

[23] Hirshleifer, David and Siew Hong Teoh. "Limited Attention, Information Disclosure, and Financial Reporting", *Journal of Accounting and Economics,* Vol. 36, 337-386, 2003.

[24] Hong, Harrison and Jeremy Stein. "A Unified Theory of Underreaction, Momentum Trading, and Overreaction in Asset Markets", *Journal of Finance,* Vol. 54, 2143-2184, 1999.

[25] Huberman, Gur, and Tomer Regev. "Contagious Speculation and a Cure for Cancer: A Nonevent that Made Stock Prices Soar", *Journal of Finance*, Vol. 56, 387-396, 2001.

[26] Jegadeesh, Narasimhan, and Sheridan Titman. "Returns to Buying Winners and Selling Losers: Implications For Stock Market Efficiency", *Journal of Finance,* Vol. 48, 65-91, 1993.

[27] Keim, Donald and Robert Stambaugh. "A Further Investigation of the Weekend Effect in Stock Returns", *Journal of Finance,* Vol. 39, 819-835, 1984.

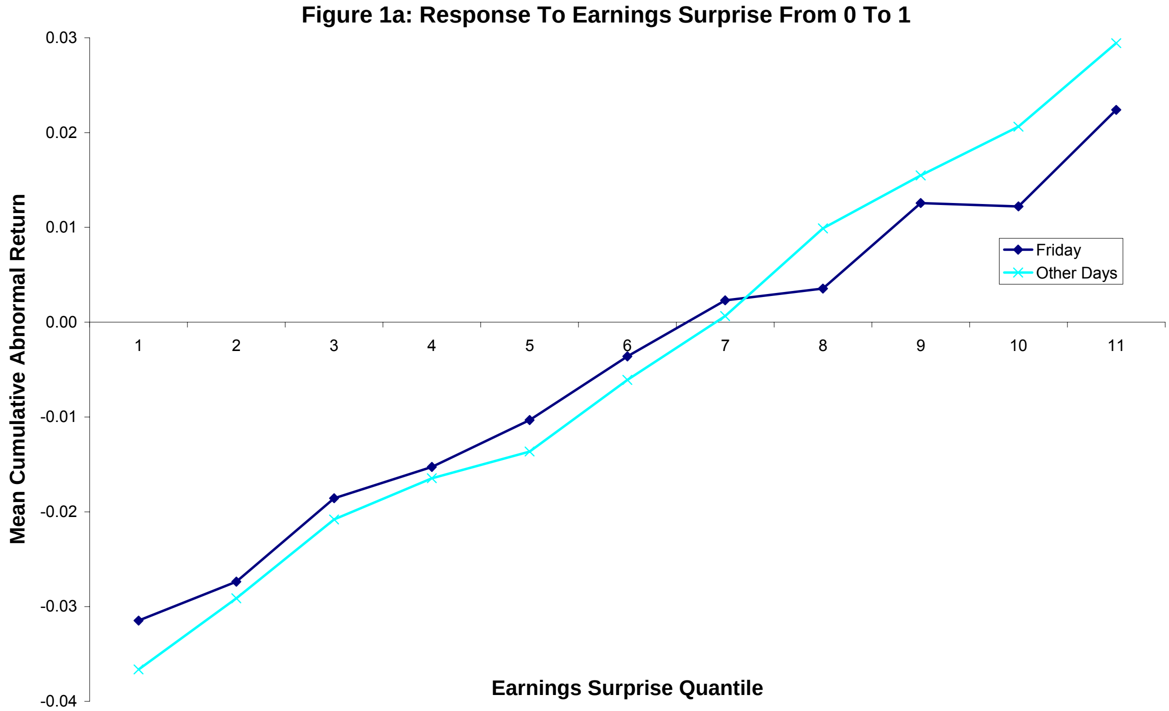
[28] Kothari, S.P. "Capital Markets Research in Accounting", *Journal of Accounting and Economics,* Vol. 31, 105-231, 2001.

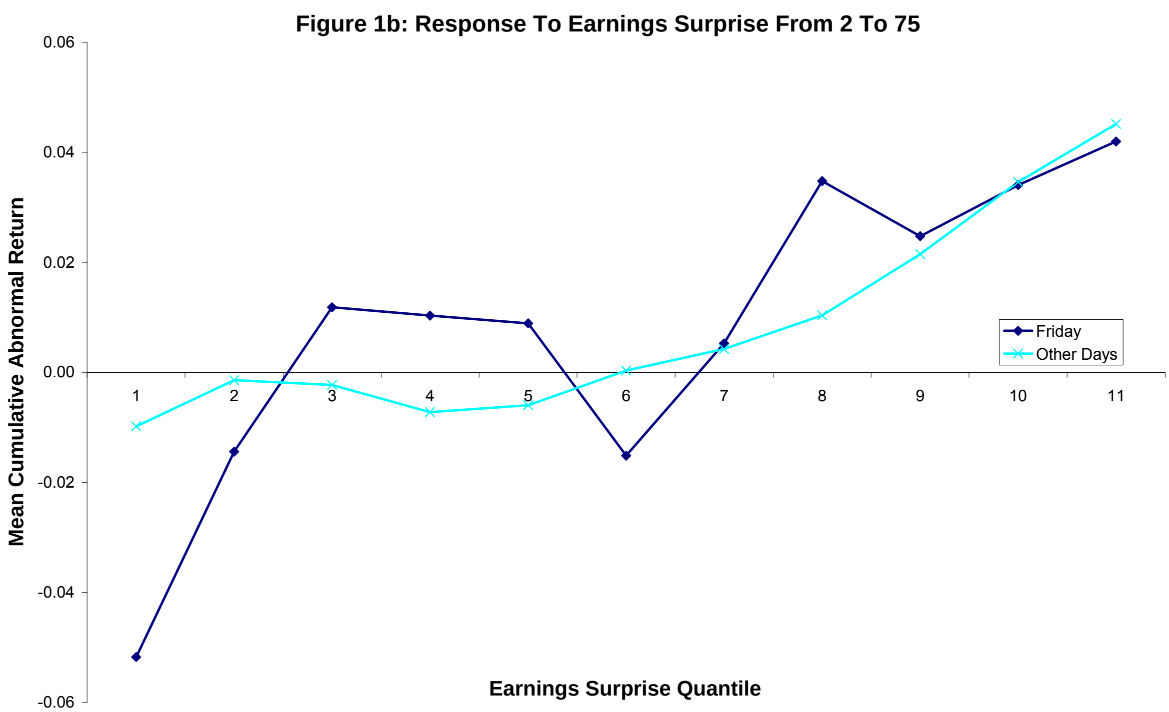
[29] Patell, James M. and Mark A. Wolfson. "Good News, Bad News and the Intraday Timing of Corporate Disclosures", *The Accounting Review,* Vol. 57, 509–527, 1982.

[30] Peng, Lin and Wei Xiong. "Investor Attention, Overconfidence and Category Learning", *Journal of Financial Economics,* Vol. 80, pp. 563-602, 2006.

