

# Unintended Consequences of the Sarbanes-Oxley Act: Stay Small

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**Abstract:** The SEC has on various occasions from 2003 – 2006 postponed compliance with Section 404 of the Sarbanes-Oxley Act of 2002 (SOX) for “non-accelerated filers” (firms with market values less than \$75 million). We hypothesize and find that these firms had an incentive to remain below this bright line threshold. Moreover, we document that these firms remained small by undertaking less investment, issuing fewer secondary equity offerings, making more cash payouts through dividends and share repurchases, engaging in more insider selling, and reporting lower earnings than control firms. Our evidence suggests that when regulations entail large costs for small businesses, one of the unintended consequences of scaling regulation for small companies is that these firms have incentives to stay small.

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## 1. Introduction

Considerable debate exists of the costs and benefits of the Sarbanes Oxley Act of 2002 (SOX) among executives, politicians, regulators, capital market participants, the media, and academics.<sup>1</sup> SOX aims to better protect investors. However, the legislation also entails alleged large compliance costs and a variety of other consequences. For example, commentators point out that SOX can undesirably reduce management risk-taking incentives, distort corporate disclosure, and impede the flow of information within a company. Furthermore, the Act can reduce firms' ability to attract qualified managers and directors (Ribstein, 2002; Romano, 2005; Holmstrom and Kaplan, 2007). The empirical evidence provided in Zhang (2007) indicates that SOX imposed net costs on shareholders. DeFond et al. (2007) conclude that the market expected SOX to impose net costs on bondholders. However, the debate over whether SOX was on net costly is far from settled (Leuz, 2007).

SOX has changed the cost and benefit tradeoff in many firms' decision to participate in U.S. public capital markets. Extant research documents a variety of consequences of the legislation including the tendency of firms going private (Engel et al., 2007) and dark (Leuz et al., 2007), fewer foreign firms listing on U.S. exchanges (Piotroski and Srinivasan, 2007, and Hostak et al., 2007), and fewer foreign firms raising debt capital on U.S. debt markets (Gao, 2007). The purpose of this paper is to document a heretofore unrecognized consequence of SOX among firms that do remain in U.S. public capital markets. We hypothesize that there is incentive for firms to stay small, in particular to keep their market capitalization below \$75 million, the threshold in SEC's definition of "non-accelerated" filers. The distinction between accelerated filers and non-accelerated filers was first introduced in SEC Rule 128 issued on

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<sup>1</sup> See, for example, Coates (2007), Romano (2005), and Ribstein (2002).

September 5, 2002, soon after the enactment of SOX, regarding the acceleration of 10-K and 10-Q reports. The fundamental requirement for non-accelerated filers is that they have market capitalizations below \$75 million.<sup>2</sup> Since 2003 these firms have received postponements in their compliance deadline regarding SOX Section 404 provisions on internal controls.

Section 404 requires that management document and assess the effectiveness of internal controls and that the external auditor attest to and report on management's assessment. SEC filers and other commentators view Section 404 as one of the most onerous parts of SOX (e.g. Zhang, 2007). The requirements of Section 404 are designed to apply to all public companies regardless of size. However, from the outset small businesses strongly opposed the one-size-fits-all regulatory approach. Due to the fixed component in compliance costs, small firms are disproportionately impacted relative to large firms (e.g. Eldridge and Kealey, 2005; A.R.C. Morgan, 2005); they must compete with large firms for the post-SOX limited supply of auditor expertise and faced a sharp rise of auditor costs.<sup>3</sup> Perhaps more importantly, small businesses argue that the Section 404 mandated well-defined internal control processes and clearly-segregated within firm boundaries are fundamentally incompatible with their need to remain nimble and competitive in the market place and as a result leads to erosions of shareholder value.<sup>4</sup>

In response to the concerns expressed by small businesses, the SEC extended the compliance deadline for non-accelerated filers relative to that of accelerated filers when it adopted its final rules regarding Section 404 on May 27, 2003. The extension raised expectations of more extensions and possible eventual exemption to complying with Section 404

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<sup>2</sup> Detailed definitions of accelerated and non-accelerated filers are provided in Table 1.

<sup>3</sup> See for example the *Wall Street Journal* editorial on August 15, 2005 "Sarbanes-Oxley is a curse for small-cap companies" by the Chairman and CEO of the American Stock Exchange.

<sup>4</sup> *Final report of the Advisory Committee on Small Public Companies to the United States Securities and Exchange Commission*, April 23, 2006.

for non-accelerated filers.<sup>5</sup> Zhang (2007) reports that non-accelerated filers receiving an additional year before having to comply with Section 404 experienced on average over 1% of abnormal stock returns in the five days surrounding the SEC's deferment announcement on May 27, 2003. One interpretation of Zhang's finding is that the market interpreted the deferral of Section 404 and the possible eventual exemption of non-accelerated filers from Section 404 as firm-value enhancing.

Our maintained assumption holds that managers of non-accelerated filers on average view complying with Section 404 as imposing net private costs on their shareholders. This is consistent with the evidence in Zhang (2007) that the deferment announcement triggered positive stock market reactions. Given this maintained assumption, we hypothesize that managers of non-accelerated filers undertake a series of actions to maintain their firm's "non-accelerated filer" designation by keeping their market capitalization below \$75 million. On the other hand, the \$75 million threshold is likely of little relevance for an accelerated filer even if it has a market value close to \$75 million because once classified as an accelerated filer, stringent requirements must be satisfied to exit that status.<sup>6</sup>

In our tests, we compare the non-accelerated filers with a control sample of accelerated filers. We required that all our sample firms have market capitalizations of \$150 million or below to avoid including as control firms very large companies that might be vastly different from the non-accelerated filers. Our event period spans June 1, 2003 (soon after the first SEC deferment of Section 404 compliance deadline for non-accelerated filers) to December 31, 2005. In order to isolate the effect of SOX, we also construct a control period from January 1, 1999 to

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<sup>5</sup> An extension subsequently granted to accelerated filers brought their final compliance deadline to fiscal years ending on or after 11/15/2004. The non-accelerated filer compliance deadline was extended several more times to 12/15/2007. More details are provided in Table 1.

<sup>6</sup> As detailed in Table 1, prior to December 2005, to exit the accelerated filer status a company had to be a Small Business Issuer with market values and revenues less than \$25 million for two consecutive years.

September 1, 2001, which ends before the legislative activities leading to SOX and before the SEC introduced the “accelerated” and “non-accelerated filers” distinction. In the pre-SOX control period we assign pseudo-identifiers to firms as either accelerated filers or non-accelerated filers according to the later SEC definitions. Our test design is therefore one of difference-in-differences where we compare the post-SOX differences between non-accelerated filers and accelerated filers to the corresponding pre-SOX differences.

We provide a series of test results consistent with our hypothesis that non-accelerated filers undertake actions to stay below the bright line \$75 million threshold. We find that post-SOX firms below this threshold have less market value appreciation than other firms. This evidence is consistent with non-accelerated filers trying to remain small, but it does not tell us what actions these firms take to achieve this goal. We hypothesize and document a variety of techniques that non-accelerated filers appear to have used to keep their market capitalizations below the threshold post-SOX. In particular, non-accelerated filers:

- reduce their net investment in property, plant, and equipment, intangibles, and acquisitions;
- are less likely to issue secondary stock offerings;
- pay out more cash to shareholders via ordinary and special dividends and share repurchases;
- engage in more insider selling transactions;
- report lower accounting earnings.

Furthermore, we predict and find the non-accelerated filers’ incentives to undertake the above actions are weaker when their market values are further away from the \$75 million threshold.

Our study makes several contributions to the literature. First, we document a heretofore unrecognized consequence of SOX – namely the efforts by non-accelerated filers to keep their market values of equity below \$75 million. We do this first by documenting that post-SOX non-accelerated filers had less stock price appreciation than control firms. Then we document how firms accomplished this task (lower investments, fewer secondary equity offerings, larger cash payouts to shareholders, more insider selling, and lower reported earnings). Prior studies suggest SOX can change a firm’s cost-benefit tradeoff of participating in U.S. public capital markets (e.g. Engel et al. 2007 and Leuz et al. 2007). Our results indicate that for firms that do remain public, SOX can also alter their incentives to grow. Lower growth has social welfare implications if it affects employment, wealth creation, and real investment.

Second, we provide additional evidence on the economic consequences of SOX and in particular, its Section 404 provisions on internal controls, for small public companies. A common theme that emerges from prior studies is that SOX’s effects are more pronounced for small firms (for example, Engle et al., 2007, on going private decisions; Leuz et al., 2007, on firms going dark; Piotroski and Srinivasan, 2007, on foreign firm cross-listings). Our findings add to the previous literature and are consistent with the view that SOX, especially Section 404, imposes large costs on small businesses (e.g. Ribstein, 2002; Gordon, 2003; Romano, 2005; Holmstrom and Kaplan, 2007).

Finally, our study provides evidence on the economic consequences of the SEC scaling regulation for small companies. This has implications beyond SOX. Scaling regulation dates back to the 1930’s when federal securities regulation first began. More importantly, the SEC is currently considering recommendations by the Advisory Committee on Small Public Companies on a wide range of scaling regulations regarding capital formation, corporate governance,

corporate disclosure, and financial reporting.<sup>7</sup> Our evidence suggests that when regulations entail large costs for small businesses, one of the unintended consequences of scaling regulation is that firms have incentives to remain below the bright line thresholds.

The rest of the paper is organized as follows. We first describe in Section 2 the institutional background that gives rise to the SEC's definition of "non-accelerated filer" and the several postponements of the compliance deadline for Section 404. We develop our hypotheses in Section 3. Descriptions of our methodology are in Section 4. Section 5 presents evidence on non-accelerated filers market value changes relative to the control sample. Section 6 investigates the specific actions undertaken by non-accelerated filers to accomplish their goal of staying small. Section 7 concludes the paper.

## **2. Institutional background**

### *2.1. The concept of "accelerated filers" and "non-accelerated filers"*

The federal securities regulation has had a long history of scaling regulatory requirements for small businesses. From the very beginning, both the Securities Act and the Exchange Act of the 1930's contained exemptions for small companies. In 1992, the SEC introduced the concept of "Small Business Issuers", i.e. companies with revenues and public floats below \$25 million, and started to apply abbreviated disclosure rules to them.

The enactment of SOX in 2002, characterized as the most far-reaching federal securities legislation since the 1930's Securities Acts, reignited concerns about undue regulatory burdens for small companies. When the SEC adopted final rules accelerating filing deadlines for annual and quarterly reports on September 5, 2002, it introduced the concepts of "accelerated filers" and

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<sup>7</sup> The Advisory Committee on Small Public Companies was established by the SEC in March 2005 with the objective to "assess the current regulatory system for smaller companies under the securities laws of the United States, and make recommendations for changes." (*Final report of the Advisory Committee on Small Public Companies to the United States Securities and Exchange Commission*, April 23, 2006).

“non-accelerated filers” (Release No. 33-8128). The objective of this rule is to gradually move the filing deadlines for annual reports from 90 days to 60 days of the fiscal year end and the quarterly report filing deadlines from 45 to 35 days of the fiscal quarter end. The SEC exempted non-accelerated filers from the acceleration of the annual and quarterly reporting deadlines.

Table 1 chronicles the major events and provides the SEC definitions of accelerated and non-accelerated filers. “Accelerated filers” are reporting companies with public float of at least \$75 million measured as of the last business day of their most recently completed second fiscal quarter.<sup>8</sup> Once a firm becomes an “accelerated filer,” it remains so classified until it qualifies as a “Small Business Issuer.” These “non-accelerated filer” definitions remained in effect during our event period through the end of 2005.

**[Insert Table 1 here]**

## *2.2. Deferment of Section 404 compliance deadlines*

When the Sarbanes-Oxley Act was signed into law in July 2002, Congress directed the SEC to develop rules to implement Section 404 regarding internal controls. In the original SEC proposal, all public firms were required to comply with Section 404 for fiscal years ending on or after September 15, 2003. Based on the comments it received, in its final ruling announced on May 27, 2003, the SEC distinguished between accelerated and non-accelerated filers and required that accelerated filers must comply with Section 404 beginning for fiscal years ending

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<sup>8</sup> Public float is defined by the SEC as the aggregate market value of voting and non-voting common equity held by non-affiliates of the issuer. “An affiliate is a person, such as a director or large shareholder, in a relationship of control with the issuer. Control means the power to direct the management and policies of the company in question, whether through the ownership of voting securities, by contract, or otherwise.”

