

# **Investor Under-reaction to Earnings Announcement and 10-K Report**

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## **Abstract**

We compare investor response to two sequential public disclosures: earnings announcements and 10-K reports. Overall investor reaction to these information releases appears sluggish in that future stock prices continue to drift in the same direction as the immediate market response. We find that the magnitude of such drift is larger for 10-K reports compared to that for earnings releases. In addition, as the time gap between these two information releases lengthens, the magnitude of the delayed response to 10-K increases. At the same time, the immediate market response to 10-K filings gets weaker. Collectively the evidence suggests that the way financial information is released to investors affects their usage of such information. In particular, investors tend to react more to information that is presented in a more salient manner (such as the earning release). Longer time gaps between earnings announcements and 10-K filings seem to reduce investors' attention and increase investors' uncertainty about the informativeness of 10-K, causing investors to react less to such information.

**Key words:** stock price drift; earnings; 10-K; cognitive bias

# 1. Introduction

When companies issue their financial reports, they often do so in two steps: At the earnings announcement date management reports key performance measures such as earnings per share, sales growth, and operating profit. Later on, the 10-K report is filed with SEC containing detailed information such as footnotes, management discussions and analysis, and the statement of cash flows. This two-step procedure of information release provides an interesting opportunity to study how such a divided information flow affects investors' ability to incorporate information from the two releases to value the stock.

It is commonly believed that as long as a firm releases all the required information to the public, and as long as such information release is done within the time frame allowable by the SEC, it should not matter whether the firm releases the information in one step or two steps, or whether a piece of information is release at earnings announcement or in 10-K filing. However, our evidence suggests the opposite.

We find that investors tend to under-react more to 10-K information as compared to information in the earnings release. Consistent with prior findings (e.g., Ball and Brown 1968, Bernard and Thomas 1989, Chan *et. al.* 1996), investors' reaction to information in both earnings release and 10-K appears sluggish in that future stock prices continue to drift in the same direction as the immediate market response to the information. Delayed reaction to earnings release constitutes about 12% of total market reaction over the 12 month period after earnings release, whereas for 10-K filings the ratio is 41%. A multivariate regression further shows that for every 1% of immediate market reaction to 10-K, there is a delayed response of about 0.7%. In contrast, the magnitude of delayed response to the earnings release is about 0.1%.

In addition, the time lag between earnings release and 10-K filing also seems to matter. The gap between the two information releases (hereafter referred to as GAP) can be quite lengthy for most public firms. For our sample, which consists of all public firms filed with SEC during the past decade, the median length of the gap is 44 days. More than 5% of the time firms file 10-K over 70 days after earnings announcements. This is quite a delay considering that the firm has almost all the information at the time earnings are released.

We find that investors tend to under-react more to financial information when the time gap between the two information releases is lengthy. For each year, we combine firms into three groups based on the length of time between earnings release and 10-K filing. For firms with a long disclosure gap, the magnitude of stock price drift is about 9.67%. In contrast, for firms with a short disclosure gap, the magnitude of such a drift is considerably less, only about 4.91%.

To pinpoint why the time lag causes the return difference, we examine several possible determinants of GAP. Our analysis reveals that bigger firms tend to have a longer time gap. In addition, the length of the time gap tends to vary across industries. In order to control for the difference in size and industry, for each year we first sort firms in the same industry into different size groups. Then within each year-industry-size group we combine firms based on GAP and check for the magnitude of price drift. The results show, after controlling for size and industry, the return drift for firms with longer GAP equals 10.49%, while the return difference for firms with a shorter gap is about 3.15%. Thus the difference between firms with long and short time gap is not driven mostly by size and industry factors.

Our analysis further reveals that the difference in under-reaction is due mainly to the difference in investors' reaction to information in 10-K. Specifically, in a multivariate regression of future 12-month abnormal returns using the earnings release and 10-K filing window returns, as well as the length of the timing gap, only the interaction term between GAP and 10-K filing window return is significant. Under-reaction to earnings release also seems to vary across different groups of firms with different GAP, but the difference does not appear to be significant. This suggests the possibility that firms with longer GAP may release more information in 10-K, causing investors to under-react. You and Zhang (2007) conducted a cross-sectional test and show that information complexity in 10-K affects investor under-reaction to such information. We use their measure to control for the amount and complexity of information in 10-K in the cross-sectional regression. The result shows that, although information complexity affects investor under-reaction, the time lag between earnings release and 10-K filing has significant incremental impacts.

Based on the above evidence, we propose the following explanation for the phenomenon. Research on cognitive psychology has shown that people tend to give more attention to evidence that is salient, and less to evidence that appears abstract and uncertain (Lichtenstein and Fischhoff 1977, Quattrone 1982, Kahneman, Slovic and Tversky 1982, Greffin and Tversky 1992). This is a result of investors constantly allocating their limited attention among alternative news sources. When earnings are released at the announcement date, such news is often widely spread by the media, and key information is summarized in hard-to-miss headlines. In contrast, when 10-Ks are filed, most people often do not pay attention. In addition, the nature of the information in

10-K caused the perceived processing cost to be high. Deciphering information on topics such as hedging, option expensing, and pension requires special training and skills. This may cause investors to under-react more to 10-K information.

Late filing of 10-K also makes it more likely for investors to under-react to such information, for two reasons: First, earnings release is more salient and gets more investor attention. As time passes by, investors are more likely to shift attention to other stocks with more eye-catching news events. Second, as the time lag lengthens investors become more and more unsure of whether information released in 10-K are new, or have been incorporated into price during the time lag by means of information leakage, private information collection, or disclosure of related information items. This makes the informativeness of the 10-K information more uncertain. Collectively, these two factors render 10-K information less salient and more uncertain, causing investors to under-react to it. This tendency holds for both investors who extract information from 10-K, as well as those investors who try to second-guess the information based on observed price movement after 10-K filing.

We further test the above hypothesis by examining whether in fact investors tend to react less to 10-K information when the time gap is large. We use the absolute stock return around 10-K filing dates to measure investor reaction to such information. A multivariate regression indicates that investor reaction does diminish as the time gap increases. In addition, we test whether the recent SEC ruling on shortening the filing time also corresponds to a reduction in under-reaction. Starting in 2004 firms classified as accelerated filers (most firms with 75 million or more market cap) are required to file 10-K within 75 days after fiscal year end (instead of the 90 days before). Our test shows

that under-reaction does seem to decrease for these two years, compared to the other years. However the coefficient from a multivariate regression is not significant.<sup>1</sup>

The issue of how to get information to investors in a timely, easy-to-understand fashion has always been a primary concern of the regulatory agencies. In recent years, SEC accelerated the filing deadline for 10-K, 10-Q, and 8-K.<sup>2</sup> Such a change to shorten the filing time met with strong resistance from firms and accounting professionals. Opponents to this ruling question the benefit investors can get from such changes. Our study provides some preliminary evidence supporting the acceleration of filing deadlines. In addition, the evidence on the greater under-reaction to 10-K information also suggests that further actions by the accounting professionals to summarize information more effectively into key, easy-to-understand measures can be welfare enhancing.

## **2. Related literature**

This paper belongs to a large literature on understanding investor reaction to accounting information. Early studies on this issue document significant market reaction to earnings news, indicating non-trivial information content being released to the market (e.g. Ball and Brown 1968, Beaver 1968, Foster and Vickrey 1978, Cready and Mynatt 1991, Stice 1991, Easton and Zmijewski 1993). At the same time, evidence also suggests that investors do not fully incorporate such information into pricing (e.g., Ball and Brown 1968, Bernard and Thomas 1989). More recent studies analyze investor reaction to corporate filings with SEC (e.g., Qi, Wu and Haw 2000, Griffin 2003, You and Zhang

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<sup>1</sup> This could be resulting from lack of power due to short sample period with reduced filing time. It might also indicate that shortening the dates from 90 to 75 may not be enough to induce more significant change in investors' attention.

<sup>2</sup> SEC final rules 33-8128, 33-8128a, proposed rule 33-8617, and final rule 33-8644.