[31] Penman, Stephen H. "The Distribution of Earnings News Over Time and Seasonalities in Aggregate Stock Returns", *Journal of Financial Economics,* Vol. 18, 199-228, 1987.

[32] Shleifer, Andrei. *Inefficient Markets: An Introduction to Behavioral Finance. Clarendon Lectures in Economics.* Oxford and New York: Oxford University Press, 2000.





Figures 1a-1b. Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. In event time, day 0 is the day of the announcement. The cumulative abnormal return for each stock is the raw buy-and-hold return adjusted using the estimated beta from market model. The earnings surprise for an announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement. Quantiles 1 through 5 contain earnings announcements for five quintiles of negative earnings surprises and quantiles 7 through 11 contain earnings surprises for five quintiles of positive earnings surprises. Quantile number 6 contains all announcements with an earnings surprise equal to zero. Since the number of negative earnings surprises, the number of surprises equal to zero, and the number of positive earnings surprises are not equal, the number of observations in each quantile differ. The breakpoints for the quantiles are determined separately for each year and announcements made on Saturday or Sunday are excluded from the sample.

Figure 1c: Response To Earnings Surprise From 0 To 75

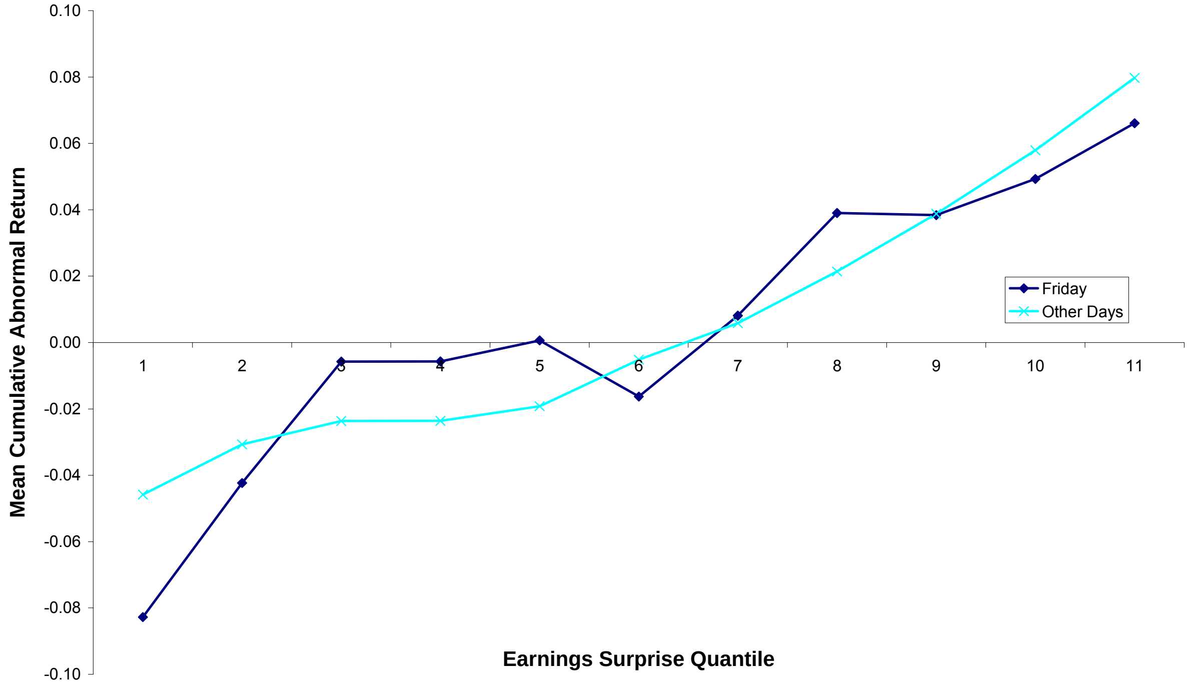
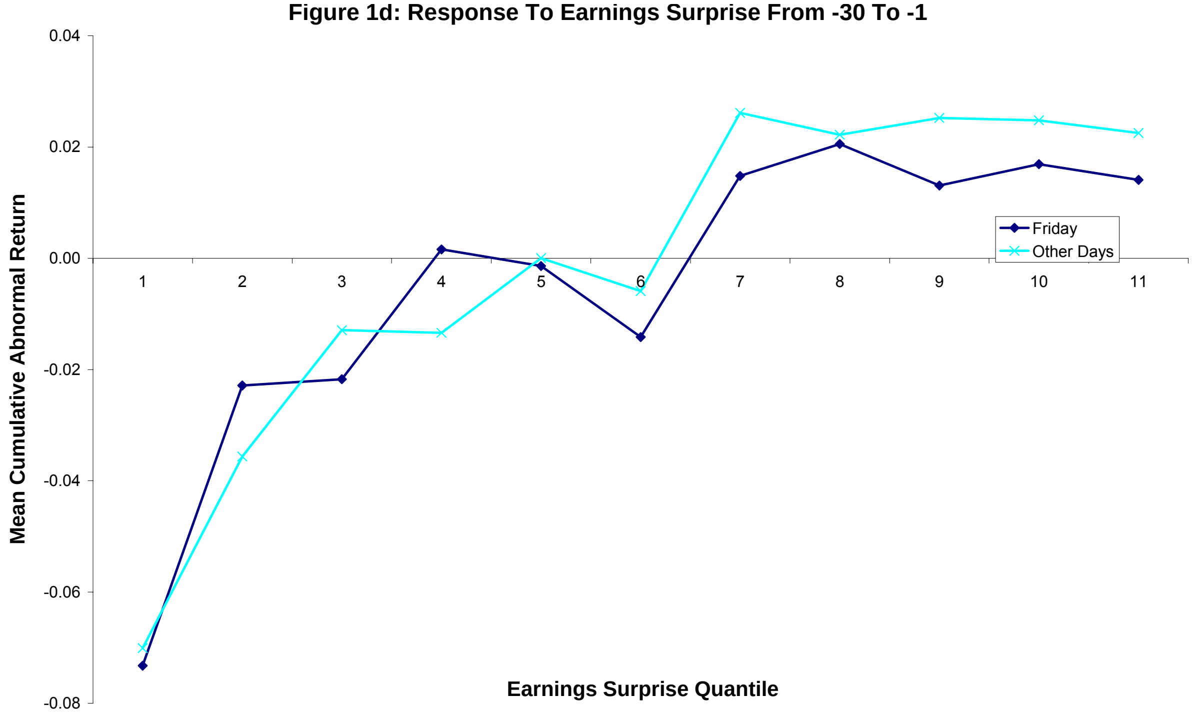
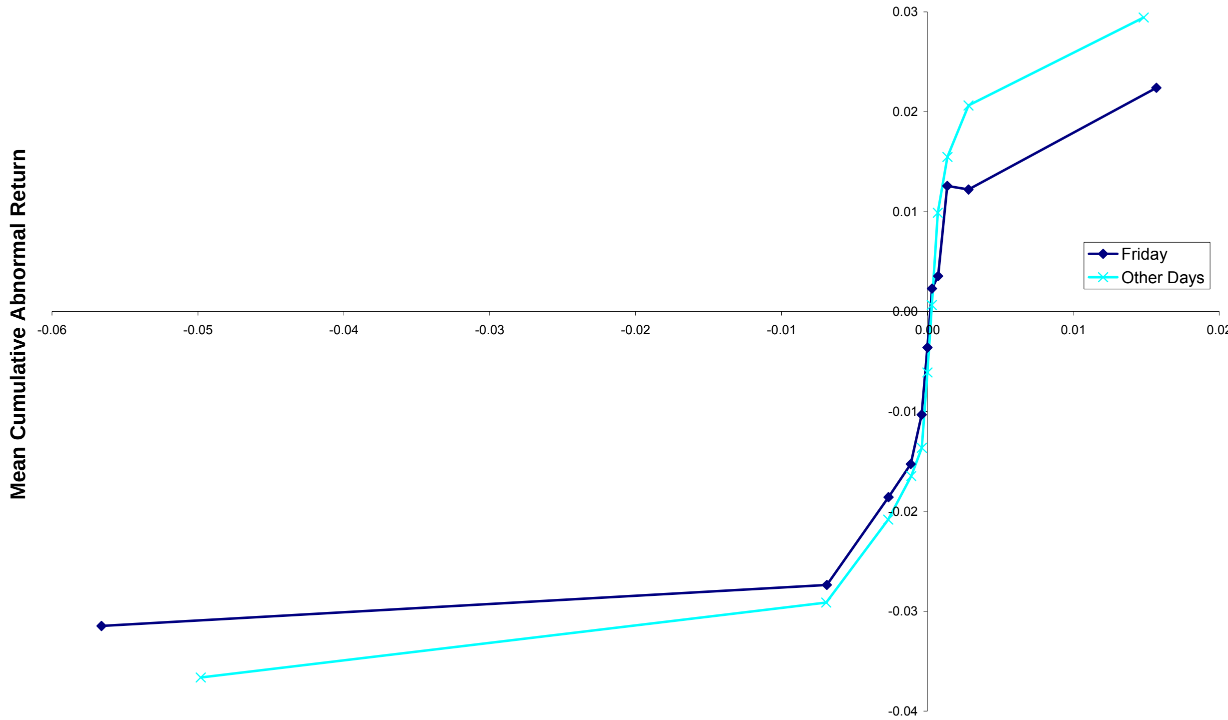