([www.sec.gov/investor/pubs/rule144.htm](http://www.sec.gov/investor/pubs/rule144.htm))

We use market capitalization to proxy for public float for the following reasons: 1) the legal determination of an “affiliate” can be subjective and involves a great deal of uncertainty. 2) Using the Thompson Insider Filing data to calculate affiliated holdings leads to the loss of roughly one quarter of our total firm-year observations. 3) For observations where valid public float information can be calculated, the correlation between market capitalization and public float is 0.97 for our sample firms and the mean market capitalization and mean public float are sufficiently close, at \$55 million and \$50 million, respectively. 4) Finally, using market capitalization to proxy for public float introduces noise into our analysis and biases against finding support for our hypotheses.

on or after June 15, 2004. The corresponding deadline for non-accelerated filers was fiscal years ending on or after April 15, 2005. (Release No. 33-8238).

Section 404 compliance deadlines were extended again on February 24, 2004 for both accelerated filers (to fiscal years ending on or after November 15, 2004) and non-accelerated filers (to fiscal years ending on or after July 15, 2005). Accelerated filers began complying with Section 404 in 2004. The deadline for non-accelerated filers was further extended -- on March 2, 2005 to fiscal years ending on or after July 15, 2006, and on September 21, 2005 to fiscal years ending on or after July 15, 2007. Finally, on August 9, 2006, the SEC proposed extending non-accelerated filers' Section 404 compliance to the first annual report for a fiscal year ending on or after December 15, 2007. Furthermore, non-accelerated filers need only complete the management's portion of the internal control requirements in their first year of compliance with the requirements. Auditor's attestation of the non-accelerated client's internal control report would follow in the next fiscal year (Release Nos. 33-8731).

In the various extensions to the compliance date for Section 404 the SEC granted, the SEC justified its decisions by arguing it was to "reduce the first year cost of compliance" and "make implementation of the internal control over financial reporting requirements more effective" (Release Nos. 33-8730A and 34-54294A).

### **3. Hypothesis development**

SOX internal control provisions in Section 404 impact large and small firms in different ways. A widely cited statistic provided by the American Electronics Association suggests that while Section 404 costs the average multibillion-dollar company about 0.5% of revenue, the figure can approach 3% for small companies thus creating significant financial strain for them. The rush to implement Section 404 also led to a shortage in the supply of audit expertise. Small

firms are disadvantaged when competing with large firms for high quality external auditors and they have to bear a disproportionately large burden from the sharp rise in audit fees. Eldridge and Kealey (2005) document that audit fees as a percentage of total assets have more than doubled since the enactment of SOX and with a particularly sharp rise for small companies.

The indirect costs of Section 404 for small companies, while harder to quantify, are probably just as significant as the direct compliance costs. Small firms' competitive advantage lies in their ability to quickly adjust to changing market conditions. This often entails frequent changes in internal processes and personnel assignments. Section 404 mandated well-defined internal control processes and clear segregation of duties is therefore less compatible with the dynamic nature of small businesses and likely hinders their ability to compete. The Advisory Committee on Small Public Companies, created by the SEC to evaluate its regulatory impact on small businesses, argues in its final report to the SEC that the result of Section 404 is "a cost/benefit equation that, many believe, diminishes shareholder value..."

Mindful of these concerns, the SEC on multiple occasions extended Section 404 compliance deadlines for non-accelerated filers (see Section 2). In the five-day window around the SEC's initial extension announcement on May 27, 2003, non-accelerated filers experienced an average abnormal stock price reaction of over 1% (Zhang, 2007). One interpretation of this evidence is that stockholders view complying with Section 404 as on net costly and the deferment as firm-value enhancing for small companies.

Our maintained assumption is that being classified as a non-accelerated filer, which resulted in deferment in Section 404 compliance, was perceived as firm-value increasing.<sup>9</sup> We

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<sup>9</sup> Non-accelerated filers also avoid the potential costs associated with the acceleration of 10-K and 10-Q filing deadlines. The SEC recognizes that while investors in smaller companies value timely disclosures, these companies "may not have the resources or infrastructure to prepare their reports on a shorter timeframe without undue burden or expense." (SEC Release No. 33-8089).

hypothesize that managers viewed this deferment as valuable because it lowered the present value of their Section 404 compliance costs. Early Section 404 compliers incurred high start up costs as the mechanics of Section 404 were being devised and a temporary shortage of Section 404 knowledgeable auditors drove audit fees higher. Both of these factors would be less binding in the future. In addition to these potential cost savings from compliance deferment, some non-accelerated filers might have held the expectation that they would eventually be exempted from the Section 404 requirements or a less onerous set of rules might be devised for small filers. Finally, future non-SOX securities legislation or securities regulation might exempt non-accelerated filers, and hence generate additional benefits of remaining below the \$75 million threshold. Having defined a category of small firms via the “accelerated”/“non-accelerated” dichotomy, there was at least the possibility that future securities rules might again exempt or defer onerous provisions. This is precisely one of the key recommendations made by the Advisory Committee on Small Public Companies in 2006. Presumably, each non-accelerated filer estimated its firm-specific benefits of remaining small, or the net costs it would then incur if it became an accelerated filer. We term these avoided net costs as the “benefits of staying small.”

Firm value maximizing managers are willing to incur costs to stay small as long as the benefits of staying small exceed the costs.<sup>10</sup> Therefore, we expect managers of firms classified as non-accelerated filers to incur costs to keep their market capitalizations below \$75 million if

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<sup>10</sup> The actions to remain small and avoid Section 404 compliance can also be due to agency problems, where the managers of non-accelerated filers seek to protect their private control benefits that an effective internal control system might jeopardize. We do not test this potential alternative explanation. Our maintained assumption is that non-accelerated filers’ efforts to avoid complying with Section 404 are due to the high net costs of Section 404 for small firms and such efforts are consistent with firm value maximization. This assumption is consistent with the widespread concerns of Section 404 costs for small businesses and with the evidence in Zhang (2007) that SEC deferment of Section 404 compliance triggered positive stock price reactions. We also note that non-accelerated filers are not exempted from other SOX provisions that toughen rules on management accountability, corporate governance, and corporate disclosure.

those costs are lower than the expected discounted net costs from Section 404 compliance and from other future potential regulatory costs associated with being classified as an accelerated filer. Non-accelerated filers might bear a variety of costs to remain small. One such cost non-accelerator filers might chose to bear is forgoing certain positive NPV projects. We use the following example to illustrate the idea.

Assume an all equity firm has a market capitalization of  $V_0$ . Currently  $V_0 < \$75$  million and hence this firm meets the SEC's definition of a non-accelerated filer. (All dollar amounts hereafter in this example are in millions.) If the firm becomes classified as an accelerated filer (i.e.,  $V_1 > \$75$ ) it will incur a cost of  $\$C$ , where  $C$  was previously defined as the benefits of staying small. In general, firms with market capitalizations below  $\$75$  avoid a stream of future net cash outflows whose present value is  $C$ . Suppose the non-accelerated filer has a new investment opportunity that has a net present value  $N > 0$ . The firm will reject this positive net present value project if

$$V_0 + N > \$75, \text{ and}$$

$$V_0 + N - C < V_0,$$

In other words, if the new project increases firm value beyond  $\$75$  and the new firm value net of the Section 404 costs is less than firm value without the project (or  $N < C$ ), the new project will be rejected. So in this simple example, firms with market capitalizations just below the  $\$75$  million threshold will forego small positive NPV projects.

Non-accelerated filers can also resort to a variety of other mechanisms to remain small. They might pay out more cash to shareholders via cash dividends or share repurchases than they would optimally have chosen or make less than the optimum amount of secondary equity offerings. Because the testing date for determining the accelerated versus non-accelerated filer

status is the last business day of the second fiscal quarter, non-accelerated filers might also engage in activities to exert downward pressure on its stock price prior to the test. One way to achieve this might be through more insider selling. Because small stocks generally have lower liquidity, stock sales by insiders before the test could be an effective way to temporarily depress share prices. Disclosure might be another channel through which a non-accelerated filer could influence its share price prior to the test. Given the important valuation role of accounting earnings, a manager might choose more income decreasing accounting methods to reduce earnings in order to decrease the share price. And if the various actions taken by non-accelerated filers are effective, they should manifest in the observed outcome of non-accelerated filers having lower market value appreciation than one would otherwise expect.

To form a reference point for analyzing the non-accelerated filers, we construct a control sample of accelerated filers with market capitalizations of \$150 million or below. These control firms have market values that are reasonably close to the \$75 million threshold, however, this threshold is of little relevance to them because once classified as accelerated a firm remains so classified until they satisfy the stringent requirements of a “Small Business Issuer” with revenues and market values less than \$25 million for two consecutive years. To further increase our confidence that the difference between accelerated and non-accelerated filers during our post-SOX event period are not driven by correlated omitted variables, we construct a pre-SOX control period and form pseudo classifications of accelerated and non-accelerated filers according to the later SEC definitions. Our research design is therefore one of difference-in-differences.

We state our hypotheses below, first on market value appreciation (H1), and then on the specific actions undertaken by non-accelerated filers to stay small (H2 and H3).

***Hypothesis 1:*** *Relative to the pre-SOX difference between accelerated and non-accelerated filers, in the post-SOX period non-accelerated filers have smaller stock price appreciation and are more likely to remain below the \$75 million threshold than accelerated filers.*

***Hypothesis 2:*** *Relative to the pre-SOX difference between accelerated and non-accelerated filers, in the post-SOX period non-accelerated filers are more likely to undertake the following actions to stay small than accelerated filers.*

*Hypothesis 2a: reducing their net investment in property, plant, and equipment, intangibles, and acquisitions.*

*Hypothesis 2b: making fewer secondary stock offerings.*

*Hypothesis 2c: paying out more cash to shareholders via ordinary and special dividends and share repurchases.*

*Hypothesis 2d: engaging in more insider selling transactions in the second fiscal quarter.*

*Hypothesis 2e: reporting lower accounting earnings in the second fiscal quarter.*

Note that there is a timing dimension to the hypothesized actions in H2d (insider selling) and H2e (reporting lower earnings). We hypothesize that these actions are more likely to occur in the second fiscal quarter prior to the testing date of the filing status because these actions are more geared toward exerting temporary downward pressure on share prices. In contrast, the actions in H2a-H2c (lower investments, less equity issuance, and more cash payouts) likely have long lasting effects on market value and we therefore hypothesize that they are more likely to be taken throughout the year by non-accelerated filers post-SOX.

Among non-accelerated filers, the \$75 million threshold is also of different significance depending on how likely they are to cross the threshold and become an accelerated filer. The closer a firm's market value is to \$75 million, the more likely it is concerned about crossing the benchmark, and as a result the more likely it is to engage in the various actions predicted in Hypothesis 2. We therefore make the following prediction.

*Hypothesis 3: In the post-SOX period, non-accelerated filers' propensity to undertake the actions predicted in Hypothesis 2 decreases when their market values are further away from \$75 million.*

#### **4. Methodology**

As discussed earlier, our sample comprises two time periods. The event period spans June 1, 2003 (soon after the SEC final ruling concerning Section 404 on May 27) to December 31, 2005. A control period is selected as January 1, 1999 to September 1, 2001, which ends before the legislative activities leading to SOX and before SEC's introduction of the accelerated and non-accelerated filers concept. We start with firms that have a second fiscal quarter end that falls within either one of the two time periods and with a market value of equity of \$150 million or below at this particular fiscal quarter end. A related timeline of the test and control period windows is displayed in Figure 1.