2007). Our study extends the literature by examining how the magnitude of investor under-reaction varies with the nature of information release (earnings versus 10-K), as well as the time gap between the two. It also adds evidence to the literature on the economic impact of accounting recognition versus disclosure (see, for example, Bernard and Schipper 1994, Aboody 1997, Barth et. al. 2003, Ahmed et. at. 2006).

Several recent papers also examine the issue of how information complexity and information uncertainty affect investor comprehension of information. Jiang et. al. (2005), Zhang (2006), and Francis et. al. (2007) use firm specific variables such as size, stock price volatility, analyst following, and the earnings quality measure of Dechow and Dechow (2002) as proxies for information uncertainty. You and Zhang (2007) use the length of 10-K as a proxy for complexity and show that investors under-react more to relatively more complicated 10-K reports. Unlike these studies, we compare investor under-reaction to earnings release and 10-K. This approach effectively uses each firm as its own control, mitigating potential concern about omitted variables that correlate with the proxies (such as size and price volatility) used in prior studies. Moreover, such an approach pinpoints how the format and timing of information release affects investor reaction.

Our paper also builds on the prior findings from cognitive research. Griffin and Tversky (1992) first documented in a series of experiments that people tend to put more weight on evidence that forms a strong impression on the basis of limited knowledge. Their proposition synthesizes many of the earlier findings of over-confidence and under-confidence in people's behavior (e.g., Kidd 1970, von Holstein 1972, Wagennar and Keren 1986). More recently, empirical studies in finance also document the effect of



overconfidence in stock market settings (Odean 1998, Daniel et. al. 1998, Shleifer 2000, and references therein). In this paper we explore whether such a cognitive behavior might help explain investors' differential under-reaction to financial information in earnings release and 10-K.

### **3. Investors under-reaction to earnings release and 10-K filing**

#### **3.1. Sample**

Our sample is constructed based on all the 123,449 electronic 10-K filings (including 10-K405, 10-KSB, 10-KSB405) from January 1, 1995 to December 31, 2005.<sup>3</sup> We use a dataset provided by the Xignite Inc. and another dataset from Compustat to merge the 10-K filings with the 2007 CRSP and Compustat database. This yields 65,664 firm-year observations. We further eliminate 4,646 observations on securities other than common stocks, as well as 1,146 observations where 10-K filings occur more than 120 days after fiscal year end. Since our base dataset also includes 10-K filings by small business (SB), it may cause concern as to whether any market under-reaction we document is due to extreme stocks with very low liquidity. To control for the impact of low-liquidity stocks we also exclude firm-year observations with a market cap less than 200 million or stock price less than \$1 (i.e., the penny stocks).<sup>4</sup> The final sample consists

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<sup>3</sup> Mandatory electronic filing was fully phased in at the end of 1995. SB stands for small business, which, according to the SEC, refers mainly to entities with revenue less than 25 million. There is no difference in substance between form 10-K and 10-K405, except where the Rule 405 box on the facing page of the Form 10-K is checked. Checking the box indicates that no disclosure of delinquent ownership reports is required. This classification was discontinued in 2002 after the SEC determined that the use of this designation by companies was inconsistent and unreliable.

<sup>4</sup> Exclusion of small stocks is done before portfolios are formed to avoid potential hindsight bias. Sensitivity tests based on stock price cut-off at \$5 or \$10 yield similar results.

of 23,738 firm-year observations. Details of this sample selection procedure are outlined in Table 1.

Some statistics for our sample firms are provided in Table 2. The median firm size, measured as the logarithm of market value of common equity, is 6.711, suggesting a median market cap of about \$821 million. The first and third quartile of market caps are about \$386 and \$2,830 million respectively. The mean (median) book-to-market ratio for our sample is 0.439 (0.395).

### 3.2. Investor reaction to financial information

We use the excess stock return around earnings announcement dates and 10-K filing dates to measure investor reaction to these information releases. Specifically, we measure the abnormal stock price changes around 10-K filing dates by subtracting the corresponding size decile return from each stock's raw return. For firm  $i$  in year  $t$ , the filing dates return (FDR) equals:

$$FDR_{i,t} = \prod_{\tau=0}^2 (1 + Ret_{i,t,\tau}) - \prod_{\tau=0}^2 (1 + Decret_{i,t,\tau})$$

where  $Ret_{i,t,\tau}$  is the return on stock  $i$  on date  $\tau$  relative to the firm's year  $t$  10-K filing day.  $Decret_{i,t,\tau}$  is the day  $\tau$  average return of all firms in the size decile to which firm  $i$  belongs to during year  $t$ . Similarly, we use the three-day return to measure the earnings announcement return (EAR). However, unlike 10-K filing, earnings release dates are mostly anticipated (especially in recent years where such information can be easily obtained from a number of web sites). To control for information leakage documented in

prior literature, we measure the three-day return (EAR) starting with date -1, i.e., the day before the earnings announcement date:

$$EAR_{i,t} = \prod_{\tau=-1}^1 (1 + Ret_{i,t,\tau}) - \prod_{\tau=-1}^1 (1 + Decret_{i,t,\tau})$$

Distribution of EAR and FDR are reported in Table 2 as well. Investor reaction to earnings release seems larger compared to reaction to 10-K. The standard deviation of abnormal market return around earnings release is 0.076, as compared to the standard deviation around 10-K dates, which is 0.054. The inter-quartile range of EAR is 0.069, also larger than that of FDR, which is 0.046.

Prior research has documented significant investor under-reaction to accounting information (Ball and Brown 1968, Bernard and Thomas 1989). We use the sum of EAR and FDR (labeled EAFDR) as a proxy for the net amount of information in financial reports (earnings announcement plus 10-K). Each year we rank firms based on the magnitude of EAFDR and arrange them in five groups based on the quintile breakpoints from the prior year's EAFDR distribution. We then track the portfolio stock return over 12 months, starting the month after the 3 day 10-K filing window. The result is plotted in Figure 2. It is clear that firms with higher EAFDR outperform those with lower EAFDR. The size-adjusted abnormal return for the highest EAFDR group is about 4.14% over the twelve months following the filing window. In contrast, the abnormal return over the same period for the quintile with the lowest EAFDR is -2.84%.

As in prior studies, we control for various known risk factors such as size and book-to-market. In addition, we also conduct tests to make sure that the documented price drift is not a replica of anomalies documented in earlier studies, such as Sloan (1996). We estimate the following models:

$$BHAR\_12M_{i,t} = \alpha_0 + \alpha_1 EAFDR_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$BHAR\_12M_{i,t} = \alpha_0 + \alpha_1 EAFDR_{i,t} + \alpha_2 BETA_{i,t} + \alpha_3 SIZE_{i,t} + \alpha_4 BM_{i,t} + \alpha_5 MOM_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$BHAR\_12M_{i,t} = \alpha_0 + \alpha_1 EAFDR_{i,t} + \alpha_2 BETA_{i,t} + \alpha_3 SIZE_{i,t} + \alpha_4 BM_{i,t} + \alpha_5 MOM_{i,t} + \alpha_6 SUE_{i,t} + \alpha_7 ACC_{i,t} + \varepsilon_{i,t} \quad (3)$$

where  $BHAR\_12M$  = cumulative size-adjusted returns for the twelve months starting from the month after the filing window;

$EAFDR$  = EAFDR is the sum of EAR and FDR where there is at least a one day gap between earnings announcement dates and filing dates, otherwise EAFDR equals to EAR;

$BETA$  = market risk beta calculated with monthly stock returns over the 36 months before the filing month;

$SIZE$  = the logarithm of the market capitalization as of the filing date;

$BM$  = the book value of equity divided by the market value of equity as of the fiscal year end;

$MOM$  = the six months raw returns ending on the filing month (Jegadeesh and Titman 1993, Chan, Jegadeesh and Lakonishok 1996);

$ACC$  = the difference between earnings from continuing operations (COMPUSTAT #123) and cash flow from continuing operations (COMPUSTAT #308 - #124) scaled by the average total assets;

$$SUE = \frac{E_q - E_{q-4} - c_q}{\sigma_q} \text{ with } E_q \text{ equals the earning before extraordinary item}$$

(COMPUSTAT QUARTERLY #8) for quarter  $q$ .  $c_q$  is the mean and  $\sigma_q$  is the standard deviation of the seasonally differenced earnings over the past eight quarters. For every year we use only the fourth quarter SUE in the regression models.