Figure 1d: Response To Earnings Surprise From -30 To -1



Figures 1c-1d. Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. In event time, day 0 is the day of the announcement. The cumulative abnormal return for each stock is the raw buy-and-hold return adjusted using the estimated beta from market model. The earnings surprise for an announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement. Quantiles 1 through 5 contain earnings announcements for five quintiles of negative earnings surprises and quantiles 7 through 11 contain earnings surprises for five quintiles of positive earnings surprises. Quantile number 6 contains all announcements with an earnings surprise equal to zero. Since the number of negative earnings surprises, the number of surprises equal to zero, and the number of positive earnings surprises are not equal, the number of observations in each quantile differ. The breakpoints for the quantiles are determined separately for each year and announcements made on Saturday or Sunday are excluded from the sample.

Figure 1e: Nonlinear Form of the Response to Earnings Surprise From 0 to 1



Average Surprise by Earning Surprise Quantile

	Quantile	1 Low	2	3	4	5	6 Surprise=	7	8	9	10	11 High
Friday	Average	-0.0566	-0.0069	-0.0027	-0.0011	-0.0004	0.0000	0.0003	0.0007	0.0014	0.0028	0.0157
	N	718	654	518	509	395	894	521	602	579	743	854
Other Days	Average	-0.0498	-0.0069	-0.0027	-0.0011	-0.0004	0.0000	0.0003	0.0007	0.0014	0.0028	0.0148
	N	6308	6290	6297	6299	6289	17830	13022	13020	13014	13015	13010

Figures 1e. Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. In event time, day 0 is the day of the announcement. The cumulative abnormal return for each stock is the raw buy-and-hold return adjusted using the estimated beta from market model. The earnings surprise for an announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement. Quantiles 1 through 5 contain earnings announcements for five quintiles of negative earnings surprises and quantiles 7 through 11 contain earnings surprises for five quintiles of positive earnings surprises. Quantile number 6 contains all announcements with an earnings surprise equal to zero. Since the number of negative earnings surprises, the number of surprises equal to zero, and the number of positive earnings surprises are not equal, the number of observations in each quantile differ. The breakpoints for the quantiles are determined separately for each year and announcements made on Saturday or Sunday are excluded from the sample.