Most of our tests are conducted with a firm-year as the unit of observation. Firm-year  $t$  is defined as the one-year period from the end of the second fiscal quarter end in fiscal year  $t$  (time 1 in Figure 2) to the next second fiscal quarter end (time 2). We measure our main test variables -- non-accelerated filer status and the distance of a firm's market value from \$75 million, at time 1. The dependent variable in our market value appreciation test -- one-year-ahead market value, is measured at time 2. The other dependent variables on the specific actions undertaken by non-accelerated filers are measured over firm-year  $t$ .

**[Insert Figures 1 and 2 here]**

Our main data source is COMPUSTAT. Data on stock returns and dividend announcement dates are from CRSP. Information on seasoned equity offerings is from SDC and insider trading information is obtained from Thomson Financial Insider Filing Data. As reported in Table 2 Panel A, we exclude foreign firms, financial institutions and firms in regulated

industries, as well as firms with market value of common equity above \$150 million at the end of the second fiscal quarter in year  $t$  (time 1 in Figure 2). For partial year observations (firm-years ending outside the two time period windows), we require a minimum of three months of data within the window for inclusion in our sample. We also require information on lagged ROA, market-to-book ratio, sales, and free cash flows for subsequent regression estimations. These data requirements lead to a base sample of 8,143 firm-year observations with 4,833 firm-years (2,831 firms) in the control period and 3,310 firm-years (1,774 unique firms) in the event period. The reduction in observations from the control to event period likely reflects the overall decrease in the number of public firms due to the market downturn in the interceding years as well as firms exiting the public capital markets post-SOX through going private (Engel et al. 2007) or going dark (Leuz et al. 2007). Because the various tests impose different sample restrictions, we defer specific discussions of the sample selection procedure for each test (reported in Table 2 Panel B) to the specific section dedicated to that test.

Table 3 reports the summary statistics of our main variables for accelerated filers and non-accelerated filers, separately (detailed variable definitions are provided in the Appendix). As expected, accelerated filers (median sales of \$86.01 million and median market value of equity of \$73.58 million) are larger than non-accelerated filers (median sales of \$29.32 million and median market value of equity of \$25.04 million). We note that the median market value of equity for *accelerated filers* is *below* \$75 million. The accelerated filers category includes firms with market capitalizations below \$75 million in the current period if these firms became accelerated filers in an earlier period (when they had market capitalizations of \$75 million or above and have not exited the accelerated filer status through becoming a Small Business Issuer (see Section 2.1). We also note that the non-accelerated filers are larger than firms going dark,

which have median market value of roughly \$4 million as reported in Leuz et al. (2007). Therefore, the non-accelerated filers are more likely to benefit from remaining in the public markets relative to firms that voluntarily deregister with the SEC. Accelerated filers have larger market-to-book ratios (mean 1.62) than non-accelerated filers (mean 1.27). Table 4 presents the correlation matrix for our main test variables.

**[Insert Tables 2, 3 and 4 here]**

## **5. Market value appreciation test**

In this section, we test H1 that post-SOX non-accelerated filers experience less market value appreciation relative to control firms. If the various actions undertaken by non-accelerated filers are effective, less market value appreciation should be the observed outcome and non-accelerated filers should be more likely to stay below the \$75 million threshold post-SOX. We use a logit model to study the likelihood that a firm stays below \$75 million (model (1)). We also directly model a firm's market value with an ordinary least square regression (model (1')).

The number of firm-year observations for this part of the analysis is reduced from 8,143 in the base sample to 3,774 due to missing one-year-ahead market values for partial year observations (Table 2 Panel B). We estimate the following logistic regression model (for ease of exposition, we suppress firm subscripts in this and all subsequent regression models):

$$prob(Less75_{t+1} = 1) = \text{Logit}(\beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 Mktret_t + \beta_5 Mve_t) \quad (1)$$

The dependent variable,  $Less75_{t+1}$ , is an indicator that equals one if the one-year-ahead market value of equity measured at time 2 (in Figure 2) is less than \$75 million, and zero otherwise.

Reflecting our difference-in-differences test design, our main test variables on the right-hand-side include an indicator variable for non-accelerated filers measured at time 1,  $NA_t$ , an indicator variable for the event period,  $Event_t$ , and their interactive term,  $Event_t NA_t$ .  $NA_t$  equals

one if the market value of equity is less than \$75 million at time 1 in year  $t$  and at all the previous second fiscal quarter ends, since SEC's introduction of the accelerated and non-accelerated filers concept in September 2002 for event period observations and since fiscal year 1998 for control period observations, and zero otherwise.<sup>11</sup>  $Event_t$  takes the value of one if year  $t$  is in the post-SOX June 1, 2003 – December 31, 2005 event period and zero if year  $t$  is in the pre-SOX January 1, 1999 to September 1, 2001 control period. The coefficient on  $NA_t$  ( $\beta_1$ ) measures the difference in the probability of remaining below \$75 million in market value between non-accelerated filers and accelerated filers during the control period. The sum of the coefficients on  $NA_t$  and  $Event_t NA_t$  ( $\beta_1 + \beta_3$ ) measures the corresponding probability difference during the event period. Therefore, the  $\beta_3$  coefficient on the interactive term captures the difference in the probability differences between the two time periods. H1 predicts that relative to the pre-SOX difference in market value appreciation between accelerated and non-accelerated filers, in the post-SOX period non-accelerated filers experience smaller price appreciations and are *more likely* to remain below \$75 million compared to accelerated filers. We therefore predict a *positive* coefficient on  $Event_t NA_t$ .

Market values of individual firms are affected by broad market movements. We include the market return based on the equally-weighted market index of CRSP firms ( $Emkret_t$ ) over the firm year as a control variable. Using market returns based on the value-weighted market index leads to the same inferences. Since firms' future market values are related to their market values in the past, we also include the market value of equity for each firm at time 1 ( $Mve_t$ ) as an additional control variable. We expect that higher market-wide returns and higher prior firm

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<sup>11</sup> We take into account the market value of equity at all prior filing status testing dates because once a firm is classified as an accelerated filer, it remains so classified even if the current year's market value falls below \$75 million, as long as it does not qualify as a Small Business Issuer.

market values lead to higher future firm market values and a lower probability of staying below \$75 million. The coefficients on market return ( $\beta_4$ ) and on prior firm market value ( $\beta_5$ ) are expected to be negative.

The regression results of model (1) are reported in Table 5, column (1). The coefficient on  $NA_t$  is insignificantly different from zero, suggesting that in the control period there is no difference in the probability of remaining below \$75 million between the accelerated and non-accelerated filers (from pseudo-classifications based on later SEC definitions). The coefficient on the interactive term,  $Event_tNA_t$ , is positive (0.668) as predicted and significant at less than the 1% level. Norton et al. (2004) call for caution when interpreting interactive terms in logit models.<sup>12</sup> We follow their recommendation and calculate the corrected marginal effect at all observations and report the mean marginal effect and the Z-statistic.<sup>13</sup> The mean marginal effect on  $Event_tNA_t$  is 8.4% with a Z-statistic of 3.39, significant at less than the 1% level. To gauge the economic significance of the marginal effect, i.e., a difference-in-differences of 8.4% in the probability of staying below \$75 million, we note that the unconditional probability of staying below \$75 million for our sample firms is 77% (2,890/3,774) with a standard deviation of 42%. In addition, all marginal effects on  $Event_tNA_t$  have the predicted positive sign.<sup>14</sup> The evidence therefore supports H1 that relative to the pre-SOX difference in market value appreciation between accelerated and non-accelerated filers, in the post-SOX period non-accelerated filers are more likely to remain below the \$75 million threshold comparing to accelerated filers. This is

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<sup>12</sup> Due to the nonlinear nature of a logit model, both the sign and the statistical significance of the regression coefficient on an interacted term may differ from the true marginal effect from the changes in the interacted variables.

<sup>13</sup> We also include discussions of the corrected marginal effects and Z-statistics per Norton et al. (2004) on our main interactive test variables in all subsequent logit models.

<sup>14</sup> A marginal effect on  $Event_tNA_t$  can be calculated for each individual observation in the regression model (Norton et al. 2004).

consistent with our conjecture that non-accelerated filers post-SOX undertake actions that allow these firms to remain small.

**[Insert Table 5 here]**

The coefficient on  $Event_t$  is negative and significant, consistent with the overall better stock market performance in the event period (the market as a whole returned on average 28% during our event period compared to 12% over the control period based on the CRSP equally-weighted index). As expected, the coefficients on  $Emktret_t$  and  $Mve_t$  are both significantly negative, suggesting higher market returns and higher prior firm market values lead to a lower probability of a firm staying below \$75 million.

In addition to the logistic regression above, we also directly model the one-year-ahead market value with an ordinary least square regression:

$$Mve_{t+1} = \beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 Mktret_t + \beta_5 Mve_t \quad (1')$$

The dependent variable,  $Mve_{t+1}$ , is the one-year-ahead market value of equity measured at time 2 (in Figure 2).<sup>15</sup> The predicted signs on  $Event_t NA_t$ ,  $Emktret_t$  and  $Mve_t$  are opposite to those in model (1) because higher  $Mve_{t+1}$  corresponds to lower likelihood of staying below \$75 million.

The regression results of model (1') are reported in Table 5, column (2). As predicted, the coefficient on  $Event_t NA_t$  is negative (-9.079) and significant at the 1% level, indicating that when benchmarked against accelerated filers, the market values of equity of non-accelerated filers are an additional \$9 million lower in event years than in control years.

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<sup>15</sup> Model (1'), with  $Mve_t$  on the right-hand-side, can be viewed as an analysis of *dollar changes* in firm market value during year t. Another potential specification is to analyze the *percentage changes* in firm market value. Given that the accelerated filer status is tested based on a dollar threshold (\$75 million), dollar changes in market value, instead of percentage changes, is likely of direct concern to a non-accelerated filer. For example, a large percentage change in market value for a small firm may not have the same dollar implication as a small percentage change in market value for a relatively large firm.

## **6. Actions undertaken by non-accelerated filers to stay small**

Having established that post-SOX non-accelerated filers are more likely to stay below the \$75 million threshold, we now address the next question of how they achieved this result. H2 hypothesizes various actions undertaken by non-accelerated filers. This section presents the related evidence. In particular, we show that post-SOX non-accelerated filers had smaller investments (Section 6.1), fewer seasoned equity offerings (Section 6.2), and higher dividend payments and share repurchases (Section 6.3) than control firms. Sections 6.4 and 6.5 find that non-accelerated filers had more insider selling and lower reported earnings in the second fiscal quarter than control firms. Section 6.6 summarizes the main results.

In order to isolate the effect of SOX and remove the potential impact from other factors on the dependent variables, we model a dependent variable as the residual from a prediction model. For example, we use the change in investment, change in cash payouts, and change in earnings as dependent variables, assuming that the expected levels of investment, cash payouts, and earnings are the same as those from the previous period. The exception is the analysis of seasoned equity offerings where we use the level, not the change, in seasoned equity offerings as the dependent variable because these events are very infrequent. However, we do include variables that may influence firm financing decisions on the right-hand-side as controls. Finally, we use residual insider trading from the prediction model in Cheng and Lo (2006) as the dependent variable in our insider trading analysis.

### *6.1. Net investments*

In this section we test H2a that post-SOX non-accelerated filers undertake less investment to stay small. We estimate the following OLS regression model with our base sample of 8,143 firm-year observations:

$$\begin{aligned}
Chinv_{t+1} = & \beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 Dist75_t + \beta_5 Dist75_t NA_t \\
& + \beta_6 Dist75_t Event_t + \beta_7 Dist75_t Event_t NA_t + \sum_j \beta_j Controls
\end{aligned}
\tag{2}$$

The dependent variable  $Chinv_t$  measures the change in investment over firm-year  $t$  (one year period between time 1 and time 2 in Figure 2) deflated by lagged total assets. Investment is defined as the sum of annual capital expenditure (COMPUSTAT data item 128), R&D expenditure (data item 46), advertising expense (date item 45), acquisitions (data item 129), minus the sale of PP&E (data item 107).

The right-hand-side variables include  $NA_t$ ,  $Event_t$ , and their interactive term  $Event_t NA_t$ . H2a predicts that relative to the pre-SOX difference in investment between non-accelerated filers and accelerated filers, in the post-SOX period non-accelerated filers *reduce* investment comparing to accelerated filers. Therefore, the coefficient on the interactive term  $Event_t NA_t$ , which reflects the pre- and post-SOX difference in the differences in investment between non-accelerated and accelerated filers, is predicted to be *negative*.