These models are estimated using a pooled, cross-sectional time-series regression and report the *t*-statistics based on White standard errors that are robust to within cluster correlation (Petersen, 2007). The results are reported in Table 3. Year dummies are also included in the regression, but the coefficients are seldom significant. The coefficients on EAFDR are significant in all three specifications even after controlling for various risk factors, as well as the accrual measure and SUE. This is consistent with the findings of prior studies (e.g., Fama 1998, Chordia and Shivakumar 2006) supporting the robustness of this type of phenomena.

### **3.3. Comparing investor under-reaction to earnings release and 10-K filing**

We repeat the above portfolio analysis for EAR and FDR separately. Similar to the EAFDR strategy, each year we sort firms into EAR (FDR) groups by comparing the current year EAR (FDR) with the quintile breakpoints of the EAR (FDR) distribution from the prior year. We then track the stock return performance for firms in each quintile over a twelve-month period starting from the month after the three-day 10-K filing window. The percentage of delayed response is calculated for the hedge portfolio, constructed from buying firms in the highest EAR (FDR) quintile and selling firms in the lowest EAR (FDR) quintile. It is calculated as follows:

$$PCT\_DRIFT = \frac{BHAR\_12M}{EAR + BHAR\_12M}$$

where BHAR\_12M is the average buy and hold size-adjusted return over the twelve months subsequent to the earnings announcement window for the portfolio.

The results are provided in Panels A and B of Table 4. For the EAR hedge portfolio, 12.07% of the market reaction occurs during the twelve months following the

earnings announcement. In contrast, the delayed response to information contained in 10-K filings accounts for about 40.52% of the total market reaction.

The higher percentage of drift can also be caused by the fact that market reaction is, on average, smaller around 10-K filing dates compared to the reaction on earnings announcement dates. If, for the sake of argument, the drift in stock returns is merely due to under-reaction to earnings, then the fact that abnormal returns are smaller in magnitude for 10-K announcements would translate into a higher percentage of drift. To address this concern we further conduct the following multivariate regression:

$$BHAR_{i,t} = \beta_0 + \beta_1 FDR_{i,t} + \beta_2 EAR_{i,t} + \varepsilon_{i,t} \quad (4)$$

where  $BHAR_{i,t}$  is the size-adjusted return for the twelve months after the filing window.<sup>5</sup>

The result is provided in Panel C of Table 4. Consistent with the portfolio test results in Panel A and B, the coefficient on FDR (0.721) suggests that for each 1% of immediate market reaction to 10-K information there is about 0.7% delayed response. In contrast, the magnitude of the coefficient on EAR is insignificant, with magnitude being about one sixth of that of FDR. The result further indicates that the drift in stock return reflects more under-reaction to FDR than under-reaction to EAR.

Since we use abnormal stock return to measure the information content of earnings and 10-K, a natural question is the extent to which our results mirror the prior finding of the momentum effect. Specifically, if the stock price drift is due to momentum rather than under-reaction to financial information, the significance of FDR might simply reflect the fact that FDR represents more recent stock movements compared to EAR.

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<sup>5</sup> To avoid overlap between EAR and FDR, equation (4) is estimated based on 22,826 observations where this is at least a one day gap between the earnings announcement and 10-K filing dates. Very similar result is obtained when (4) is estimated using the full sample.

However, prior research (Chan et. al. 1996, Chordia and Shivakumar 2006) shows that the earnings momentum effect tends to subsume the price momentum effect.

Nonetheless, we conduct two additional tests to address this issue. First, for EAR portfolios, we start the return accumulation the month after earnings are released as opposed to starting after 10-K filing. The results are very similar to those reported in Panels A & B. The percentage drift for EAR equals to 16.34%, while the percentage drift for FDR is 40.09%. In the second test we calculate the following Pseudo-EAR and Pseudo-FDR for each firm year. Specifically, we measure EAR and FDR 10 days before the information release date. If price momentum is the driving force behind our findings, we would expect similar results using such Pseudo-EAR and Pseudo-FDR in regression (4). The result is presented in Panel D of Table 4. Neither of the two Pseudo measures has predictive power over future stock returns. Collectively, this evidence suggest that investors under-react more to information in 10-K as compared to information in earnings announcements.

#### **4. Time gap and investor reaction to financial information**

The other issue we address in this study is the time gap between earnings announcement and 10-K filing. Considering that fact that firms have most of the financial results at the time of earnings release, it is interesting to observe that firms wait for months before disclosing the rest of the information to investors. Next we present some evidence regarding how this gap in information release might affect investor reaction to financial information.

#### 4.1. Time gap between earnings release and 10-K filing

Distribution of GAP, the number of days between earnings releases and 10-K filing, is also reported in Table 2. The mean (median) is 42 (44) days. The standard deviation is about 18 days. The exact distribution of GAP is plotted in Figure 1. As we can see, most firms file their 10-K more than 30 days after they announce their earnings. In more than 75% of the cases, 10-K filing occurs more than 55 days later.

Figure 3 plots the persistence of GAP over time. It seems that the length of the time gap exhibits a certain degree of mean-reversion over time. However, for the most part, the difference in GAP across firms tends to be rather persistent.

It is very likely that a firm's choice of when to announce earnings and when to file 10-K be influenced by the existing industry practice. We group firms based on the two digit SIC code and compare the distribution of GAP across industries. The medians of GAP across industries are plotted in Figure 4. It is apparent that GAP varies systematically across industries. The medians of GAP range from 21 days (for the Construction – special trade industry) to 58 days (for Depository Institutions).

Besides industry, firm size may also affect GAP. Bigger firms may have larger GAP since they need more time to finalize their 10-K due to the complexity of their operation. In addition, the book-to-market ratio, which indicates the asset composition (tangible versus intangible) as well as the growth potential of firms, may also correlate with GAP. We run the following multivariate regression of GAP on size and book-to-market:

$$GAP = \alpha_0 + \alpha_1 SIZE + \alpha_2 BM + \varepsilon \quad (5)$$



Results of the above regressions are reported in Table 5. All the regression models show that SIZE has positive and significant correlation with gap, indicating that larger firms usually take a longer time to prepare and file the detailed annual reports than smaller firms. Book-to-market, on the other hand, does not seem to correlate with GAP in any significant way.

The significant delay in releasing detailed accounting information naturally raises the question of whether that impacts investor comprehension of such information. We address this issue next.

#### **4.2 Time gap and stock price drift**

For each year, we sort stocks in three groups based on the length of the time gap between earnings release and 10-K filing. Within each group we form five portfolios based on the magnitude of EAFDR and then compare the magnitude of the stock price drift for each GAP group (long, medium, and short). The results are reported in Panel A of Table 6. Consistent with the results in Table 3 and Figure 1, portfolios with the highest EAFDR outperform the corresponding portfolios with the lowest EAFDR for all the three GAP groups for six- and twelve-month holding periods. Furthermore, the magnitude of stock return drift is larger for groups with longer gaps between earnings announcements and 10-K filing. For example, the total drift (defined as hedge returns between the two extreme EAFDR portfolios) for a twelve-month holding period is 4.91% for groups with the shortest time gaps. The drift increases to 6.64% for medium gap groups, and to 9.67% for the longest time gap group. Overall, the longer the gap, the more investors seem to under-react to financial information.

To control for the correlation of gap with size and other industry factors, we repeat the above analysis with sequential sorting. Specifically, we first group firms according their size within each year-industry. Then firms are divided into long, medium, and short gap groups based on their GAP within each year-industry-size group. The result is reported in Panel B of Table 6. The post-filing drift gets stronger after controlling for industry and size, especially for medium and long gap groups. The twelve-month hedge returns for the medium group increase from 6.64% in Table 4 to 7.01%. The drift for the long gap groups increases from 9.67% to 10.49%. The effect of GAP on the strength of GAP remains significant after controlling for size and industry.