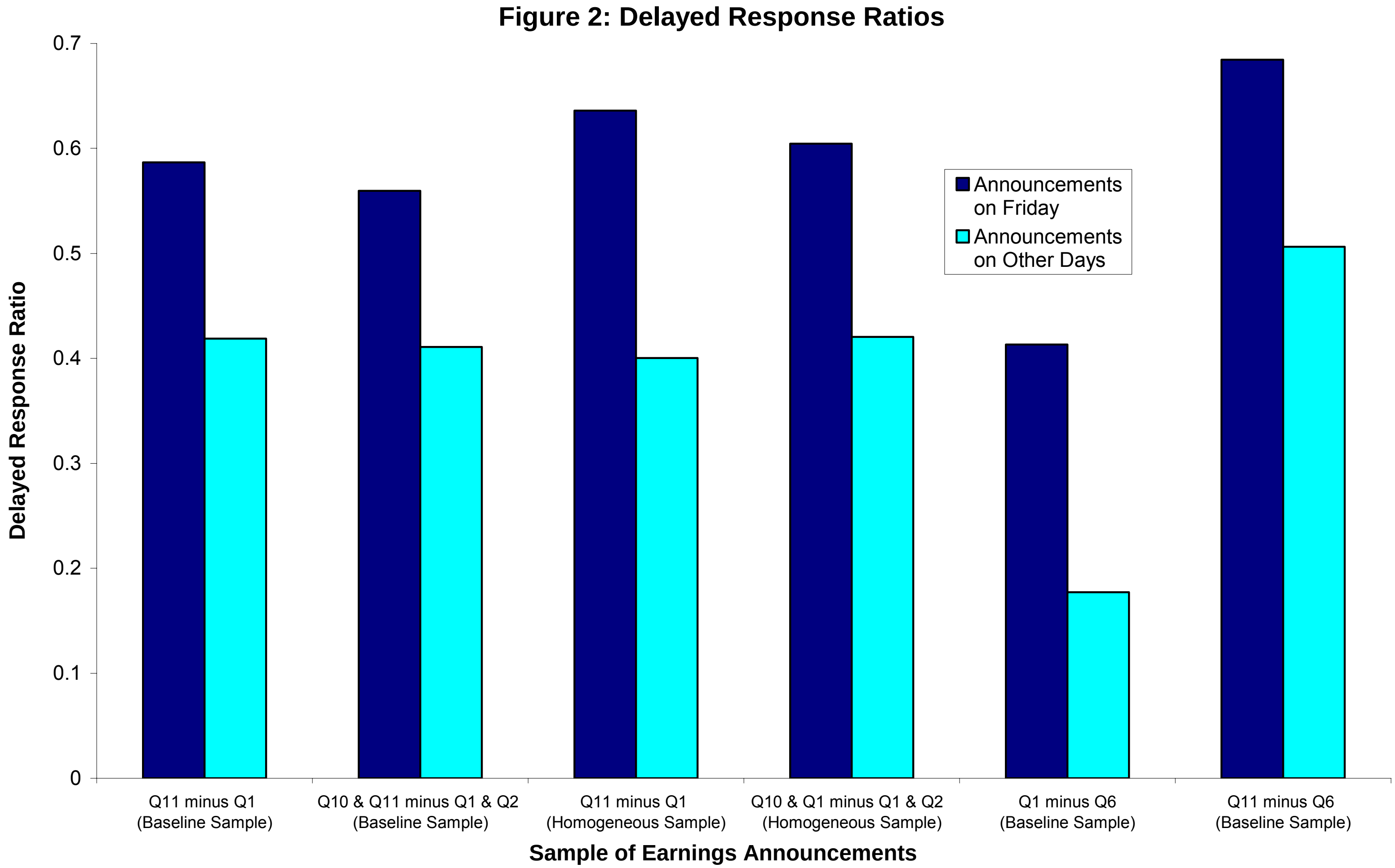


Figure 2. Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. In event time, day 0 is the day of the announcement. The cumulative abnormal return (CAR) for each stock is the raw buy-and-hold return adjusted using the estimated beta from market model. The earnings surprise for an announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement. Quantiles 1 through 5 contain earnings announcements for five quintiles of negative earnings surprises and quantiles 7 through 11 contain earnings surprises for five quintiles of positive earnings surprises. Quantile number 6 contains all announcements with an earnings surprise equal to zero. Since the number of negative earnings surprises, the number of surprises equal to zero, and the number of positive earnings surprises are not equal, the number of observations in each quantile differ. The breakpoints for the quantiles are determined separately for each year and announcements made on Saturday or Sunday are excluded from the sample. The Homogeneous Sample refers to announcements by companies that announced earnings both on Friday and other weekdays at least ten percent of the time. The set of controls for the delayed response ratio calculation includes indicators for the year of announcement, the month of announcement, and the decile of a firm's market capitalization. Each control is also interacted with the indicator variable for the top quantile (or top two quantiles). The Delayed Response Ratio for each sample is computed as (Average (2,75) CAR for Quantile(s) j – Average (2,75) CAR for Quantile(s) k) / (Average (0,75) CAR for Quantile(s) j – Average (0,75) CAR for Quantile(s) k).

Figure 3: Average Monthly Return for Zero-Investment Drift Portfolios, Yearly Plot

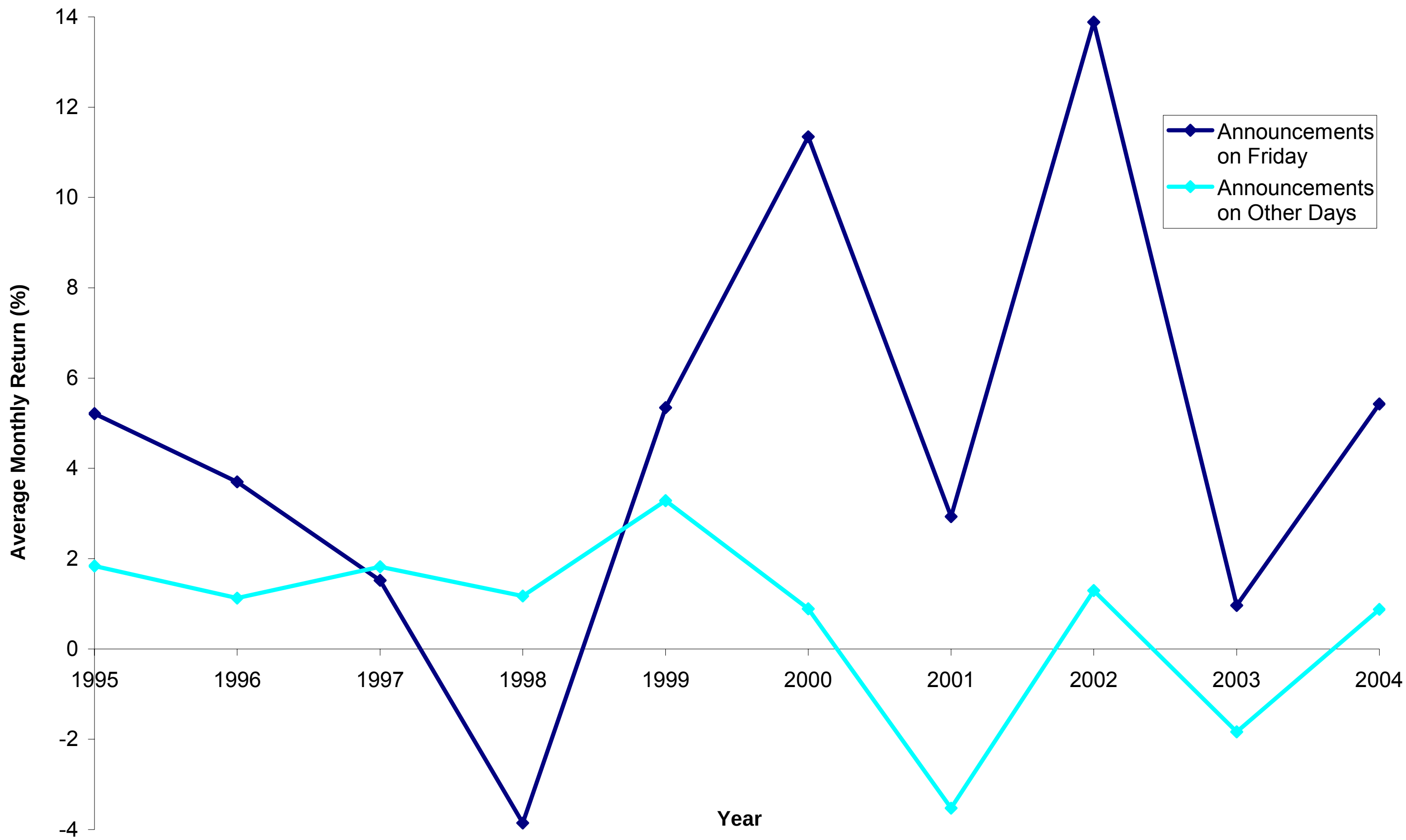


Figure 3. For each year we report the average monthly return for the zero-investment portfolio for announcements on Friday and for announcements on other weekdays. Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. The earnings surprise for an announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement. Quantiles 1 through 5 contain earnings announcements for five quintiles of negative earnings surprises and quantiles 7 through 11 contain earnings surprises for five quintiles of positive earnings surprises. Quantile number 6 contains all announcements with an earnings surprise equal to zero. Since the number of negative earnings surprises, the number of surprises equal to zero, and the number of positive earnings surprises are not equal, the number of observations in each quantile differ. Announcements made on Saturday or Sunday are excluded from the sample. The sorting mechanism uses the breakpoints for the quantiles determined by non-Friday announcements during the previous calendar year. At the end of calendar month t-1 the zero-investment drift portfolio for month t using Friday announcements (other weekdays) is created as follows. The strategy purchases stocks with earnings surprise announcements in the highest quantile and sells stocks with earnings surprises in the lowest quantile in month t-1. For a stock to be included in the one-month holding period strategy for calendar month t, the second trading day after the announcement must be in month t-1. If there are no stocks in a constituent portfolio, then that month is excluded from the analysis. Returns are equally-weighted within the constituent portfolios.