H3 further predicts non-accelerated filers' incentives to undertake actions in order to stay small are weaker when they have a lower likelihood of crossing the \$75 million threshold and becoming an accelerated filer. We proxy for that likelihood by the distance between a firm's market value and \$75 million. The further away a non-accelerated filer's market value is from the threshold, the less concerned they are about crossing the threshold within the coming year and the less likely they will take any actions to stay small. We define  $Dist75_t$  as the absolute value of the difference between \$75 million and a firm's market value at time 1. We expect the

negative coefficient on  $Event_tNA_t$  predicted under H2a to attenuate for larger values of  $Dist75_t$ . Therefore, the coefficient on the interactive term  $Dist75_tEvent_tNA_t$  is expected to be positive.<sup>16</sup>

Model (2) and subsequently model (3) on seasoned equity offers and model (4) on cash payouts share a number of control variables. We include lagged information on *ROA*, market-to-book ratio (*MB*), *Sales*, free cash flows (*FCF*), an indicator for older firms (*Older*), and stock return standard deviation (*Stdret*) because these characteristics are likely related to firm investment, financing, and payout decisions.<sup>17</sup> In all three models, we also include the lagged dependent variable to control for its autocorrelation.

The regression results of model (2) on changes in investments are reported in Table 6 column (1). As predicted in H2a, the coefficient on  $Event_tNA_t$  is negative (-0.052) and significant at less than the 5% level. To gauge the economic significance of this coefficient, i.e., a difference-in-differences of the change in investment of -5.2% of total assets, we note that the mean change in investment for our sample firms is -0.3% of total assets with a standard deviation of 25%. The positive coefficient on  $Dist75_tEvent_tNA_t$  (0.001, with p-value of 10%) supports H3. Taken together, the evidence is consistent with our predictions that post-SOX non-accelerated filers reduce investment relative to accelerated filers in order to remain below the \$75 million threshold. Furthermore, their incentives to take such actions weaken when their market values are further away from the threshold.

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<sup>16</sup> The probability of a non-accelerated filer crossing the \$75 million threshold in the coming year is likely related to both the dollar distance of its market value from \$75 million and the expected volatility of its stock returns. Holding constant the distance from \$75 million, higher expected return volatility can lead to higher probability of crossing the threshold. We deflate  $Dist75$  by the product of a firm's market value and the standard deviation of its stock returns over the prior year. This procedure converts  $Dist75$  in dollars into how many standard deviations away \$75 million is to a particular firm. Replacing  $Dist75$  with the deflated measure leads to stronger results in some of our regression analyses, but weaker results in others. We note that our historical measure of stock return volatility is likely a noisy proxy for the expected return volatility.

<sup>17</sup> Detailed variable definitions are in the Appendix. Our definition of free cash flows follows Blouin et al. (2004). We use nine years as the cutoff for defining older firms following Grullon and Michaely (2002). In order to reduce the influence from extreme observations, we include in the regressions decile ranks for *ROA*, market-to-book ratio, sales, and free cash flows.

Regarding the control variables, we find that firms with better performance in *ROA*, more growth options measured by *MB* have larger changes in investment. Larger firms (measured by *Sales*) have smaller changes in investment as a percentage of total assets. The coefficient on lagged change in investment is negative and significant, suggesting a partially mean-reverting process in investment.

**[Insert Table 6 here]**

## 6.2. Seasoned equity offerings

H2b predicts that post-SOX non-accelerated filers make fewer secondary equity offerings in order to stay small. We test this hypothesis using the following logistic regression model with the base sample of 8,143 firm-year observations:

$$\begin{aligned} \text{prob}(SEO_t = 1) = & \text{Logit}(\beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 Dist75_t \\ & + \beta_5 Dist75_t NA_t + \beta_6 Dist75_t Event_t + \beta_7 Dist75_t Event_t NA_t + \sum_j \beta_j Controls) \end{aligned} \quad (3)$$

The dependent variable  $SEO_t$  is an indicator that is equal to one if the firm makes a seasoned equity offering in year  $t$  (the one year period between time 1 and time 2 in Figure 2). The independent variables are the same as those in model (2). H2b predicts that relative to the pre-SOX difference in the occurrence of secondary equity offerings between non-accelerated filers and accelerated filers, in the post-SOX period non-accelerated filers *are less likely to have* seasoned equity offerings comparing to accelerated filers. Therefore, we predict a *negative* coefficient on the interactive term  $Event_t NA_t$ . Furthermore, H3 predicts that non-accelerated filers' incentives to undertake actions in order to stay small weaken when their market values are further away from the \$75 million threshold. We thus expect a positive coefficient on the interactive term  $Dist75_t Event_t NA_t$ .

The estimation results of model (3) are reported in column (2) of Table 6. Consistent with our hypotheses, the coefficient on  $Event_tNA_t$  is negative (-1.580) and significant at the 5% level. The coefficient on  $Dist75_tEvent_tNA_t$  is positive (0.042) and significant at the 5% level. Similar inferences are drawn using the corrected mean marginal effect following Norton et al. (2004). The corrected mean marginal effect on  $Event_tNA_t$  is -6.5% with a Z-statistic of -1.76, significant at the 10% level. All the marginal effects on  $Event_tNA_t$  have the predicted negative sign. In gauging the economic significance of the mean marginal effect, i.e., a difference-in-differences of -6.5% in the probability of seasoned equity offerings, we note that the unconditional probability of SEOs for our sample firms is 1.9% (153/8,143) with a standard deviation of 13.6%. The corrected mean marginal effect on  $Dist75_tEvent_tNA_t$  is 0.4% with a Z-statistic of 1.56 and with all the marginal effects having the predicted positive sign.

The results on the control variables suggest that older firms and larger firms as measured by *Sales* are less likely to issue secondary equity offerings. The positive and significant coefficient on lagged SEO indicates a positive autocorrelation in firms' equity offerings.

### 6.3. Cash dividends and share repurchases

In this section we test H2c that post-SOX non-accelerated filers pay out more cash to shareholders via regular and special dividends and share repurchases. We estimate the following two logistic models with the base sample of 8,143 firm-year observations.

$$\begin{aligned}
 \text{prob}(\text{Cashpay}_t = 1) = & \text{Logit}(\beta_0 + \beta_1NA_t + \beta_2Event_t + \beta_3Event_tNA_t + \beta_4Dist75_t \\
 & + \beta_5Dist75_tNA_t + \beta_6Dist75_tEvent_t + \beta_7Dist75_tEvent_tNA_t + \sum_j \beta_jControls) \quad (4)
 \end{aligned}$$

$$\begin{aligned}
 \text{prob}(\text{Chcashpay}_t = 1) = & \text{Logit}(\beta_0 + \beta_1NA_t + \beta_2Event_t + \beta_3Event_tNA_t + \beta_4Dist75_t \\
 & + \beta_5Dist75_tNA_t + \beta_6Dist75_tEvent_t + \beta_7Dist75_tEvent_tNA_t + \sum_j \beta_jControls) \quad (4')
 \end{aligned}$$

The dependent variable in model (4)  $Cashpay_t$  is an indicator equal to one if a firm makes any type of cash payout (regular dividend, special dividend, or share repurchases) to shareholders during firm-year  $t$  (the one year period from time 1 to time 2 in Figure 2), and zero otherwise. Model (4') analyzes the *change* in cash payout to shareholders, where  $Chcashpay_t$  is equal to one if the sum of all cash payouts to shareholders in firm year  $t$  is larger than that in the previous firm-year, equal to zero if the sums are the same in the two years, and equal to minus one if the sum for firm-year  $t$  is smaller than that in the previous year. The independent variables in the two models are the same as those in models (2) and (3) previously.

H2c predicts that relative to the pre-SOX difference in cash payouts between non-accelerated filers and accelerated filers, in the post-SOX period non-accelerated filers make *more* cash payouts comparing to accelerated filers. We analyze both the occurrence of cash payouts (model 4) and frequency of cash payout increases (model 4') and expect the coefficient on  $Event_tNA_t$  to be *positive* in both models. Furthermore, H3 predicts non-accelerated filers' incentives to undertake actions in order to stay small weaken when their market values are further away from the \$75 million threshold. We thus expect a negative coefficient on the interactive term  $Dist75_tEvent_tNA_t$ .

The results for model (4) on  $Cashpay_t$  are reported in column (3) Table 6. Consistent with H2c, the coefficient on  $Event_tNA_t$  is positive (1.196) and significant at the 5% level. The coefficient on  $Dist75_tEvent_tNA_t$  is negative (-0.021) and significant at the 10% level, supporting H3. The corrected mean marginal effect on  $Event_tNA_t$  calculated following Norton et al. (2004) is 4.5% with a Z-statistic of 1.96, significant at the 5% level. All the marginal effects on  $Event_tNA_t$  have the predicted positive sign. In assessing the economic significance of the mean marginal effect, i.e., a difference-in-differences of 4.5% in the probability of cash payout, it is

worth noting that the unconditional probability of cash payout for our sample firms is 9.4% (769/8,143) with a standard deviation of 29.2%. The corrected mean marginal effect on  $Dist75_t Event_t NA_t$  is -0.09% with a Z-statistic of -1.46 and with all the marginal effects having the predicted negative sign.

Because the values for  $Chcashpay_t$  can take on three ordinal values, we use the generalized ordered logit model to estimate the probability that firms increase total cash payout (see Williams, 2006). The results in column (4) of Table 6 on  $Chcashpay_t$  produce similar inferences as those from column (3). Consistent with H2c, the coefficient on  $Event_t NA_t$  is positive (1.018) and significant at the 5% level. The coefficient on  $Dist75_t Event_t NA_t$  is negative (-0.022) as predicted and significant at the 5%, supporting H3. The corrected mean marginal effect on  $Event_t NA_t$  is 5.5% with a Z-statistic of 2.18, significant at the 5% level. All the marginal effects on  $Event_t NA_t$  have the predicted positive sign. As a reference point, the unconditional probability of increases in cash payout for our sample firms is 6.2% (508/8,143) with a standard deviation of 24%. The corrected mean marginal effect on  $Dist75_t Event_t NA_t$  is -0.10% with a Z-statistic of -1.99, significant at the 5% level and with all the marginal effects having the predicted negative sign.

The results on the control variables in columns (3) and (4) suggest that firms with better accounting performance ( $ROA$ ), more free cash flows, and that are older are more likely to make cash payouts to shareholders. On the other hand, more growth opportunities and more volatile stock returns are associated with a lower likelihood of cash payouts. The significant and positive coefficient on lagged  $Cashpay_t$  is consistent with the stickiness in dividend payouts (e.g. Lintner, 1956).

One factor that likely impacts corporate payout decisions during our event period is the Jobs and Growth Tax Relief Reconciliation Act of 2003, which reduces the maximum statutory personal tax rate on dividends from 38.1% to 15%. Prior studies find that the Act leads to larger corporate payouts since 2003 (e.g. Chetty and Saez, 2004, and Blouin et al., 2004). However, the dividend tax cut is unlikely to explain our results because we benchmark non-accelerated filers in each time period against accelerated filers and there is no *ex ante* reason to expect that they should react differently to the tax cut.