We further conduct the following multivariate regression analysis to confirm the above results:

$$BHAR_{12M} = \alpha_0 + \alpha_1 EAFDR + \alpha_2 GAP + \alpha_3 GAP * EAFDR + \varepsilon \quad (6)$$

If GAP does have an impact on the degree of investor under-reaction to financial information disclosure,  $\alpha_3$  should be positive and significant.

The regression results are reported in the first column of Panel A, Table 7. The results confirm our findings in Table 4 and Panel B of Table 6. The coefficient on  $GAP * EAFDR$  is positive and significant, suggesting that the degree of investor under-reaction is stronger for firms with longer gap between earnings announcements and 10-K filings. The coefficient on  $EAFDR$  is actually insignificant, which is consistent with our prior findings that there is little, if any, under-reaction to financial information for firms with short GAP between earnings announcements and 10-K filings.

We repeat regression (6) with Pseudo-EAR and Pseudo-FDR measured 10 days before the corresponding information release (see section 3.3 for more details). The result

is presented in Panel B of Table 7. Neither Pseudo-EAFDR nor GAP\*Pseudo-EAFDR shows significant correlation with future stock return. This indicates that the predictive power of GAP is not driven by stock price momentum. Instead it is more likely due to investor reaction to earnings announcements and 10-K reports.

### 4.3. Time gap and under-reaction to 10-K

Since EAFDR measures the combined information of earnings announcement and 10-K filings, we further investigate whether GAP influences investor under-reaction to the two sources of information similarly. We break up EAFDR into EAR and FDR in the multivariate regression:

$$\begin{aligned}
 & BHAR\_12M \\
 & = \beta_0 + \beta_1 GAP + \beta_2 EAR + \beta_3 FDR + \beta_4 GAP * EAR + \beta_5 GAP * FDR + \varepsilon
 \end{aligned}
 \tag{7}$$

The results are reported in Column II of Panel A, Table 7. The impact of gap on investor under-reaction is mainly due to its impact on investor under-reaction to 10-K information. The interaction term of GAP and EAR is not significant, whereas the interaction term of gap and FDR is highly significant indicating that the longer the gap between earnings and 10-K filing, the more investors seem to under-react to 10-K information.

### 4.4 Time gap and information complexity of 10-K

You and Zhang (2007) show that investor under-reaction to 10-K is a function of the complexity of 10-K information. If firms with longer GAP have more complicated information, then the correlation between GAP and investor under-reaction may be caused by investor under-reaction to late 10-K filings which contain more complicated

information. However, it is not clear how GAP correlates with the complexity of 10-K. On the one hand, firms with more complicated operations may take more time to finish 10-K. This leads to a positive correlation between GAP and 10-K complexity. On the other hand, if most firms file 10-K at the latest permissible time, then long GAP may simply indicate that the firm has relatively simple business which enables them to release earnings sooner. This suggests a negative correlation between GAP and information complexity. We add the complexity measure of You and Zhang (2007) to regression (5). Untabulated results indicate that, after controlling for size, GAP and COMPLEX exhibit negative correlation. Nonetheless, to control for the impact of 10-K complexity we augment model (7) by further controlling for information complexity:

$$\begin{aligned}
 & BHAR_{12M} \\
 & = \beta_0 + \beta_1 GAP + \beta_2 EAR + \beta_3 FDR + \beta_4 GAP * EAR + \beta_5 GAP * FDR \quad (8) \\
 & \quad + \beta_6 COMPLEX + \beta_7 COMPLEX * EAR + \beta_8 COMPLEX * FDR + \varepsilon
 \end{aligned}$$

The results appear in the last column of Table 7. After controlling for the effect of information complexity (COMPLEX), we find the effect of GAP on the degree of investor under-reaction to 10-K information remains significant. The coefficient on GAP\*FDR is 0.015, same as in model (7), and the t-stat increases from 2.38 in model (7) to 2.42.

## 5. An explanation for the time-gap effect

Based on the above evidence, we propose the following explanation for the phenomenon. When investors react to information they assess the importance, or usefulness, of such information. Cognitive psychology research shows that since people are constantly dividing their limited attention among alternative sources of news, they

tend to pay more attention to salient information and less to abstract or uncertain information. (Greffin and Tversky 1992).

News is often widely disseminated by the media when earnings are released at the announcement date, and key information is prominently summarized in headlines. However, 10-Ks filings do not get as much attention. Moreover, information in 10-K filings is harder to interpret. The cognitive effort needed to process earnings announcements is therefore substantially lower than the effort needed to process the information in 10-K. Word-of-mouth communication of earnings announcement information also tends to be much easier and faster. These factors may account for investor under-reaction to 10-K information.

Late filing of 10-K also makes it more likely for investors to under-react to such information, for two reasons. First, as the time lag between earnings release and 10-K filing lengthens, the attention the firm gets from media coverage of its earnings release diminishes as investors shift their attention to other stocks. Second, investors become increasingly unsure whether the information released in 10-K is new or has already been incorporated into price during the time lag through information leakage, private information collection, or disclosure of related information items. Put differently, if 10-K is filed two months after earnings release, investors are unsure of the extent to which such information has already been incorporated into price during the past two months. This renders the relevance of the 10-K information more uncertain. Together these two factors make 10-K information less salient and more uncertain, causing investors to under-react to it. This tendency holds for both investors who distill information from 10-K, as well

as for those investors who try to infer the information based on observable price movement after 10-K filing.

### 5.1. Time gap and reaction to 10-K

To further test the above hypothesis, we conduct several multivariate regression analyses to see if investors, in fact, tend to react less to 10-K information when the time gap is large. We use the absolute stock return around 10-K filing dates to measure investor reaction and estimate the following model:

$$ABS(FDR) = \alpha_0 + \alpha_1 GAP/1000 + \varepsilon \quad (9)$$

where ABS(FDR) is the absolute value of FDR. We divide GAP by 1,000 to better present the regression results. The findings of cognitive psychology research suggest that the coefficient  $\alpha_1$  be negative.

The result is reported in column one of Table 8. The coefficient on GAP/1000, -0.130, is significant at less than 1 percent level (T-stat= -3.81), which is consistent with investors reacting less to the 10-K information for firms with longer time gaps between earnings announcements and 10-K filings. We further control for various determinants of the strength of stock price reaction to new information, including SIZE, BM and BETA. In addition, since firms with more volatile prices may have larger price changes during 10-K filing days, we include an additional control variable, SIGMA, to capture the normal level of stock return volatility. SIGMA is calculated as the square root of the mean squared error of the market model regression of a firm's daily returns on market returns over the 30 days before the fiscal year end. We estimate the following model:

$$ABS(FDR) = \alpha_0 + \alpha_1 GAP/1000 + \alpha_2 SIZE + \alpha_3 BM + \alpha_4 SIGMA + \alpha_5 BETA + \varepsilon \quad (9)$$

The results in the second column of Table 8 suggest that the time gap between earnings announcements and 10-K filings have significant impact on the degree of immediate market reaction to 10-K filings, even after controlling for various other determinants.

More complex 10-K filings may contain more information and therefore induce larger market reaction. We further test the following model:

$$ABS(FDR) = \alpha_0 + \alpha_1 GAP/1000 + \alpha_2 SIZE + \alpha_3 BM + \alpha_4 SIGMA + \alpha_5 BETA + \alpha_6 COMPLEX + \varepsilon \quad (10)$$

where COMPLEX is the complexity measure used in You and Zhang (2007). The results are reported in the last column of Table 8. Indeed, immediate market reaction to 10-K filings appears to be stronger for firms with more complex 10-K reports. Even in the presence of COMPLEX, the coefficient on GAP/1000 remains negative and statistically insignificant at less than 1% level.