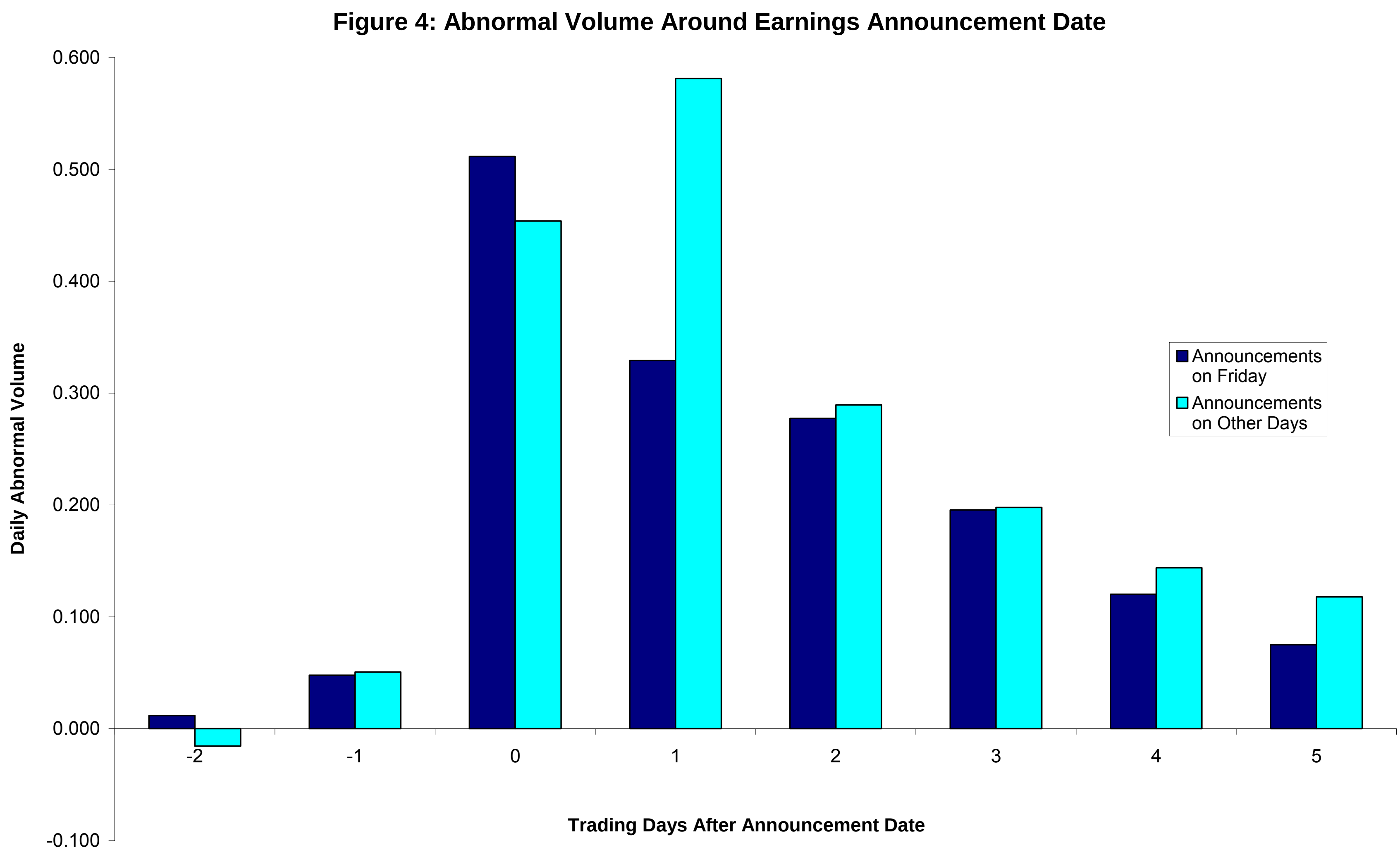


Figure 4. Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. In event time, day 0 is the day of the announcement. The abnormal volume for each stock is the average log volume on the day of and the day after the announcement, divided by the average log volume for the period -20 to -11 in event time (10 trading days). Announcements made on Saturday or Sunday are excluded from the sample.

Table I

Summary Statistics

Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. The earnings surprise for a quarterly announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement. Announcements made on Saturday or Sunday are excluded from the In Panel A we present the distribution of earnings announcements by weekday. In Columns 1-2 and 5-6 of Panel B we present summary statistics, with standard deviations in parentheses. In Column 3 of Panel B we present the difference between Columns 1 and 2, with standard errors for the difference. In Column 6 of Panel B we present the difference between Columns 4 and 5, with standard errors for the difference. The Homogeneous Sample refers to announcements by companies that announced earnings both on Friday and other weekdays at least ten percent of the time. The indicator for a large shareholder is available for only 57,924 observations. The entrenchment index is available for only 48,500 observations.

Panel A: Distribution of Earnings Announcements by Day of the Week

	All	Monday	Tuesday	Wednesday	Thursday	Friday
Number	121381	17032	31022	30919	35421	6987
Fraction	1.0000	0.1403	0.2556	0.2547	0.2918	0.0576

Panel B: Differences Between Announcements on Friday and Other Weekdays

	Baseline Sample			Homogeneous Sample		
	Friday	Non-Friday	Difference	Friday	Non-Friday	Difference
	(1)	(2)	(3)	(4)	(5)	(6)
Earnings surprise	-0.0043	-0.0011	-0.0033	-0.0048	-0.0017	-0.0031
	(0.0382)	(0.0244)	(0.0005)***	(0.0404)	(0.0261)	(0.0006)***
Market Cap ($M)	2440	3297	-857	2397	2467	-70
	(12600)	(14900)	(157)***	(13200)	(15300)	(215)
Year	1998.5600	1999.0760	-0.5160	1998.5680	1998.7970	-0.2290
	(2.6328)	(2.6384)	(.0324)***	(2.6137)	(2.6283)	(.0410)***
Month 1 in Quarter	0.5801	0.6259	-0.0458	0.5898	0.6002	-0.0104
	(0.4936)	(0.4839)	(.0061)***	(0.4919)	(0.4899)	(0.0077)
Month 2 in Quarter	0.3152	0.2936	0.0215	0.3138	0.3089	0.0049
	(0.4646)	(0.4554)	(.0057)***	(0.4641)	(0.4620)	(0.0072)
Month 3 in Quarter	0.1048	0.0805	0.0243	0.0965	0.0910	0.0055
	(0.3063)	(0.2720)	(.0037)***	(0.2953)	(0.2876)	(0.0046)
Large Shareholder	0.6555	0.6836	-0.0281	0.6569	0.6646	-0.0077
	(0.4753)	(0.4651)	(.0089)***	(0.4749)	(0.4721)	(0.0117)
Entrenchment Index	9.1338	9.0903	0.0435	8.9943	9.0867	-0.0924
	(2.7479)	(2.7461)	(0.0565)	(2.7801)	(2.8188)	(0.0748)
N	N = 6987	N = 114394	N = 121381	N = 5192	N = 18630	N = 23822