#### 6.4. Insider selling

In Sections 6.1 to 6.3, we document that post-SOX non-accelerated filers' undertook investment, financing, and payout decisions in order to stay small. In addition to the actions documented in the previous sections, which likely have long-lasting impact on firm market value, non-accelerated filers can also engage in activities that exert temporary downward pressure on its share price before the filing status testing date at the end of the second fiscal quarter. H2d hypothesizes that one way to achieve this is through more insider selling during the second fiscal quarter. We test this prediction using the following regression models with 26,429 firm-quarter observations:

$$\begin{aligned} Netpercent\_r_q = & \beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 2ndqtr_q \\ & + \beta_5 2ndqtr_q NA_t + \beta_6 2ndqtr_q Event_t + \beta_7 2ndqtr_q Event_t NA_t \end{aligned} \quad (5)$$

$$\begin{aligned} Buypercent\_r_q = & \beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 2ndqtr_q \\ & + \beta_5 2ndqtr_q NA_t + \beta_6 2ndqtr_q Event_t + \beta_7 2ndqtr_q Event_t NA_t \end{aligned} \quad (5')$$

$$\begin{aligned} Sellpercent\_r_q = & \beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 2ndqtr_q \\ & + \beta_5 2ndqtr_q NA_t + \beta_6 2ndqtr_q Event_t + \beta_7 2ndqtr_q Event_t NA_t \end{aligned} \quad (5'')$$

The dependent variables  $Netpercent\_r_t$ ,  $Buypercent\_r_t$ , and  $Sellpercent\_r_t$  are the residuals from prediction models of insider trading following Cheng and Lo (2006).  $Netpercent$ ,

*Buypercent*, and *Sellpercent* are defined as  $(\text{buy}-\text{sell})/(\text{buy}+\text{sell})$ ,  $\text{buy}/(\text{buy}+\text{sell})$  and  $\text{sell}/(\text{buy}+\text{sell})$ , respectively, where “buy” is the sum of all shares that insiders buy over a fiscal quarter and “sell” is the sum of all shares that insiders sell over a fiscal quarter. The estimated Cheng and Lo (2006) models are presented in Table 7 Panel B. The independent variables in these models include options granted, the firm’s stock and accounting returns, firm size, market-to-book ratio, and the lagged dependent variable.

Because H2d predicts that post-SOX non-accelerated filers have less insider purchase and more insider selling in the second fiscal quarter, our tests focus on the variable  $2ndqtr_qEvent_tNA_t$ . The coefficient on this variable is predicted to be *negative* in models (5) and (5’) on net and gross insider purchases and *positive* in model (5’’) on insider selling. H3 also suggests that the insider trading activities hypothesized in H2d become weaker the further the firm’s market value is from \$75 million. When we introduce  $Dist75_t$  and its related interactive terms in the above models, we do not find the interactive term  $Dist75_t 2ndqtr_qEvent_tNA_t$  to be significant in any of the specifications. For brevity, we exclude the  $Dist75_t$ -related terms from the models.

The regression estimation results are presented in Table 7 Panel A. We find that  $2ndqtr_qEvent_tNA_t$  has a negative coefficient (-0.069) and is significant at the 10% level in column (1), suggesting post-SOX non-accelerated filers have less net purchases in the second fiscal quarter, consistent with H2d. To gauge the economic significance of this coefficient, i.e., a difference-in-differences of -6.9% in insider purchases relative to total insider trading, we note that the mean net insider purchase for our sample firms is 14% with a standard deviation of 63%. The corresponding coefficient in column (2) on gross purchases is negative but insignificant. The coefficient on  $2ndqtr_qEvent_tNA_t$  is positive (0.043) and is significant at the 5% level in column (3) on insider selling. In assessing the economic significance of this coefficient, i.e., a

difference-in-differences of 4.3% in insider selling relative to total insider trading, we note that the mean insider selling for our sample is 21% with a standard deviation of 36%.

The results are therefore consistent with H2d and indicate that most of the effects we observe in column (1) are from insider selling in the second fiscal quarter.

**[Insert Table 7 here]**

### 6.5. Reported earnings

Besides insider selling, H2e hypothesizes that non-accelerated filers also can exert downward pressure on their share prices post-SOX by reporting lower earnings in the second fiscal quarter before the filing status testing date. We test this prediction using the following regressions models (26,101 and 26,041 firm-quarter observations for models (6) and (6'), respectively):

$$\begin{aligned} \text{prob}(Pst\_UE_q = 1) = & \text{Logit}(\beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t \\ & + \beta_4 2ndqtr_q + \beta_5 2ndqtr_q NA_t + \beta_6 2ndqtr_q Event_t + \beta_7 2ndqtr_q Event_t NA_t) \end{aligned} \quad (6)$$

$$\begin{aligned} \text{prob}(Pst\_dfl\_UE_q = 1) = & \text{Logit}(\beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t \\ & + \beta_4 2ndqtr_q + \beta_5 2ndqtr_q NA_t + \beta_6 2ndqtr_q Event_t + \beta_7 2ndqtr_q Event_t NA_t) \end{aligned} \quad (6')$$

The dependent variable in model (6),  $Pst\_UE_q$ , is an indicator variable equal to one for positive unexpected earnings in quarter  $q$  ( $UE_q$ ) defined as the quarter  $q$  earnings-per-share ( $EPS$ ) minus the  $EPS$  from the same quarter last year, and zero otherwise. The dependent variable in model (6'),  $Pst\_dfl\_UE_q$ , is based on price-deflated  $EPS$  and is set to one if  $EPS_q/P_{q-1} > EPS_{q-4}/P_{q-5}$ , and zero otherwise. The independent variables are the same as those in the previous section's insider trading models. Our focus similarly is on the variable  $2ndqtr_q Event_t NA_t$ . The coefficient on this variable is predicted to be *negative* in the models according H2e. H3 suggests that the activity of reporting lower earnings hypothesized in H2e lessens when a firm's market value is further away from \$75 million. When we introduce

$Dist75_t$  and its related interactive terms in the above models, we do not find the interactive term  $Dist75_t 2ndqtr_q Event_t NA_t$  to be significant in any of the specifications. For brevity, we exclude the  $Dist75_t$ -related terms from the models.

The estimation results are presented in Table 8. We find that  $2ndqtr_q Event_t NA_t$  has negative coefficients in both models, -0.284 and is significant at the 5% level in column (1) (model (6)), and -0.338 and significant at the 1% level in column (2) (model (6')). The corrected mean marginal effect on  $2ndqtr_q Event_t NA_t$  in column (1) (column (2)) calculated following Norton et al. (2004) is -7% (-8.4%) with a Z-statistic of 2.21 (2.65), both significant at the 1% level. All the marginal effects on  $2ndqtr_q Event_t NA_t$  have the predicted negative sign. As a reference point, we note that the unconditional probability of positive earnings changes for our sample firms is around 50%. The results therefore support H2e that post-SOX non-accelerated filers are more likely to report lower accounting earnings in the second fiscal quarter.<sup>18</sup>

**[Insert Table 8 here]**

### 6.6. Summary of main results

In summary, the results presented in Section 5 on market value appreciation are consistent with H1 that post-SOX non-accelerated filers experience less market value appreciation than control firms. The results in Section 6 on post-SOX non-accelerated filers' actions to stay small are consistent with each of the five sub-hypothesis in H2. Specifically, we find that post-SOX non-accelerated filers undertake less investment, make fewer seasoned equity offerings, pay out more cash in the form of dividends and share repurchases, and engage in more insider selling and report lower accounting earnings in the second fiscal quarter. We also find

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<sup>18</sup> The second fiscal quarter earnings announcement likely occurs during the next fiscal quarter and after the filing status testing date. However, researchers have long documented that price leads earnings (e.g. Beaver et al. 1980 and Kothari and Sloan, 1992), which suggests a substantial portion of the price impact from lower earnings in the second fiscal quarter likely occurs prior to the quarter end.

some support for H3 in the sense that post-SOX the incentives for non-accelerated filers to reduce investment, make fewer secondary offerings, and make more cash payouts weaken when the market value is further away from \$75 million. However, we do not find supporting evidence for H3 in the insider selling and accounting earnings tests. As we note earlier, distance from \$75 million can be a noisy measure of the probability that a non-accelerated filer is expected to cross the threshold within the coming year.

If we view our six tests, one on market value appreciation (H1) and five on the different actions undertaken by non-accelerated filers post-SOX (H2a-H2e), as independent experiments, the probability of all six tests working in our favor purely by chance is 0.016 assuming a binomial distribution with  $n = 6$  and  $p = 0.5$ .

## **7. Conclusions**

The SEC has on various occasions from 2003 – 2006 postponed compliance with Section 404 of the Sarbanes-Oxley Act of 2002 (SOX) for “non-accelerated filers” (firms with market values less than \$75 million). We hypothesize and find that these firms had an incentive to remain below this bright line threshold. Moreover, we document that these firms remained small by undertaking less investment, issuing fewer secondary equity offerings, making more cash payouts through dividends and share repurchases than control firms, and engaging in more insider selling and reporting lower earnings in the second fiscal quarter than control firms.

We contribute to the literature by documenting a heretofore unrecognized consequence of SOX – namely the efforts by non-accelerated filers to keep their market values of equity below \$75 million. Prior studies suggest SOX can change a firm’s cost-benefit tradeoff of participating in U.S. public capital markets. Our results indicate that for firms that do remain public, SOX can also alter their incentives to grow.

We provide additional evidence on the economic consequences of SOX and in particular, its Section 404 provisions on internal controls, for small public companies. Our findings add to the previous literature and are consistent with the view that SOX, especially Section 404, imposes large costs on small businesses.

Finally, our study provides evidence on the economic consequences of the SEC scaling regulation for small companies, which has implications beyond SOX. Scaling regulation dates back to the 1930's when federal securities regulation first began. More importantly, the SEC is currently considering recommendations by the Advisory Committee on Small Public Companies on a wide range of scaling regulations regarding capital formation, corporate governance, corporate disclosure, and financial reporting. Our evidence suggests that when regulations entail large costs for small businesses, one of the unintended consequences of scaling regulation is that firms have incentives to stay small.

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## Appendix: Variable definitions

### A. Dependent variables

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<b>Market value appreciation test</b>	
<i>Less75<sub>t+1</sub></i>	Equals one if the market value of equity at the end of firm-year t, i.e. 2nd fiscal quarter end of fiscal year t+1 (time 2 in Figure 2), is less than \$75 million; zero otherwise.
<i>Mve<sub>t+1</sub></i>	Market value of equity at the end of firm-year t, i.e. 2nd fiscal quarter end of fiscal year t+1 (time 2 in Figure 2)

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<b>Change in investment</b>	
<i>Chinv<sub>t</sub></i>	The change in investment between firm-year t and t-1. Investment is measured by annual capital expenditure (data128) + R&D expenditure (data46) + Advertising expenses (data45) + Acquisition (data129) - Sale of PP&E (data107). The change in investment is then deflated by lagged total assets

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<b>SEO</b>	
<i>SEO<sub>t</sub></i>	The variable SEO is equal to one if there is any seasoned equity offerings in a firm-year t, and zero otherwise.

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<b>Cash payout</b>	
<i>Cashpay<sub>t</sub></i>	Equals one if there is any types of cash payout to shareholders in firm-year t (regular dividend and special dividends, and share repurchases), and zero otherwise.
<i>Chcashpay<sub>t</sub></i>	Equals one if the sum of all three types of cash payout (regular dividend, special dividend and share repurchases) in firm-year t is larger than the previous year. Equals zero if the sums are the same in the two years, and equals -1 if the sum for year t is smaller.

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<b>Insider trading</b>	
<i>Netpercent<sub>r<sub>q</sub></sub></i>	The residual net insider purchases in quarter q from the insider trading prediction model in Cheng and Lo (2006). <i>Netpercent<sub>q</sub></i> Equals (buy-sell)/(buy+sell), where the variable buy is the sum of all shares that insiders “buy” over a fiscal quarter, and the variable “sell” is the sum of all shares that insiders sell over a fiscal quarter.
<i>Buypercent<sub>r<sub>q</sub></sub></i>	The residual gross insider purchases in quarter q from the insider trading prediction model in Cheng and Lo (2006). <i>Buypercent<sub>q</sub></i> is defined as buy/(buy+sell)
<i>Sellpercent<sub>r<sub>q</sub></sub></i>	The residual of insider selling in quarter q from the insider trading prediction model in Cheng and Lo (2006). <i>Sellpercent<sub>q</sub></i> is defined as sell/(buy+sell).

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<b>Quarterly earnings</b>	
<i>Pst_UE<sub>q</sub></i>	An indicator variable equal to one if <i>UE<sub>q</sub></i> is positive and zero otherwise. <i>UE<sub>q</sub></i> , the unexpected earnings per share in quarter q is calculated as earnings per share for fiscal quarter q minus earnings per share from the same quarter last year. Earnings per share come from data19 in COMPUSTAT quarterly file.