## 5.2 Time-series analysis of investor under-reaction

Starting in 2004 firms with market cap of 75 million or more are classified as accelerated filers and are required to file 10-K within 75 days after fiscal year end (compared to 90 days before).<sup>6</sup> We split the firms into pre-2004 and post-2004 and compare the magnitude of price drift and market reaction to 10-K. The results are reported in Table 9. Panel A examines the percentage of drift to 10-K information using the same technique as in Table 4. The size of the stock price reduces from 11.89% pre-2004 to 6.86% post-2004. The percentage of delayed market reaction also fell from

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<sup>6</sup> There are some exceptions to this classification rule. See SEC final rules 33-8128, 33-8128a, and 33-8644 for details.

42.14% to 38.99% after the new regulation. Such a reduction in the percentage of delayed reaction, on the other hand, also suggests that a change from 90 to 75 days may not be enough to cause significant change in investor attention (or lack of attention) to 10-K report. Panel B further tests the effect of the new regulation on the degree of under-reaction using a regression approach. Although the sign on FDR\*Y0405 is negative, the coefficient is insignificant. Since we have only two years of data with shorter filing time, future study is needed to fully assess the impact of this SEC rule.

## **6. Conclusion**

This paper examines how the format and timing of information release affect investor under-reaction to financial information. We find that investors tend to under-react more to information in 10-K compared to information in earnings announcement. In addition, investor under-reaction appears to be stronger for firms with a longer time gap between earnings announcements and 10-K filings. Further analysis reveals that investor under-reaction to the information contained in 10-K appears to be the main reason contributing to the overall under-reaction to financial information. Longer gaps between earnings announcements and 10-K filings seem to reduce investor attention and/or increase investor uncertainty about the informativeness of 10-K, causing investors to react less to such information. We would like to emphasize that although the evidence presented in this paper supports the findings in cognitive psychology literature, it may



also be consistent with potential Bayesian explanations (Brav and Heaton 2002). Such alternative explanations remain to be explored.<sup>7</sup>

Our study provides some preliminary evidence supporting the acceleration of filing deadlines. In addition, the evidence on the greater under-reaction to 10-K information also suggests that further action by accounting professionals to summarize information more effectively into easy-to-understand measures, such as earnings, can be welfare enhancing.<sup>8</sup>

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<sup>7</sup> Even though we use the word “under-reaction” to better relate our study to the literature, it is not our intention to draw any definitive conclusion regarding investor irrationality. Paying more attention to more salient signals could very well be a rational adaptive behavior of human being. The purpose of this study is to document how investors’ delayed reaction varies with the nature and timing of information releases.

<sup>8</sup> The assumption is that, *ceteris paribus*, more timely incorporation of information into stock prices improves welfare.

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### Table 1: Sample Selection

Our sample is based on all the annual reports from SEC EDGAR ftp server from January 1st, 1995 to December 31st, 2005. All amendment filings and transition reports are excluded. We use a dataset provided by Xignite Inc. and another dataset from Compustat to merge our 10-K samples to Compustat and CRSP. FDR is the size-adjusted returns for the three days starting from 10-K filing dates. We retain only common stocks that are traded on the NYSE/AMEX and NASDAQ.

Sample selection procedures	Subtotal
10-K	72,165
10-K 405	21,233
10KSB	26,637
10KSB40	3,414
Total number of annual filings	123,449
Observations without GVKEY or PERMNO	(49,183)
Firm-years without data from CRSP to calculate FDR	(8,602)
Securities other than US common stocks	(4,646)
10-K reports filed over 120 days after fiscal year end	(1,146)
Firm-year that cannot be matched with an earnings announcement date	(8,422)
Missing industry code	(14)
Firm-years where earnings announcement dates are before fiscal year end or after filing dates	(1,370)
Firm-years with market cap less than \$200m or stock price less than \$1	(25,147)
Number of observations in year 1995	(1,181)
<b>Final sample</b>	<b>23,738</b>

**Table 2: Descriptive statistics**

Panel A presents the distribution of key variables used in our tests. Panel B provides the correlation matrix. EAR measures the size-adjusted stock returns for the three days around the earnings announcements. FDR measures the size-adjusted returns for the three days starting from the 10-K filing dates. EAFDR is the sum of EAR and FDR if there is at least a one day gap between the earnings announcement and 10-K filing dates, otherwise EAFDR simply equals EAR. SIZE is the logarithm of the market value of equity at the end of the filing window. BM is the book-to-market ratio as of the current fiscal year end. GAP is the number of (calendar) days between earnings announcement date and the corresponding 10-K filing date. BHAR\_12M is the size-adjusted abnormal returns for the twelve months starting from the month after the filing dates. \*, \*\*, and \*\*\* indicate two-tailed statistical significance at 10, 5, and 1 percent levels.

Panel A: Distribution of variables

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>STDEV</i>	<i>Q1</i>	<i>Median</i>	<i>Q3</i>
EAR	23,738	0.006	0.076	-0.030	0.003	0.039
FDR	23,738	0.000	0.054	-0.023	0.000	0.023
EAFDR	23,738	0.006	0.094	-0.038	0.005	0.050
SIZE	23,738	7.026	1.347	5.956	6.711	7.775
BM	23,612	0.439	0.306	0.229	0.395	0.588
GAP	23,738	42.082	17.888	31	44	56
BHAR_12M	23,738	0.011	0.602	-0.297	-0.038	0.218

Panel B: Correlation matrix with Pearson correlation on the upper diagonal and Spearman correlation on the lower diagonal

	<i>EAR</i>	<i>FDR</i>	<i>EAFDR</i>	<i>SIZE</i>	<i>BM</i>	<i>GAP</i>	<i>BHAR_12M</i>
EAR		0.050***	0.820***	0.028***	0.004	0.004	0.017**
FDR	0.052***		0.579***	0.013**	0.058***	-0.020***	0.065***
EAFDR	0.796***	0.544***		0.028***	0.034***	-0.008	0.047***
SIZE	0.036***	0.020***	0.034***		-0.195***	0.150***	0.001
BM	0.008	0.062***	0.038***	-0.189***		-0.022***	0.062***
GAP	-0.003	-0.007	-0.002	0.145***	-0.016**		0.025***
BHAR_12M	0.016**	0.077***	0.056***	0.046***	0.120***	0.019***	

**Table 3: Investor under-reaction to financial information**

This table represents the predicting power of EAFDR regarding future stock returns after controlling for common risk factors and other documented anomalies. EAFDR is the sum of EAR and FDR if there is at least a one day gap between the earnings announcement and 10-K filing dates, otherwise EAFDR simply equals EAR. SUE is the fourth quarter standardized unexpected earnings of the year. ACC is the operating accrual calculated as the difference between earnings from continuing operations and the cash flow from continuing operations scaled by average total assets. BETA is estimated from a market model regression for firms with at least 18 months of returns in the three years before the filing month. SIZE is the logarithm of the market value of equity at the end of the filing window. BM is the book-to-market ratio as of the current fiscal year end. MOM is six-month stock return ending in the filing month. BHAR\_12M is the size-adjusted abnormal returns for the twelve months starting from the month after the filing dates. Year dummies are included in the regressions. The t-statistics are based on the White standard errors clustered by year and industry (Peterson 2007). \*, \*\*, and \*\*\* indicate two-tailed statistical significance at 10, 5, and 1 percent levels.

	<i>Dependent Variable: BHAR_12M</i>					
	<i>Model I</i>		<i>Model II</i>		<i>Model III</i>	
	<i>Coeff.</i>	<i>T-stat</i>	<i>Coeff.</i>	<i>T-stat</i>	<i>Coeff.</i>	<i>T-stat</i>
Intercept	0.012	0.47	-0.017	-0.41	-0.063	-1.55
EAFDR	0.299***	4.17	0.219***	3.37	0.161**	2.37
BETA			-0.016	-1.12	-0.015	-1.07
SIZE			0.002	0.47	0.002	0.55
BM			0.094***	3.45	0.126***	4.31
MOM			-0.024	-0.70	-0.032	-0.82
SUE					0.003*	1.66
ACC					-0.306***	-2.81
N	23,738		21,786		16,402	
R-square	0.48%		1.36%		1.92%	



**Table 4: Comparing the Magnitude of Under-reaction to Earnings Announcement and 10-K**

This table compares the relative degree of under-reaction to earnings announcement and 10-K filings. EAR (FDR) is calculated as the size-adjusted returns for the three days surrounding the earnings announcement date (10-K filing date). We sort firms into EAR (FDR) quintiles by comparing the current year EAR (FDR) with the quintile breakpoints of the prior year's EAR (FDR) distribution. We then track the stock return performance for each quintiles over the 12-month period starting from the month after the three-day 10-K filing window. Percentage of delayed response is calculated for the top and bottom deciles as well as the hedge portfolio buying firms with the largest EAR (FDR) and selling firms with the smallest EAR (FDR). PCT\_DRIFT is calculated as BHAR\_12m as a fraction of the sum of EAR (FDR) and BHAR\_12M for the corresponding portfolios. Pseudo-EAR and Pseudo-FDR are measured 10 days before the corresponding information release date.