* significant at 10%; ** significant at 5%; *** significant at 1%

Table II

Differential Response for the Top and Bottom Quantiles

Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. In event time, day 0 is the day of the announcement. The cumulative abnormal return for each stock is the raw buy-and-hold return adjusted using the estimated beta from market model. The earnings surprise for an announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement. Quantiles 1 through 5 contain earnings announcements for five quintiles of negative earnings surprises and quantiles 7 through 11 contain earnings surprises for five quintiles of positive earnings surprises. Quantile number 6 contains all announcements with an earnings surprise equal to zero. Since the number of negative earnings surprises, the number of surprises equal to zero, and the number of positive earnings surprises are not equal, the number of observations in each quantile differ. The breakpoints for the quantiles are determined separately for each year.

The coefficients in the Table are evaluated at the average value of the controls. Columns 1, 2, 3, and 4 only include observations from the top quantile (11) and the bottom quantile (1). Columns 5 and 6 only include observations from the top two quantiles (10 and 11) or the bottom two quantiles (1 and 2). The standard set of controls includes indicators for the year of announcement, the month of announcement, and the decile of a firm's market capitalization. The additional earnings surprise volatility controls in Columns 3 and 6 are indicators for the decile of the company's earnings surprise standard deviation during the previous 4 years (requiring at least 4 observations). Whenever a group of controls is included in these regressions, each control is also interacted with the indicator variable for the top quantile (or top two quantiles).

Announcements made on Saturday or Sunday are excluded from the sample. The Homogeneous Sample refers to announcements by companies that announced earnings both on Friday and other weekdays at least ten percent of the time. Standard errors adjusted for heteroskedasticity and clustered by day of announcement are in parentheses.

Panel A: The Dependent Variable is the Cumulative Abnormal Return in Event Time From 0 to 1						
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.0365	-0.0384	-0.0373	-0.0332	-0.0328	-0.0337
	(0.0015)***	(0.0016)***	(0.0022)***	(0.0031)***	(0.0010)***	(0.0014)***
Friday	0.0053	0.0035	0.0055	0.0030	0.0035	0.0025
	(0.0047)	(0.0047)	(0.0052)	(0.0055)	(0.0031)	(0.0034)
Top Quantile	0.0659	0.0682	0.0695	0.0595		
	(0.0016)***	(0.0017)***	(0.0023)***	(0.0036)***		
(Top Quantile)*Friday	-0.0123	-0.0095	-0.0130	-0.0055		
	(0.0054)**	(0.0055)*	(0.0061)**	(0.0067)		
Top Two Quantiles					0.0578	0.0603
					(0.0011)***	(0.0015)***
(Top Two Quantiles)*Friday					-0.0109	-0.0100
					(0.0035)***	(0.0040)**
Standard Controls (Interacted)		X	X	X		X
Surprise Volatility Controls (Interacted)			X			X
Homogenenous Sample				X		
R^2	0.0797	0.0882	0.0952	0.0910	0.0763	0.0876
N	N = 20880	N = 20880	N = 16718	N = 5057	N = 41582	N = 33851

Panel B: The Dependent Variable is the Cumulative Abnormal Return in Event Time From 2 to 75						
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.0099	-0.0068	0.0145	-0.0227	-0.0056	0.0102
	(0.0074)	(0.0066)	(0.0080)*	(0.0108)**	(0.0052)	(0.0047)**
Friday	-0.0411	-0.0293	-0.0484	-0.0301	-0.0279	-0.0315
	(0.0179)**	(0.0163)*	(0.0181)***	(0.0197)	(0.0118)**	(0.0122)***
Top Quantile	0.0550	0.0523	0.0424	0.0423		
	(0.0072)***	(0.0069)***	(0.0087)***	(0.0130)***		
(Top Quantile)*Friday	0.0380	0.0327	0.0389	0.0527		
	(0.0185)**	(0.0179)*	(0.0204)*	(0.0220)**		
Top Two Quantiles					0.0455	0.0412
					(0.0045)***	(0.0050)***
(Top Two Quantiles)*Friday					0.0261	0.0282
					(0.0127)**	(0.0141)**
Standard Controls (Interacted)		X	X	X		X
Surprise Volatility Controls (Interacted)			X			X
Homogenenous Sample				X		
R^2	0.0047	0.0505	0.0526	0.0540	0.0038	0.0428
N	N = 20880	N = 20880	N = 16718	N = 5057	N = 41582	N = 33851

* significant at 10%; ** significant at 5%; *** significant at 1%

Table II (Cont.)

Differential Response for the Top and Bottom Quantiles and Delayed Response Ratio

Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. In event time, day 0 is the day of the announcement. The cumulative abnormal return for each stock is the raw buy-and-hold return adjusted using the estimated beta from market model. The earnings surprise for an announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement. Quantiles 1 through 5 contain earnings announcements for five quintiles of negative earnings surprises and quantiles 7 through 11 contain earnings surprises for five quintiles of positive earnings surprises. Quantile number 6 contains all announcements with an earnings surprise equal to zero. Since the number of negative earnings surprises, the number of surprises equal to zero, and the number of positive earnings surprises are not equal, the number of observations in each quantile differ. The breakpoints for the quantiles are determined separately for each year.

The coefficients in the Table are evaluated at the average value of the controls. Columns 1, 2, 3, and 4 only include observations from the top quantile (11) and the bottom quantile (1). Columns 5 and 6 only include observations from the top two quantiles (10 and 11) or the bottom two quantiles (1 and 2). The Response Ratios in Panel D are computed as the ratio of the Top-to-Bottom Return (2 to 75) from Table 2B and the Top-to-Bottom Return (0 to 75) from Table 2C. The standard set of controls includes indicators for the year of announcement, the month of announcement, and the decile of a firm's market capitalization. The additional earnings surprise volatility controls in Columns 3 and 6 are indicators for the decile of the company's earnings surprise standard deviation during the previous 4 years (requiring at least 4 observations). Whenever a group of controls is included in these regressions, each control is also interacted with the indicator variable for the top quantile (or top two quantiles).