$Pst\_dfl\_UE_q$	An indicator variable that is based on price-deflated <i>EPS</i> and is equal to one if $EPS_q/P_{q-1} > EPS_{q-4}/P_{q-5}$ , and zero otherwise
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### **B. Main test variables**

$NA_t$	$NA_t$ equals one if the market value of equity is less than \$75 million at time 1 in year t and at all the previous second fiscal quarter ends, since SEC's introduction of the accelerated and non-accelerated filers concept in September 2002 for event period observations and since fiscal year 1998 for control period observations, and zero otherwise.
$Event_t$	Indicator variable that equals one if an observation belongs to the event period, and zero for control period.
$Dist75_t$	The absolute value of the difference between \$75 million and the firm's market value as of the end of the 2nd fiscal quarter of fiscal year t (time 1 in Figure 2).
$2ndqtr_q$	Indicator variable that equals one for the second fiscal quarter, and zero otherwise.

### C. Control variables

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#### Market value appreciation test

*Emktret<sub>t</sub>* Market return based on the equally-weighted CRSP index for the calendar year prior to the 2nd fiscal quarter end of fiscal year t.

*Mve<sub>t</sub>* The market value of equity at the beginning of the firm-year t, i.e. the end of the 2nd fiscal quarter of fiscal year t (time 1 in Figure 2).

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#### Investment, SEO and Cash payout

*ROA<sub>t-1</sub>* The decile rank of return on assets as of the beginning of fiscal year t. The return on assets is defined as operating income before depreciation (data13)/ total assets (data6).

*MB<sub>t-1</sub>* The decile rank of market-to-book ratios as of the beginning of fiscal year t. The market-to-book is measured as common shares outstanding (data25)\*closing price (data199)/ total assets (data6).

*Sales<sub>t-1</sub>* The decile rank of total sales (data12) at the beginning of the fiscal year t.

*FCF<sub>t-1</sub>* The decile rank of asset-deflated free cash flow for a firm as of the beginning of fiscal year t. Free cash flow is calculated as cash and marketable securities (data1) - Accounts payable (data70) - other current liability (data72). We then deflated the free cash flow with total assets (data6).

*Older<sub>t-1</sub>* Equals one if a firm has been on CRSP for at least 9 years.

*Stdret<sub>t-1</sub>* The standard deviation of monthly return of the 12 months prior to the 2nd fiscal quarter end of fiscal year t.

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**Table 1. Key Events and Definitions**

April 12, 2002	The SEC proposed to accelerate the filing of quarterly reports and annual reports to modernize the periodic reporting system. [Source: SEC Release No. 33-8089.]
July 30, 2002	The Sarbanes-Oxley Act was signed into law.
September 5, 2002	<p>The SEC adopted final rules regarding the acceleration of filing deadlines for reports on Form 10-K and Form 10-Q. The phase-in period for accelerated deadlines of quarterly and annual reports will begin for reports filed by companies that meet the definition of "accelerated filer" as of their first fiscal year ending on or after December 15, 2002.</p> <p>An accelerated filer is an issuer that:</p> <ul style="list-style-type: none"><li>• had a public float of at least \$75 million as of the last business day of the most recently completed second fiscal quarter;</li><li>• as of such fiscal year-end has been subject to the reporting requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 for at least 12 calendar months;</li><li>• has filed at least one annual report under the Exchange Act; and</li><li>• is not eligible to file abbreviated reports on Forms 10-KSB and 10-QSB.</li></ul> <p>In general, an issuer is eligible to use Forms 10-KSB and 10-QSB if both its annual revenues and its public float, based on the closing price on any day within 60 days prior to fiscal year-end, are less than \$25 million.</p> <p>Once a company becomes an accelerated filer, it remains an accelerated filer regardless of whether it continues to have a public float of \$75 million or more, except that if the company subsequently becomes eligible to use Forms 10-KSB and 10-QSB, it will cease to be an accelerated filer until such time as it again satisfies the "accelerated filer" definition. [Source: SEC Release No. 33-8128]</p>
May 27, 2003	The SEC voted to adopt rules concerning management's report on internal control (Section 404). Accelerated filers are expected to comply for fiscal years on or after June 15, 2004. All other issuers will be required to comply for their fiscal years ending on or after April 15, 2005. [Source: SEC Press Release No. 2003-66]

May 28, 2003	President George W. Bush signed the Jobs and Growth Tax Relief Reconciliation Act of 2003. The tax reform lowered the statutory personal tax rate for dividends from a maximum rate of 38.1% to a flat rate of 15%. It applied retroactively from the beginning of 2003.
Feb 24, 2004	The SEC approved an extension of the original compliance dates for the amendments related to internal control reporting. The compliance dates for companies that are “accelerated filers,” are extended to fiscal years ending on or after November 15, 2004 (an extension of 5 months), and for non-accelerated filers and foreign private issuers, to fiscal years ending on or after July 15, 2005 (an extension of 3 months). [Source: SEC Press Release NO. 2004-21]
March 2, 2005	The SEC extended the Section 404 compliance dates for non-accelerated filers and foreign private issuers to its first fiscal year ending on or after July 15, 2006 (an extension of 1 year). [Source: SEC Press Release 2005-25]
September 21, 2005	The SEC voted to propose for extending the Section 404 compliance dates for non-accelerated filers to its first fiscal year ending on or after July 15, 2007 (an extension of 1 year) and adjust definition for accelerated filers. [Source: SEC Press Release NO. 2005-134]
December 21, 2005	SEC issued final rule regarding exiting the definition of accelerated filer status to provide easier exit. Under the new rules, a company may exit the accelerated filer status in the same year when their public float has dropped below \$50 million. The exiting rule for the large accelerated filer status is below \$500 million (from 700 million). [Source: SEC Release No. 33-8644; 34-52989]
August 9, 2006	The SEC proposed to provide further relief for non-accelerated filers regarding the Section 404 compliance dates. The compliance date is moved to its first fiscal year ending on or after December 15, 2007 (an extension of 6 months); the compliance date to provide an auditor’s attestation report on interval control would be moved to a fiscal year ending on or after December 15, 2008. [Source: SEC Press Release No. 2006-136. SEC Release No. 33-8731]

**Table 2. Sample selection****Panel A: Base sample**

	Observations dropped	# Firm-year observations	# firms
Compustat firms with fiscal year end data 1999-2005		50981	
Less: foreign firms and non-common equity	8543	42438	
Less: financial institutions and regulated industries	13771	28667	
Less: not in the control or the event period	9376	19291	
Less: firms with market value of equity at 2nd fiscal quarter end higher than 150 million	10581	8710	
Less: firms without previous financial to calculate lagROA, lagMB, lagSales, lag free cash flow or less than 3 months in either the event or control period	567	8143	
The base sample with firm-year observations		8143	
Event Period		3310	1774
Non-accelerated filers (NA = 1)		1904	929
Accelerated filers (NA = 0)		1406	845
Control Period		4833	2831
Non-accelerated filers (NA = 1)		2817	1526
Accelerated filers (NA = 0)		2016	1305

	Total
The base sample with firm-year observations	8143
The base sample with firm-quarter observations	26718

**Panel B: Sample selection for each test**

		# observations
<b>Market value appreciation test (Section 5)</b>		
The base sample with firm-year observations		8143
Less: firms without market value of equity in the following year	4369	
Resulting Firm-year observations		3774
<b>Investment, SEO, and cash payout (Sections 6.1-6.3)</b>		
The base sample with firm-year observations		8143
<b>Insider Trading (Section 6.4)</b>		
The base sample with firm-quarter observations		26718
Less missing lags of the following quarterly variables: roe, buy-and-hold return	289	
Resulting Firm-quarter observations		26429
<b>Quarterly earnings (Section 6.5)</b>		
The base sample with firm-quarter observations		26718
Less missing changes in quarterly earnings	617	
Resulting Firm-quarter observations		26101
<b>Deflated Quarterly earnings (Section 6.5)</b>		
The base sample with firm-quarter observations		26718
Less missing changes in deflated quarterly earnings	677	
Resulting Firm-quarter observations		26041

**Table 3. Summary statistics****Panel A: firm-year observations**

The raw values of control variables are presented in the summary statistics and the correlation matrix. Variable definitions are in the Appendix.

**NA=0 (Accelerated filers)**

Variables	N	Mean	Median	Std dev
<i>Less75<sub>t+1</sub></i>	1227	0.510	0.000	0.500
<i>Chinv<sub>t</sub></i>	3422	-0.002	-0.006	0.287
<i>SEO<sub>t</sub></i>	3422	0.032	0.000	0.176
<i>Cashpay<sub>t</sub></i>	3422	0.118	0.000	0.323
<i>Chcashpay<sub>t</sub></i>	3422	-0.003	0.000	0.382
<i>dist75<sub>t</sub></i>	3422	31.71	29.21	20.72
<i>Event<sub>t</sub></i>	3422	0.41	0.00	0.49
<i>Emktret<sub>t</sub></i>	1227	0.32	0.34	0.24
<i>Mve<sub>t</sub></i>	1227	76.05	73.58	37.96
<i>ROA<sub>t-1</sub></i>	3422	-0.03	0.07	0.33
<i>MB<sub>t-1</sub></i>	3422	3.47	1.62	24.94
<i>Sales<sub>t-1</sub></i>	3422	198.66	86.01	365.30
<i>FCF<sub>t-1</sub></i>	3422	0.04	-0.05	0.31
<i>Older<sub>t-1</sub></i>	3422	0.45	0.00	0.50
<i>Stdret<sub>t-1</sub></i>	3422	0.21	0.18	0.13

**NA=1 (Non-Accelerated filers)**

Variables	N	Mean	Median	Std dev
<i>Less75<sub>t+1</sub></i>	2547	0.889	1.000	0.314
<i>Chinv<sub>t</sub></i>	4721	-0.003	-0.003	0.226
<i>SEO<sub>t</sub></i>	4721	0.010	0.000	0.097
<i>Cashpay<sub>t</sub></i>	4721	0.077	0.000	0.267
<i>Chcashpay<sub>t</sub></i>	4721	0.004	0.000	0.313
<i>dist75<sub>t</sub></i>	4721	48.88	53.39	18.32
<i>Event<sub>t</sub></i>	4721	0.40	0.00	0.49
<i>Emktret<sub>t</sub></i>	2547	0.36	0.34	0.24
<i>Mve<sub>t</sub></i>	2547	34.62	25.04	30.37
<i>ROA<sub>t-1</sub></i>	4721	-0.04	0.06	0.37
<i>MB<sub>t-1</sub></i>	4721	1.99	1.27	17.78
<i>Sales<sub>t-1</sub></i>	4721	70.70	29.32	181.52
<i>FCF<sub>t-1</sub></i>	4721	-0.02	-0.08	0.29
<i>Older<sub>t-1</sub></i>	4721	0.54	1.00	0.50
<i>Stdret<sub>t-1</sub></i>	4721	0.22	0.18	0.18

**Table 3. Summary statistics (continued)****Panel B: firm-quarter observations.**

Variable definitions are in the Appendix.