**Panel A: Investor under-reaction to 10-K filings**

FDR ranks	n	FDR	BHAR_3m	BHAR_6m	BHAR_12m
1	3,730	-8.25%	-0.27%	-2.55%	-4.80%
2	5,021	-2.34%	0.64%	0.16%	-0.42%
3	5,466	-0.11%	1.07%	1.54%	1.42%
4	5,381	2.01%	1.08%	1.41%	2.23%
5	4,140	7.78%	1.37%	2.38%	6.12%
Q5-Q1		16.03%	1.63%	4.93%	10.92%
PCT drift		40.52%			

**Panel B: Investor under-reaction to earnings announcements**

EAR ranking	N	EAR	BHAR_3m	BHAR_6m	BHAR_12m
1	4,953	-9.27%	0.81%	-1.06%	-0.56%
2	4,573	-2.26%	0.50%	0.94%	0.92%
3	4,613	0.28%	0.97%	1.28%	0.34%
4	4,722	3.10%	1.16%	1.57%	2.34%
5	4,877	11.28%	0.68%	0.98%	2.26%
Q5-Q1		20.55%	-0.13%	2.04%	2.82%
PCT drift		12.07%			

**Panel C: Test for differential market under-reaction to EAR and FDR (DEPVAR: BHAR\_12m)**

	<i>Intercept</i>	<i>FDR</i>	<i>EAR</i>	<i>R-square</i>	<i>N</i>
Coefficient	0.010	0.721***	0.124	0.44%	22,826
t-stat	(0.66)	(4.23)	(1.25)		

**Panel D: Test with Pseudo-EAR and Pseudo-FDR (DEPV:BHAR\_12m)**

	<i>Intercept</i>	<i>Pseudo FDR</i>	<i>Pseudo EAR</i>	<i>R-square</i>	<i>N</i>
Coefficient	0.011	0.173	-0.048	0.03%	22,790
t-stat	(0.67)	(1.30)	(-0.23)		

**Table 5: Determinants of GAP and Investor Under-reaction**

This table examines the effect of size and book-to-market- on GAP. GAP is the number of (calendar) days between earnings announcement dates and the corresponding filing dates. SIZE is measured as the logarithm of the market value of equity at the end of the filing window. BM is the book-to-market ratio as of the current fiscal year end. Year dummies are included in the regressions. The t-statistics are based on the White standard errors clustered by year and industry. \*, \*\*, and \*\*\* indicate two-tailed statistical significance at 10, 5, and 1 percent levels.

	<i>Dependent variable: GAP</i>					
	Model I		Model II		Model III	
	Coeff.	T-stat	Coeff.	T-stat	Coeff.	T-stat
INTERCEPT	31.699***	16.63	47.538***	33.37	31.310***	16.16
SIZE	2.185***	13.50			2.197***	13.16
BM			-1.305*	-1.82	0.650	0.84
N	23,738		23,612		23,612	
R-square	15.24%		12.60%		15.23%	

**Table 6: The performance of EAFDR strategy for firms with short, median and long gap between earnings announcement and filing dates**

This table documents the correlation between GAP and investor under-reaction. The performance of a strategy buying stocks with highest EAFDR and shorting stocks with lowest EAFDR is compared for firms with short, median and long gap between earnings announcement and 10-K filings. GAP is the number of (calendar) days between earnings announcement dates and the corresponding filing dates. EAFDR is the sum of EAR and FDR if there is at least a one day gap between the earnings announcement and 10-K filing dates, otherwise EAFDR simply equals EAR. Each year firms are placed into three portfolios based on GAP. Firm-years with the shortest gap are assigned GAP RANK of 1. Those with the longest gap are assigned with a GAP RANK of 3. We calculate three-, six- and twelve-month size-adjusted returns for the five quintiles formed on EAFDR within each GAP group. The hedge returns are the difference of size-adjusted returns between the lowest and highest EAFDR quintiles. \*, \*\*, and \*\*\* indicate two-tailed statistical significance at 10, 5, and 1 percent levels. In Panel B, GAP RANK is determined every year within each industry.

**Panel A: GAP ranked within each year**

EAFDR RANK	GAP RANK = 1 (i.e. shortest gap group)			
	N	BHAR_3m	BHAR_6m	BHAR_12m
Lowest	1,669	-0.57%	-3.17%***	-5.48%***
2	1,540	1.48%***	1.05%	-0.27%
3	1,499	1.15%**	1.38%	-0.10%
4	1,488	1.68%***	1.64%	1.74%
Highest	1,665	0.52%	0.33%	-0.57%
Hedge return		1.09%	3.50%**	4.91%*
	GAP RANK=2 (i.e. medium gap group)			
EAFDR rank	N	BHAR_3m	BHAR_6m	BHAR_12m
Lowest	1,562	1.18%*	-1.13%	-1.29%
2	1,568	1.57%***	0.89%	0.44%
3	1,540	0.45%	0.37%	-0.48%
4	1,623	0.82%	1.02%	2.50%*
Highest	1,669	1.48%**	2.20%**	5.35%***
Hedge return		0.31%	3.34%**	6.64%***
	GAP RANK=3 (i.e. longest gap group)			
EAFDR rank	N	BHAR_3m	BHAR_6m	BHAR_12m
Lowest	1,676	-0.77%	-2.63%**	-1.65%
2	1,544	-0.06%	0.33%	-0.78%
3	1,649	0.64%	2.36%***	2.50%*
4	1,537	2.20%***	4.05%***	6.52%***
Highest	1,509	0.84%	2.66%**	8.02%***
Hedge return		1.61%	5.28%***	9.67%***

**Panel B: GAP ranked within each year-size-industry group**

EAFDR RANK	GAP RANK = 1 (i.e. shortest gap group)			
	N	BHAR_3m	BHAR_6m	BHAR_12m
Lowest	1,463	-0.04%	-2.40%**	-3.88%*
2	1,497	1.33%**	1.49%*	0.68%
3	1,452	1.86%***	2.56%***	0.89%
4	1,427	1.16%**	0.94%	0.89%
Highest	1,462	0.31%	-0.39%	-0.73%
Hedge return		0.35%	2.01%	3.15%
GAP RANK=2 (i.e. medium gap group)				
EAFDR rank	N	BHAR_3m	BHAR_6m	BHAR_12m
Lowest	1,744	0.29%	-2.25%**	-2.62%
2	1,610	1.16%**	0.65%	-0.25%
3	1,736	0.00%	0.30%	-0.78%
4	1,690	1.66%***	2.41%***	3.78%***
Highest	1,779	1.04%	1.84%*	4.39%***
Hedge return		0.74%	4.09%***	7.01%***
GAP RANK=3 (i.e. longest gap group)				
EAFDR rank	N	BHAR_3m	BHAR_6m	BHAR_12m
Lowest	1,700	-0.51%	-2.37%**	-2.16%
2	1,545	0.51%	0.16%	-0.99%
3	1,500	0.51%	1.52%	2.19%
4	1,531	1.80%***	3.20%***	5.89%***
Highest	1,602	1.45%**	3.45%***	8.32%***
Hedge return		1.95%**	5.82%***	10.49%***