Announcements made on Saturday or Sunday are excluded from the sample. The Homogeneous Sample refers to announcements by companies that announced earnings both on Friday and other weekdays at least ten percent of the time. Standard errors adjusted for heteroskedasticity and clustered by day of announcement are in parentheses.

Panel C: The Dependent Variable is the Cumulative Abnormal Return in Event Time From 0 to 75

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.0458 (0.0074)***	-0.0445 (0.0065)***	-0.0252 (0.0077)***	-0.0580 (0.0105)***	-0.0382 (0.0052)***	-0.0245 (0.0048)***
Friday	-0.0360 (0.0180)**	-0.0255 (0.0163)	-0.0434 (0.0176)**	-0.0239 (0.0199)	-0.0247 (0.0120)**	-0.0294 (0.0122)**
Top Quantile	0.1256 (0.0074)***	0.1233 (0.0072)***	0.1183 (0.0088)***	0.1048 (0.0132)***		
(Top Quantile)*Friday	0.0224 (0.0190)	0.0201 (0.0185)	0.0239 (0.0204)	0.0437 (0.0229)*		
Top Two Quantiles					0.1071 (0.0047)***	0.1060 (0.0054)***
(Top Two Quantiles)*Friday					0.0139 (0.0132)	0.0175 (0.0146)
Standard Controls (Interacted)		X	X	X		X
Surprise Volatility Controls (Interacted)			X			X
Homogenenous Sample				X		
R^2	0.0185	0.0628	0.0656	0.0663	0.0168	0.0548
N	N = 20880	N = 20880	N = 16718	N = 5057	N = 41582	N = 33851

Panel D: Ratio of the Delayed Stock Response (2 to 75) to the Long-term Stock Response (0 to 75)

	(1)	(2)	(3)	(4)	(5)	(6)
Response ratio for Friday announcements	0.6287 (0.0497)	0.5866 (0.0548)	0.5656 (0.0696)	0.6361 (0.0522)	0.5922 (0.0441)	0.5582 (0.0532)
Response ratio for announcements on other days	0.4380 (0.0335)	0.4188 (0.0334)	0.3539 (0.0492)	0.4003 (0.0774)	0.4252 (0.0251)	0.3860 (0.0297)
Difference between the response ratio for Friday and other days	0.1907 (0.0599)***	0.1678 (0.0627)***	0.2117 (0.0785)***	0.2357 (0.0913)***	0.1670 (0.0507)***	0.1723 (0.0592)***
Standard Controls (Interacted)		X	X	X		X
Surprise Volatility Controls (Interacted)			X			X
Homogenenous Sample				X		
N	N = 20880	N = 20880	N = 16718	N = 5057	N = 41582	N = 33851

* significant at 10%; ** significant at 5%; *** significant at 1%

Table III

Short-term Stock Price Response to an Earnings Announcement (Non-Linear Regressions)

Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. In event time, day 0 is the day of the announcement. The cumulative abnormal return for each stock is the raw buy-and-hold return adjusted using the estimated beta from market model. The earnings surprise for an announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement. Quantiles 1 through 5 contain earnings announcements for five quintiles of negative earnings surprises and quantiles 7 through 11 contain earnings surprises for five quintiles of positive earnings surprises. Quantile number 6 contains all announcements with an earnings surprise equal to zero. Since the number of negative earnings surprises, the number of surprises equal to zero, and the number of positive earnings surprises are not equal, the number of observations in each quantile differ. The breakpoints for the quantiles are determined separately for each year.

The standard set of controls includes indicators for the year of announcement, the month of announcement, and the decile of a firm's market capitalization. The additional earnings surprise volatility controls in Column 3 are indicators for the decile of the company's earnings surprise standard deviation during the previous 4 years (requiring at least 4 observations). The controls enter the non-linear regression in a proportional fashion.

Indicators for each earnings surprise quantile are included in all regressions. Announcements made on Saturday or Sunday are excluded from the sample. The Homogeneous Sample refers to announcements by companies that announced earnings both on Friday and other weekdays at least ten percent of the time. Estimates from NLS regressions are reported in each column. Standard errors adjusted for heteroskedasticity and clustered by day of announcement are in parentheses.

	Dependent Variable: Cumulative Abnormal Return in Event Time from 0 to 1					
	(1)	(2)	(3)	(4)	(5)	(6)
Friday (Proportional Effect)	-0.1874 (0.0514)***	-0.1633 (0.0530)***	-0.1861 (0.0561)***	-0.1552 (0.0517)***	-0.1252 (0.0737)*	-0.1521 (0.0616)**
Arctan Coefficient: φ_1				714.4450 (40.4694)***		
Arctan Coefficient: φ_2				0.0135 (0.0011)***		
Arctan Coefficient: φ_{pos}				0.2224 (0.0688)***		
Standard Controls		X	X	X	X	X
Surprise Volatility Controls			X			
Arctan Specification				X		
Homogeneous Sample					X	
Excludes Quantiles 1 and 11						X
R^2	0.0514	0.0530	0.0591	0.0548	0.0528	0.0400
N	N = 121381	N = 121381	N = 103443	N = 121381	N = 23822	N = 100501

* significant at 10%; ** significant at 5%; *** significant at 1%

Table IV

Performance of Post-Earnings Announcement Drift Portfolios

Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. The earnings surprise for an announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement. Quantiles 1 through 5 contain earnings announcements for five quintiles of negative earnings surprises and quantiles 7 through 11 contain earnings surprises for five quintiles of positive earnings surprises. Quantile number 6 contains all announcements with an earnings surprise equal to zero. Announcements made on Saturday or Sunday are excluded from the sample. The sorting mechanism in the portfolio strategies analyzed below uses the breakpoints for the quantiles determined by non-Friday announcements during the previous calendar year.

At the end of calendar month t-1 the zero-investment drift portfolio for month t using Friday announcements (other weekdays) is created as follows. The strategy purchases stocks with earnings surprise announcements in the highest (or highest two) quantile(s) and sells stocks with earnings surprises in the lowest (or lowest two) quantile(s) in month t-1. The return for the differential drift portfolio is the difference between the return of the drift portfolio for Friday announcements and the return of the drift portfolio for non-Friday announcements. For a stock to be included in the one-month holding period strategy for month t, the second trading day after the announcement must be in month t-1. For a stock to be included in the two-month holding period drift strategy for month t, the second trading day after the announcement must be in month t-1 or in month t-2. If there are no stocks in a constituent portfolio, then that month is excluded from the analysis. Returns are equally-weighted within the constituent portfolios.

Columns 1 through 6 report the coefficients of OLS regressions of the differential drift portfolio monthly returns from January 1995 to June 2004 on monthly factors. VWRF is the return on the CRSP value-weighted stock index minus the 1-month treasury rate. SMB, HML, and UMD are the returns on the factor-mimicking portfolios for size, book-to-market and momentum, respectively. The constant is the average monthly risk-adjusted return. Heteroskedasticity and autocorrelation consistent standard errors are calculated using the Newey-West estimator with 6 lags (in parentheses). Columns 1 and 2 report results for the baseline specification. Column 3 reports results where the non-Friday drift portfolio only uses the non-Friday announcements that match the earnings surprises in the Friday drift portfolio (see details below). Column 4 reports results using the top two and bottom two quantiles. Column 5 reports results using a two month holding period. Column 6 reports results for a decile sorting procedure that is analogous to the baseline methodology where the breakpoints for the top and bottom groups are determined by sorting earnings surprises into deciles during the previous calendar year.