**NA=0 (Accelerated filers)**

Variables	N	Mean	Median	Std dev
<i>Netpercent<sub>q</sub></i>	11061	0.13	0.00	0.65
<i>Buypercent<sub>q</sub></i>	11061	0.38	0.06	0.43
<i>Sellpercent<sub>q</sub></i>	11061	0.25	0.00	0.38
<i>Pst_UE<sub>q</sub></i>	10937	0.50	0.00	0.50
<i>Pst_dfl_UE<sub>q</sub></i>	10914	0.47	0.00	0.50

**NA=1 (Non-Accelerated filers)**

Variables	N	Mean	Median	Std dev
<i>Netpercent<sub>q</sub></i>	15368	0.15	0.00	0.61
<i>Buypercent<sub>q</sub></i>	15368	0.33	0.00	0.44
<i>Sellpercent<sub>q</sub></i>	15368	0.19	0.00	0.35
<i>Pst_UE<sub>q</sub></i>	15164	0.51	1.00	0.50
<i>Pst_dfl_UE<sub>q</sub></i>	15127	0.49	0.00	0.50

**Table 4. Correlation Matrix for firm-year observations**

Variable	<i>Less75<sub>t+1</sub></i>	<i>Chinv<sub>t</sub></i>	<i>SEO<sub>t</sub></i>	<i>Cashpay<sub>t</sub></i>	<i>Chcashpay<sub>t</sub></i>	<i>NA<sub>t</sub></i>	<i>dist75<sub>t</sub></i>	<i>Event<sub>t</sub></i>	<i>Emktret<sub>t</sub></i>	<i>Mve<sub>t</sub></i>	<i>ROA<sub>t-1</sub></i>	<i>MB<sub>t-1</sub></i>	<i>Sales<sub>t-1</sub></i>	<i>FCF<sub>t-1</sub></i>	<i>Older<sub>t-1</sub></i>	<i>Stdret<sub>t-1</sub></i>
<i>Less75<sub>t+1</sub></i>		<b>-0.08</b>	<b>-0.10</b>	<b>-0.10</b>	<b>-0.04</b>	<b>0.72</b>	<b>0.22</b>	<b>-0.09</b>	<b>-0.05</b>	<b>-0.56</b>	<b>-0.09</b>	<b>-0.18</b>	<b>-0.24</b>	<b>-0.09</b>	0.02	<b>0.06</b>
<i>Chinv<sub>t</sub></i>	<b>-0.07</b>		<b>0.05</b>	<b>0.03</b>	<b>0.03</b>	<b>0.02</b>	<b>-0.04</b>	<b>0.08</b>	<b>0.08</b>	<b>-0.09</b>	<b>0.14</b>	<b>0.09</b>	<b>-0.06</b>	<b>0.07</b>	<b>0.08</b>	<b>-0.06</b>
<i>SEO<sub>t</sub></i>	<b>-0.10</b>	<b>0.05</b>		<b>-0.04</b>	0.00	<b>-0.08</b>	<b>-0.05</b>	<b>0.04</b>	<b>-0.03</b>	<b>0.06</b>	<b>-0.03</b>	<b>0.04</b>	-0.02	<b>0.04</b>	<b>-0.03</b>	<b>0.04</b>
<i>Cashpay<sub>t</sub></i>	<b>-0.10</b>	0.01	<b>-0.04</b>		<b>0.32</b>	<b>-0.07</b>	<b>-0.06</b>	<b>0.02</b>	<b>0.02</b>	<b>0.10</b>	<b>0.22</b>	<b>-0.09</b>	<b>0.20</b>	<b>-0.04</b>	<b>0.18</b>	<b>-0.29</b>
<i>Chcashpay<sub>t</sub></i>	<b>-0.04</b>	0.01	0.00	<b>0.31</b>		0.01	0.00	<b>0.08</b>	<b>0.03</b>	<b>-0.03</b>	<b>0.05</b>	<b>0.03</b>	-0.01	0.00	0.01	<b>-0.04</b>
<i>NA<sub>t</sub></i>	<b>0.72</b>	0.00	<b>-0.08</b>	<b>-0.07</b>	0.01		<b>0.39</b>	-0.01	<b>-0.04</b>	<b>-0.76</b>	<b>-0.05</b>	<b>-0.14</b>	<b>-0.32</b>	<b>-0.10</b>	<b>0.09</b>	<b>0.03</b>
<i>dist75<sub>t</sub></i>	<b>0.22</b>	<b>-0.03</b>	<b>-0.05</b>	<b>-0.06</b>	0.01	<b>0.40</b>		<b>-0.09</b>	<b>-0.04</b>	<b>-0.51</b>	<b>-0.06</b>	<b>-0.17</b>	<b>-0.22</b>	<b>-0.10</b>	<b>0.03</b>	<b>0.09</b>
<i>Event<sub>t</sub></i>	<b>-0.09</b>	<b>0.03</b>	<b>0.04</b>	<b>0.02</b>	<b>0.08</b>	-0.01	<b>-0.09</b>		<b>0.06</b>	<b>-0.02</b>	<b>-0.09</b>	<b>0.03</b>	<b>-0.03</b>	<b>0.08</b>	<b>0.19</b>	<b>-0.18</b>
<i>Emktret<sub>t</sub></i>	<b>-0.06</b>	<b>0.07</b>	-0.02	<b>0.03</b>	<b>0.05</b>	<b>-0.03</b>	<b>-0.04</b>	<b>0.28</b>		<b>-0.06</b>	0.00	<b>0.11</b>	-0.02	-0.01	<b>0.02</b>	<b>-0.07</b>
<i>Mve<sub>t</sub></i>	<b>-0.45</b>	<b>-0.06</b>	<b>0.02</b>	<b>0.04</b>	<b>-0.03</b>	<b>-0.55</b>	<b>-0.22</b>	<b>-0.06</b>	<b>-0.08</b>		<b>0.09</b>	<b>0.16</b>	<b>0.42</b>	<b>0.11</b>	<b>-0.08</b>	<b>-0.16</b>
<i>ROA<sub>t-1</sub></i>	<b>-0.04</b>	<b>0.12</b>	<b>-0.03</b>	<b>0.15</b>	<b>0.02</b>	<b>-0.02</b>	-0.01	<b>-0.05</b>	0.00	0.02		<b>-0.09</b>	<b>0.47</b>	<b>-0.27</b>	<b>0.17</b>	<b>-0.37</b>
<i>MB<sub>t-1</sub></i>	<b>-0.03</b>	0.00	0.01	-0.02	0.00	<b>-0.03</b>	<b>-0.03</b>	0.01	<b>0.02</b>	0.01	0.01		<b>-0.33</b>	<b>0.16</b>	<b>-0.08</b>	<b>0.14</b>
<i>Sales<sub>t-1</sub></i>	<b>-0.19</b>	<b>-0.02</b>	0.01	<b>0.14</b>	0.01	<b>-0.22</b>	<b>-0.12</b>	<b>-0.02</b>	<b>-0.02</b>	<b>0.24</b>	<b>0.14</b>	<b>-0.03</b>		<b>-0.13</b>	<b>0.11</b>	<b>-0.29</b>
<i>FCF<sub>t-1</sub></i>	<b>-0.09</b>	0.02	<b>0.05</b>	<b>-0.05</b>	0.00	<b>-0.11</b>	<b>-0.10</b>	<b>0.08</b>	0.00	<b>0.09</b>	<b>-0.23</b>	<b>0.04</b>	<b>-0.26</b>		<b>-0.13</b>	<b>0.06</b>
<i>Older<sub>t-1</sub></i>	0.02	<b>0.03</b>	<b>-0.03</b>	<b>0.18</b>	0.01	<b>0.09</b>	<b>0.03</b>	<b>0.19</b>	<b>0.07</b>	<b>-0.08</b>	<b>0.16</b>	<b>-0.02</b>	<b>0.06</b>	<b>-0.14</b>		<b>-0.26</b>
<i>Stdret<sub>t-1</sub></i>	<b>0.06</b>	-0.02	0.01	<b>-0.19</b>	-0.02	<b>0.05</b>	<b>0.07</b>	<b>-0.14</b>	<b>-0.06</b>	<b>-0.06</b>	<b>-0.28</b>	<b>0.03</b>	<b>-0.09</b>	<b>0.05</b>	<b>-0.19</b>	

Pearson correlation coefficients appear in the lower diagonal and Spearman rank correlation coefficients appear in the upper diagonal. Bold numbers stand for correlations that are significant at 10% level for two-tailed tests. Variable definitions are in the Appendix.

**Table 5. Market value appreciate test**

$$\text{prob}(Less75_{t+1}=1) = \text{Logit}(\beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 Mktret_t + \beta_5 Mve_t) \quad (1)$$

$$Mve_{t+1} = \beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 Mktret_t + \beta_5 Mve_t \quad (1')$$

Dependent variable		<i>Less75<sub>t+1</sub></i>		<i>Mve<sub>t+1</sub></i>		
		(1)		(2)		
Variables	Predict. Signs	Coef. (std. error)		Variables	Predict. Signs	Coef. (std. error)
<i>Intercept</i>		4.177 *** (0.220)		<i>Intercept</i>		2.238 *** (1.962)
<i>NA<sub>t</sub></i>		-0.249 (0.175)		<i>NA<sub>t</sub></i>		4.137 ** (1.677)
<i>Event<sub>t</sub></i>		-0.736 *** (0.142)		<i>Event<sub>t</sub></i>		12.475 *** (1.624)
<i>Event<sub>t</sub>*NA<sub>t</sub></i>	+	<b>0.668</b> *** <b>(0.192)</b>		<i>Event<sub>t</sub>*NA<sub>t</sub></i>	-	<b>-9.079</b> *** <b>(1.904)</b>
<i>Emktret<sub>t</sub></i>	-	-1.539 *** (0.228)		<i>Emktret<sub>t</sub></i>	+	22.134 *** (2.063)
<i>Mve<sub>t</sub></i>	-	-0.038 *** (0.002)		<i>Mve<sub>t</sub></i>	+	0.713 *** (0.019)
N		3774		N		3774
<i>Less75=1</i>		2890				
Max-rescaled R2		0.41		Adj. R2		0.50

Results are based on logit regression in column (1) and OLS regression in column (2). Standard errors are in parentheses. Max-rescaled R-square is the original R2 divided by its upper bound, to account for the fact that the upper bound of the generalized R2 is less than 1 because the dependent variable is discrete (binary). Significance tests are based on two-tailed tests, where \*, \*\*, and \*\*\* corresponds to a 10%, 5% and 1% significance levels. Main test variables are bolded. Variable definitions are in the Appendix.

**Table 6. Tests on changes in investments, SEO and cash payout**

$$\begin{aligned} \text{Chinv}_{t+1} = & \beta_0 + \beta_1 NA_t + \beta_2 \text{Event}_t + \beta_3 \text{Event}_t NA_t + \beta_4 \text{Dist75}_t \\ & + \beta_5 \text{Dist75}_t NA_t + \beta_6 \text{Dist75}_t \text{Event}_t + \beta_7 \text{Dist75}_t \text{Event}_t NA_t + \sum_j \beta_j \text{Controls} \end{aligned} \quad (2)$$

$$\begin{aligned} \text{prob}(\text{SEO}_t = 1) = & \text{Logit}(\beta_0 + \beta_1 NA_t + \beta_2 \text{Event}_t + \beta_3 \text{Event}_t NA_t + \beta_4 \text{Dist75}_t \\ & + \beta_5 \text{Dist75}_t NA_t + \beta_6 \text{Dist75}_t \text{Event}_t + \beta_7 \text{Dist75}_t \text{Event}_t NA_t + \sum_j \beta_j \text{Controls}) \end{aligned} \quad (3)$$

$$\begin{aligned} \text{prob}(\text{Cashpay}_t = 1) = & \text{Logit}(\beta_0 + \beta_1 NA_t + \beta_2 \text{Event}_t + \beta_3 \text{Event}_t NA_t + \beta_4 \text{Dist75}_t \\ & + \beta_5 \text{Dist75}_t NA_t + \beta_6 \text{Dist75}_t \text{Event}_t + \beta_7 \text{Dist75}_t \text{Event}_t NA_t + \sum_j \beta_j \text{Controls}) \end{aligned} \quad (4)$$

$$\begin{aligned} \text{proc}(\text{Chcashpay}_t = 1) = & \text{Logit}(\beta_0 + \beta_1 NA_t + \beta_2 \text{Event}_t + \beta_3 \text{Event}_t NA_t + \beta_4 \text{Dist75}_t \\ & + \beta_5 \text{Dist75}_t NA_t + \beta_6 \text{Dist75}_t \text{Event}_t + \beta_7 \text{Dist75}_t \text{Event}_t NA_t + \sum_j \beta_j \text{Controls}) \end{aligned} \quad (4')$$