**Table 7: Regression analysis of the effect of GAP on the degree of investor under-reaction**

This table presents the results from regression analysis of GAP and the degree of investor under-reaction (to 10-K filings). EAR is calculated as the size-adjusted returns for the three days around the earnings announcements. GAP is the number of (calendar) days between earnings announcement dates and the corresponding filing dates. FDR is the size-adjusted returns for the three days starting from the filing dates. EAFDR is the sum of EAR and FDR if there is at least a one day gap between the earnings announcement and 10-K filing dates, otherwise EAFDR equals EAR. SIZE is the logarithm of the market value of equity at the end of the filing window. BM is the book-to-market ratio as of the current fiscal year end. GAP is the number of (calendar) days between earnings announcement dates and the corresponding filing dates. BHAR\_12M is the size-adjusted abnormal returns for the twelve months starting from the month after the filing dates. COMPLEX is the dummy variable indicating the length of 10-K reports greater than the annual median. Pseudo-EAR and Pseudo-FAR are measured 10 days before the corresponding information release date. Pseudo-EAFDR is the sum of Pseudo-EAR and Pseudo-FDR. Year dummies are included in all regressions. The t-statistics are based on the White standard errors clustered by year and industry. \*, \*\*, and \*\*\* indicate two-tailed statistical significance at 10, 5, and 1 percent levels.

**Panel A: GAP and investor under-reaction**

	<i>Dependent Variable: BHAR_12M</i>					
	<i>Model I</i>		<i>Model II</i>		<i>Model III</i>	
	<i>Coeff.</i>	<i>T-stat</i>	<i>Coeff.</i>	<i>T-stat</i>	<i>Coeff.</i>	<i>T-stat</i>
INTERCEPT	-0.112**	-2.36	-0.115**	-2.45	-0.114**	-2.44
GAP	0.001*	1.88	0.001**	2.34	0.001**	2.34
EAFDR	0.009	0.07				
EAFDR*GAP	0.006**	2.20				
FDR			-0.232	-0.87	-0.503*	-1.83
FDR*GAP			0.020***	3.04	0.021***	3.11
EAR			0.189	1.08	0.262	1.56
EAR*GAP			-0.002	-0.39	-0.002	-0.42
COMPLEX					0.000	0.02
FDR*COMPLEX					0.513**	2.15
EAR*COMPLEX					-0.135	-0.80
SIZE	0.003	0.65	0.002	0.39	0.002	0.36
BM	0.124***	3.29	0.118***	3.20	0.118***	3.21
N	23,612		22,718		22,644	
R-square	0.99%		1.32%		1.38%	

**Panel B: Test with Pseudo-EAFDR (DEPV:BHAR\_12m)**

	<i>Intercept</i>	<i>GAP</i>	<i>Pseudo EAFDR</i>	<i>GAP*Pseudo-EAFDR</i>	<i>R-square</i>	<i>N</i>
Coefficient	-0.008	0.001*	0.269	-0.004	0.37%	23,703
t-stat	(-0.35)	(1.94)	(1.40)	(-0.79)		

**Table 8: Gap and investor reaction to 10-K (FDR)**

This table examines the correlation between the length of GAP and the strength of immediate investor reaction to 10-K filings. Dependent variable ABS(FDR) is the absolute value of FDR. GAP is the number of (calendar) days between earnings announcement dates and the corresponding filing dates. FDR is the size-adjusted returns for the three days starting from the filing dates. GAP is the number of (calendar) days between earnings announcement dates and the corresponding filing dates. SIZE is the logarithm of the market value of equity at the end of the filing window. BM is the book-to-market ratio as of the current fiscal year end. BETA is estimated from a market model regression for firms with at least 18 months of returns in the three years before the filing month. SIGMA is the square root of the mean squared error of the market model regression of firms daily returns on market returns over the 30 days before the fiscal year end. COMPLEX is the dummy variable indicating the length of 10-K reports greater than the annual median. Year dummies are included in regression. The t-statistics are based on the White standard errors clustered by year and industry. \*, \*\*, and \*\*\* indicate two-tailed statistical significance at 10, 5, and 1 percent levels.

	<i>Dependent variable: ABS(FDR)</i>					
	Model I		Model II		Model III	
	Coeff.	T-stat	Coeff.	T-stat	Coeff.	T-stat
INTERCEPT	0.033***	14.26	0.024***	8.13	0.024***	8.16
GAP/1000	-0.132***	-3.81	-0.076***	-4.18	-0.074***	-4.02
SIZE			-0.001***	-5.65	-0.001***	-6.11
BM			-0.004***	-3.83	-0.004***	-4.07
SIGMA			0.588***	15.81	0.587***	15.67
BETA			0.005***	9.25	0.005***	9.18
COMPLEX					0.001**	2.55
N	23,738		21,788		21,706	
R-square	11.90%		21.49%		21.54%	

**Table 9: Comparing investor under-reaction before and after SEC ruling on shortening filing time**

This table compares the degree of under-reaction to 10-K filings before and after 2004. FDR is calculated as the size-adjusted returns for the three days following 10-K filing date. We sort firms into FDR quintiles by comparing the current year FDR with the quintile breakpoints of the prior year's FDR distribution. We then track the stock return performance for each quintiles over the 12-month period starting from the month after the three-day 10-K window. Percentage of delayed response is calculated for the hedge portfolio buying firms with the largest FDR and selling firms with the smallest FDR. PCT\_DRIFT is calculated as BHAR\_12m as a fraction of the sum of FDR and BHAR\_12M for the corresponding portfolios. We break the sample into two sub-periods: pre- and post-2004. Y0405 is a dummy variable that equals 1 for year 2004 and 2005, 0 otherwise. SIZE is the logarithm of the market value of equity at the end of the filing window. BM is the book-to-market ratio as of the current fiscal year end. BETA is estimated from a market model regression for firms with at least 18 months of returns in the three years before the filing month. COMPLEX is the dummy variable indicating the length of 10-K reports greater than the annual median. Panel B investigate whether the degree of investor under-reaction changes in 2004 and 2005 using a regression approach. EAR is calculated as the size-adjusted returns for the three days around the earnings announcements. The t-statistics are based on the White standard errors clustered by year and industry. \*, \*\*, and \*\*\* indicate two-tailed statistical significance at 10, 5, and 1 percent levels.

**Panel A: Comparison of investor under-reaction to FDR during pre-04 and post-04 periods**

Pre-04: 1996-2003					
FDR rank	n	FDR	BHAR_3m	BHAR_6m	BHAR_12m
1	2,981	-8.44%	-0.19%	-2.73%	-5.21%
2	3,910	-2.50%	0.32%	-0.20%	-1.15%
3	4,111	-0.08%	1.17%	1.74%	1.57%
4	4,018	2.22%	0.88%	1.27%	2.07%
5	3,351	7.88%	1.25%	2.08%	6.68%
Q5-Q1		16.33%	1.44%	4.80%	11.89%
PCT drift		42.14%			
Post-04: 2004-2005					
FDR rank	n	FDR	BHAR_3m	BHAR_6m	BHAR_12m
1	749	-5.47%	-0.59%	-1.85%	-3.17%
2	1,111	-1.79%	1.74%	1.42%	2.13%
3	1,355	-0.21%	0.77%	0.91%	0.98%
4	1,363	1.41%	1.68%	1.83%	2.71%
5	790	5.27%	1.89%	3.68%	3.70%
Q5-Q1		10.74%	2.48%	5.53%	6.86%
PCT drift		38.99%			