The portfolio strategy in column 3 (matched sample) is designed to address the concern that the stocks in the constituent Friday portfolios have more extreme earnings surprises than the stocks in the constituent non-Friday portfolios. For every stock with a Friday earnings announcement in the bottom (top) quantile for month t-1 we find the five non-Friday announcements in the same quantile and month with the closest earnings surprise to the Friday announcement subject to the constraint that non-Friday surprises must be larger in absolute value (more extreme). If there are fewer than five non-Friday announcements with more extreme earnings surprises than a specific Friday announcement, the returns of the stocks with these non-Friday announcements are overweighted appropriately. Friday announcements that can not be matched to at least one non-Friday announcement with a more extreme earnings surprise are excluded from the analysis. Only announcements in this matched sample are used for the analysis in column 3.

	Dependent Variable: Monthly Return on the Zero-Investment Portfolio					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.0438 (0.0133)***	0.0543 (0.0178)***	0.0635 (0.0300)**	0.0315 (0.0090)***	0.0214 (0.0099)**	0.0362 (0.0102)***
VW Index Excess Return (VWRF)	-0.6367 (0.3071)**	-1.2076 (0.3184)***	-0.7025 (0.5573)	-0.5567 (0.2107)***	-0.5925 (0.2540)	-0.6757 (0.2494)***
Size Factor Return (SMB)		-0.0187 (0.4665)	0.5973 (0.7706)	-0.2295 (0.2481)	-0.1502 (0.2936)	0.0066 (0.2667)
Value Factor Return (HML)		-0.9185 (0.6388)	-1.6801 (0.8046)**	-0.3735 (0.3365)	-0.7872 (0.2823)	-0.3435 (0.3683)
Momentum Factor Return (UMD)		-0.3616 (0.3412)	-0.8668 (0.7306)	-0.1436 (0.1710)	-0.0372 (0.2514)	-0.3235 (0.2082)
One month holding period	X	X	X	X		X
Two month holding period					X	
Top minus bottom quantile	X	X	X		X	X
Matched sample			X			
Top two minus bottom two quantiles				X		
Top minus bottom decile						X
R^2	0.0411	0.0862	0.1191	0.0655	0.0694	0.0551
N	N = 104	N = 104	N = 104	N = 108	N = 114	N = 107

* significant at 10%; ** significant at 5%; *** significant at 1%

Table V

Short-term Volume Response to an Earnings Announcement

Stocks in CRSP are matched to quarterly earnings announcements in I/B/E/S from January 1995 until June 2004. In event time, day 0 is the day of the announcement. The abnormal volume for each stock is the average log volume on the day of and the day after the announcement, divided by the average log volume for the period -20 to -11 in event time (10 trading days). The aggregate abnormal volume is computed in a similar manner using volume for the whole market. The earnings surprise for an announcement is the difference between actual earnings for the quarter recorded by I/B/E/S and the median analyst forecast included in the I/B/E/S detail file during the 30 days before the quarterly earnings announcement scaled by the stock price 5 trading days before the announcement.

Quantiles 1 through 5 contain earnings announcements for five quintiles of negative earnings surprises and quantiles 7 through 11 contain earnings surprises for 5 quintiles of positive earnings surprises. Quantile number 6 contains all announcements with an earnings surprise equal to zero. Since the number of negative earnings surprises, the number of surprises equal to zero, and the number of positive earnings surprises are not equal, the number of observations in each quantile differ. Indicators for each earnings surprise quantile are included in all regressions. The standard set of controls includes indicators for the year of announcement, the month of announcement, and the decile of a firm's market capitalization. The additional earnings surprise volatility controls in Column 4 are indicators for the decile of the company's earnings surprise standard deviation during the previous 4 years (requiring at least 4 observations).

Announcements made on Saturday or Sunday are excluded from the sample. The Homogeneous Sample refers to announcements by companies that announced earnings both on Friday and other weekdays at least ten percent of the time. Estimates from OLS regressions are reported in each column. Standard errors adjusted for heteroskedasticity and clustered by day of announcement are in parentheses.

	Dependent Variable: Abnormal Volume in Event Time from 0 to 1					
	(1)	(2)	(3)	(4)	(5)	(6)
Friday	-0.1052 (0.0174)***	-0.1243 (0.0146)***	-0.0480 (0.0148)***	-0.0477 (0.0144)***	-0.0669 (0.0167)***	-0.0432 (0.0162)***
Aggregate Abnormal Volume						0.3457 (0.0412)***
Earnings Surprise Quantiles	X	X	X	X	X	X
Standard Controls		X	X	X	X	X
Surprise Volatility Controls				X		
Company Fixed Effects			X	X	X	X
Homogeneous Sample					X	X
R^2	0.0072	0.0297	0.1897	0.1904	0.1956	0.1996
N	N = 121179	N = 121179	N = 121179	N = 103332	N = 23735	N = 23735

* significant at 10%; ** significant at 5%; *** significant at 1%

Appendix Table I

Accuracy of the Imputed Date for Earnings Announcements

Newswire searches using Lexis-Nexis provide the actual date for the earnings announcement. The imputed date for the earnings announcement is generated from the recorded announcement dates in Compustat and I/B/E/S using a simple algorithm. The algorithm is described in the text and is designed to maximize the match between imputed and actual dates in the sample of 2614 observations randomly selected for a newswire search.

	Imputed Announcement Date Before Actual (Newswire) Date		Same Date	Imputed Announcement Date After Actual (Newswire) Date			
Difference in Trading Days	-2	-1	0	1	2	Other	Total
				Panel A: Years 1984 to 1989			
Number of Imputed Friday Announcements	0 0.0%	49 24.5%	88 44.0%	57 28.5%	2 1.0%	4 2.0%	200 100.0%
Number of Imputed Non-Friday Announcements	2 0.4%	93 18.1%	344 66.8%	60 11.7%	8 1.6%	8 1.6%	515 100.0%
				Panel B: Years 1990 to 1994			
Number of Imputed Friday Announcements	0 0.0%	4 1.3%	204 65.2%	101 32.3%	4 1.3%	0 0.0%	313 100.0%
Number of Imputed Non-Friday Announcements	1 0.3%	2 0.6%	326 93.1%	19 5.4%	1 0.3%	1 0.3%	350 100.0%
				Panel C: Years 1995 to 2004			
Number of Imputed Friday Announcements	0 0.0%	16 2.4%	632 95.8%	11 1.7%	0 0.0%	1 0.2%	660 100.0%
Number of Imputed Non-Friday Announcements	1 0.2%	13 2.3%	546 97.0%	2 0.4%	0 0.0%	1 0.2%	563 100.0%