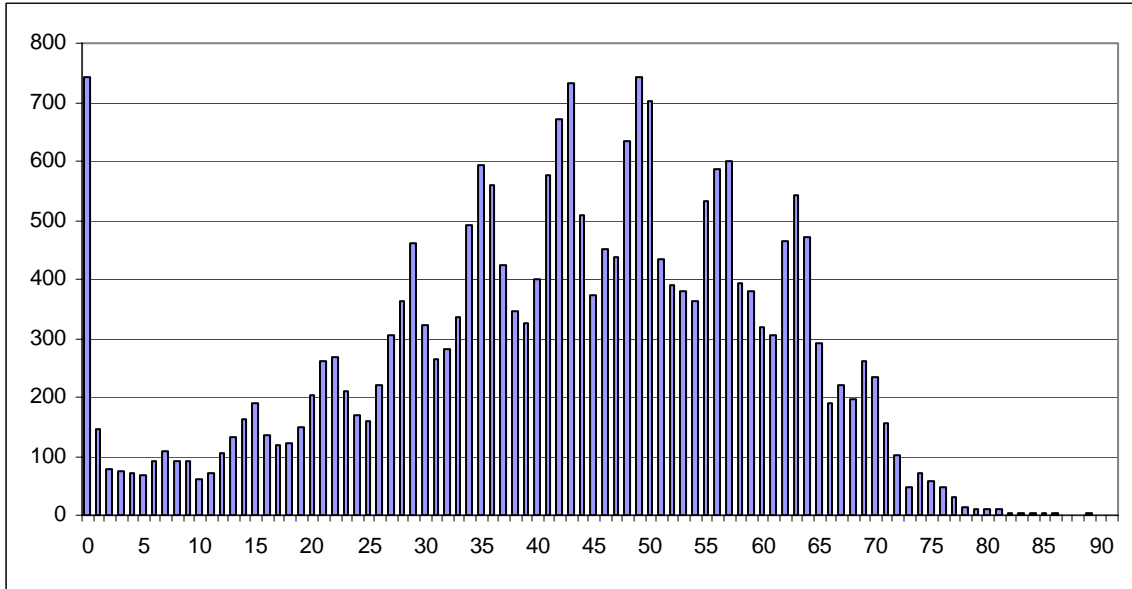


**Panel B: Regression analysis of the new SEC rule on investor under-reaction to 10-K**

<i>Parameter</i>	<i>Dependent Variable: BHAR_12M</i>			
	<i>Coeff.</i>	<i>T-stat</i>	<i>Coeff.</i>	<i>T-stat</i>
Intercept	0.009	0.48	-0.083	-1.58
Y0405	0.006	0.23	0.006	0.24
FDR	0.748***	4.33	0.714***	4.46
FDR*Y0405	-0.252	-0.98	-0.268	-1.05
SIZE			0.006	1.33
BM			0.119***	3.32
N	23,728		23,612	
R-square	0.43%		0.79%	

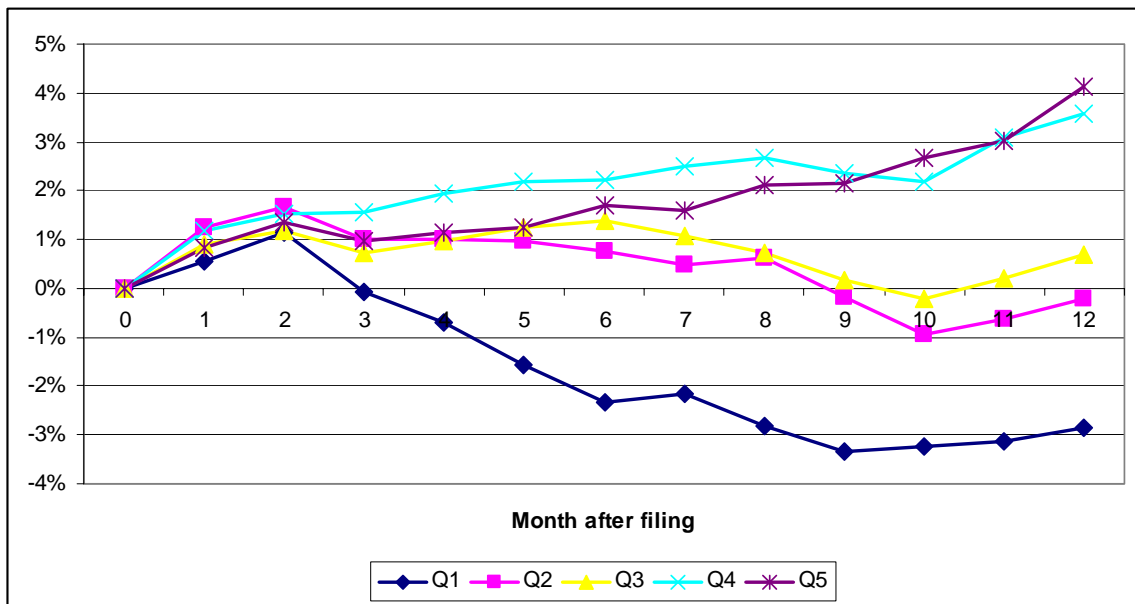
**Figure 1: Distribution of GAP**

This figure represents the distribution of GAP for our sample with 23,738 firm-year observations. GAP is the number of (calendar) days between earnings announcement dates and the corresponding filing dates.



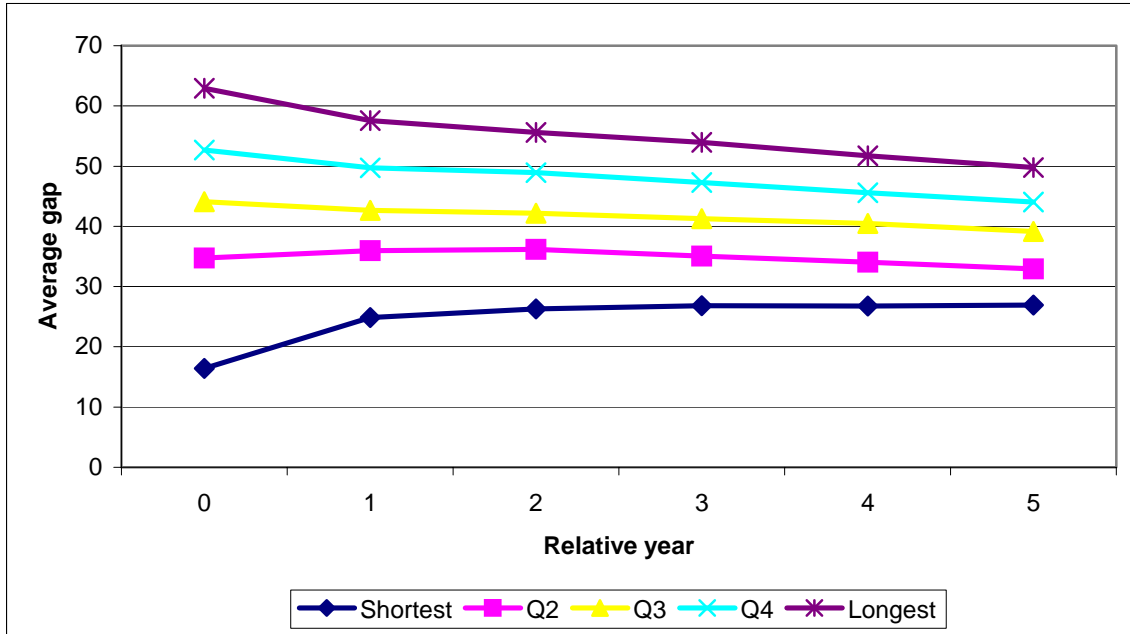
**Figure 2: Cumulative abnormal returns for twelve months after 10-K filings**

This figure shows the cumulative size-adjusted returns for the five EAFDR quintiles over the sample period of 1996-2005. Firms with the highest size-adjusted returns over the three days filing windows [0, 2] are classified into quintile 5 (denoted as Q5). Those with the lowest size-adjusted returns over the three days filing windows are placed into quintile 1 (denoted as Q1). The difference of the 12-month cumulative returns between the two groups is around 6.98%.



**Figure 3: Average GAP over the future five years for quintiles formed on current GAP**

Firms are placed into five equal-sized groups based on GAP each year. GAP is the number of (calendar) days between earnings announcement date and the corresponding filing date. This figure plots mean and median GAP value for the five groups over the current and future five years.



**Figure 4: The distribution of GAP across industries**

GAP is the number of (calendar) days between earnings announcement date and the corresponding filing date. This figure shows the industry medians of GAP. Firms are classified into various industries based on their 2-digit SIC codes.