Dependent variables	<i>Chinv<sub>t</sub></i>		<i>Pr(SEO<sub>t</sub> = 1)</i>		<i>Pr(Cashpay<sub>t</sub> = 1)</i>		<i>Pr(Chcashpay<sub>t</sub> = 1)</i>	
	Predict. Signs	Coef. (Stderr.)	Coef. (Stderr.)	Predict. Signs	Coef. (Stderr.)	Coef. (Stderr.)	Coef. (Stderr.)	
<i>Intercept</i>		-0.021 (0.018)	-3.472 (0.518)		-4.758 *** (0.510)	-4.717 (0.456)	***	
<i>NA<sub>t</sub></i>		0.056 *** (0.018)	1.586 *** (0.482)		-0.220 (0.414)	-0.160 (0.388)		
<i>Event<sub>t</sub></i>		0.022 (0.016)	0.715 * (0.387)		-0.143 (0.331)	0.177 (0.285)		
<i>Event<sub>t</sub>*NA<sub>t</sub></i>	-	<b>-0.052</b> ** <b>(0.026)</b>	<b>-1.580</b> ** <b>(0.690)</b>	+	<b>1.196</b> ** <b>(0.561)</b>	<b>1.018</b> ** <b>(0.489)</b>	**	
<i>Dist75<sub>t</sub></i>		0.000 (0.000)	0.011 * (0.007)		-0.001 (0.005)	0.002 (0.005)		
<i>Dist75<sub>t</sub>*NA<sub>t</sub></i>		-0.001 *** (0.000)	-0.075 *** (0.013)		-0.001 (0.009)	0.000 (0.009)		

<i>Dist75<sub>t</sub>*Event<sub>t</sub></i>		0.000		-0.004		0.010		0.007	
		(0.000)		(0.009)		(0.008)		(0.007)	
<b><i>Dist75<sub>t</sub>*Event<sub>t</sub>*NA<sub>t</sub></i></b>	+	<b>0.001</b>	*	<b>0.042</b>	**	<b>-0.021</b>	*	<b>-0.022</b>	**
		<b>(0.001)</b>		<b>(0.018)</b>		<b>(0.012)</b>		<b>(0.011)</b>	
<i>ROA<sub>t-1</sub></i>		0.022	***	-0.038		0.256	***	0.240	***
		(0.002)		(0.070)		(0.030)		(0.026)	
<i>MB<sub>t-1</sub></i>		0.005	**	0.038		-0.098	***	-0.081	***
		(0.002)		(0.069)		(0.029)		(0.024)	
<i>Sales<sub>t-1</sub></i>		-0.019	***	-0.185	**	0.037		0.077	**
		(0.003)		(0.089)		(0.038)		(0.033)	
<i>FCF<sub>t-1</sub></i>		0.001		-0.022		0.077	**	0.073	***
		(0.002)		(0.071)		(0.030)		(0.025)	
<i>Older<sub>t-1</sub></i>		0.008		-0.428	**	0.429	***	0.565	***
		(0.006)		(0.179)		(0.135)		(0.121)	
<i>Stdret<sub>t-1</sub></i>		-0.005		0.012		-4.912	***	-3.880	***
		(0.019)		(0.580)		(0.852)		(0.742)	
<i>lag(dependent variable)</i>		-0.102	***	1.061	**	4.478	***	2.802	***
		(0.009)		(0.442)		(0.126)		(0.124)	
N		8143		8143		8143		8143	
Dependent Variable = 1				153		769		508	
Adj. R2/Max-rescaled R2		0.03		0.10		0.65		0.25	

Results with the change in investment as the dependent variable are based on an OLS regression. The regressions for columns (2) to (3) are based on binary logit regressions. Column (4) is based on a generalized ordered logit regression, which adds no restriction of proportional odds for different ordinal values. Standard errors are in parentheses. Max-rescaled R2 is the same as Pseudo R2, which is the original R2 divided by its upper bound, to account for the fact that the upper bound of the generalized R2 is less than 1 because the dependent variable is discrete (binary). Significance tests are based on two-tailed tests, where \*, \*\*, and \*\*\* corresponds to a 10%, 5% and 1% significance levels. Main test variables are bolded. The control variables are ROA, MB, Sales, FCF, Older, Stdret, and the lagged dependent variables. Variable definitions are in the Appendix.

**Table 7. Insider trading test**

**Panel A. Main test**

$$Netpercent\_r_q = \beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 2ndqtr_q + \beta_5 2ndqtr_q NA_t + \beta_6 2ndqtr_q Event_t + \beta_7 2ndqtr_q Event_t NA_t \quad (5)$$

$$Buypercent\_r_q = \beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 2ndqtr_q + \beta_5 2ndqtr_q NA_t + \beta_6 2ndqtr_q Event_t + \beta_7 2ndqtr_q Event_t NA_t \quad (5')$$

$$Sellpercent\_r_q = \beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t + \beta_4 2ndqtr_q + \beta_5 2ndqtr_q NA_t + \beta_6 2ndqtr_q Event_t + \beta_7 2ndqtr_q Event_t NA_t \quad (5'')$$

dependent variable	<i>Netpercent_r_q</i>		<i>Buypercent_r_q</i>		<i>Sellpercent_r_q</i>	
	predicted	Coef.	Coef.	predicted	Coef.	
Variables	signs	(stderr.)	(stderr.)	signs	(stderr.)	
<i>Intercept</i>		0.016 **	-0.002		-0.018 ***	
		(0.008)	(0.006)		(0.005)	
<i>NA<sub>t</sub></i>		-0.016	-0.003		0.014 **	
		(0.011)	(0.007)		(0.006)	
<i>Event<sub>t</sub></i>		-0.052 ***	-0.010		0.042 ***	
		(0.013)	(0.009)		(0.007)	
<i>Event<sub>t</sub>*NA<sub>t</sub></i>		0.006	-0.011		-0.017 *	
		(0.017)	(0.012)		(0.010)	
<i>2ndqtr<sub>q</sub></i>		0.025	0.026 **		0.001	
		(0.018)	(0.012)		(0.010)	
<i>2ndqtr<sub>q</sub>*NA<sub>t</sub></i>		0.031	0.018		-0.013	
		(0.024)	(0.016)		(0.013)	
<i>2ndqtr<sub>q</sub>*Event<sub>t</sub></i>		0.080 ***	0.039 **		-0.040 **	
		(0.030)	(0.020)		(0.017)	
<b><i>2ndqtr<sub>q</sub>*Event<sub>t</sub>*NA<sub>t</sub></i></b>	-	<b>-0.069 *</b>	<b>-0.027</b>	+	<b>0.043 **</b>	
		<b>(0.039)</b>	<b>(0.027)</b>		<b>(0.022)</b>	
N		26429	26429		26429	
Adj. R2		0.003	0.002		0.002	

Results are based on OLS regressions. Standard errors are in parentheses. Significance tests are based on two-tailed tests, where \*, \*\*, and \*\*\* corresponds to a 10%, 5% and 1% significance levels.

The dependent variables are residuals from prediction models for insider trading shares from panel A. Main test variables are bolded. Variable definitions are in the Appendix.

**Table 7. Insider trading test**  
**Panel B. Prediction models for insider trading**

$$Netpercent_q = \alpha_0 + \alpha_1 option\_shrout_{q-1} + \alpha_2 ret_{q-1} + \alpha_3 roe_{q-1} + \alpha_4 size_{q-1} + \alpha_5 mktbk_{q-1} + \alpha_6 netpercent_{q-1} \quad (1)$$

$$Buypercent_q = \alpha_0 + \alpha_1 option\_shrout_{q-1} + \alpha_2 ret_{q-1} + \alpha_3 roe_{q-1} + \alpha_4 size_{q-1} + \alpha_5 mktbk_{q-1} + \alpha_6 buypercent_{q-1} + \alpha_7 sellpercent_{q-1} \quad (2)$$

$$Sellpercent_q = \alpha_0 + \alpha_1 option\_shrout_{q-1} + \alpha_2 ret_{q-1} + \alpha_3 roe_{q-1} + \alpha_4 size_{q-1} + \alpha_5 mktbk_{q-1} + \alpha_6 buypercent_{q-1} + \alpha_7 sellpercent_{q-1} + \varepsilon_t \quad (3)$$

Dependent var.	<i>Netpercent<sub>q</sub></i> (1) (buy-sell)/(buy+sell)		<i>Buypercent<sub>q</sub></i> (2) sell/(buy+sell)		<i>Sellpercent<sub>q</sub></i> (3) buy/(buy+sell)	
Intercept	0.189	***	0.176	***	-0.010	
	(0.013)		(0.009)		(0.008)	
<i>option_shrout<sub>q-1</sub></i>	0.417	**	0.379	***	-0.032	
	(0.165)		(0.114)		(0.092)	
<i>Ret<sub>q-1</sub></i>	-0.053	***	-0.019	***	0.034	***
	(0.007)		(0.005)		(0.004)	
<i>Roe<sub>q-1</sub></i>	0.000		0.000		0.000	
	(0.001)		(0.000)		(0.000)	
<i>Size<sub>q-1</sub></i>	-0.022	***	0.019	***	0.042	***
	(0.004)		(0.002)		(0.002)	
<i>Mktbk<sub>q-1</sub></i>	0.000		0.000		0.000	
	(0.000)		(0.000)		(0.000)	
<i>Netpercent<sub>q-1</sub></i>	0.237	***				
	(0.006)					
<i>Buypercent<sub>q-1</sub></i>			0.277	***	0.268	***
			(0.006)		(0.006)	
<i>Sellpercent<sub>q-1</sub></i>			0.044	***	0.031	***
			(0.008)		(0.005)	
N	26429		26429		26429	
Adj. R2	0.06		0.08		0.11	

Results are based on OLS regressions. Standard errors are in parentheses. Significance tests are based on two-tailed tests, where \*, \*\*, and \*\*\* corresponds to a 10%, 5% and 1% significance levels. *Option\_shrout<sub>q-1</sub>*: The shares of options granted in quarter q-1 deflated by the number of shares outstanding in quarter q-1. *Ret<sub>q-1</sub>*: The buy-and-hold return for quarter q-1. *Roe<sub>q-1</sub>*: The income before extraordinary items (data25) for quarter q-1 from Compustat quarterly files deflated by the beginning book value of assets (data59) at the beginning of quarter q-1. *Size<sub>q-1</sub>*: The market value measured at the beginning of quarter q. *Mktbk<sub>q-1</sub>*: The market-to-book ratios at the beginning of quarter q.

**Table 8. Test on accounting earnings**

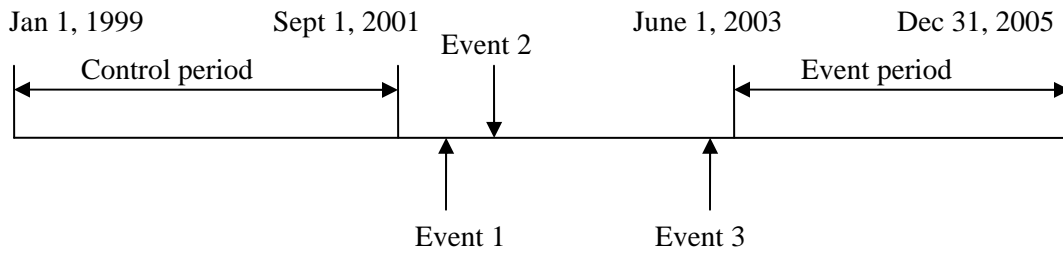
$$\begin{aligned} \text{prob}(Pst\_UE_q = 1) = & \text{Logit}(\beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t \\ & + \beta_4 2ndqtr_q + \beta_5 2ndqtr_q NA_t + \beta_6 2ndqtr_q Event_t + \beta_7 2ndqtr_q Event_t NA_t) \end{aligned} \quad (6)$$

$$\begin{aligned} \text{prob}(Pst\_dfl\_UE_q = 1) = & \text{Logit}(\beta_0 + \beta_1 NA_t + \beta_2 Event_t + \beta_3 Event_t NA_t \\ & + \beta_4 2ndqtr_q + \beta_5 2ndqtr_q NA_t + \beta_6 2ndqtr_q Event_t + \beta_7 2ndqtr_q Event_t NA_t) \end{aligned} \quad (6')$$

Dependent variable	Pr( $Pst\_UE_q = 1$ )		Pr( $Pst\_Dfl\_UE_q = 1$ )	
	(1)		(2)	
	Predict.	Coef.	Coef.	
Variables	Signs	(Stderr.)	(Stderr.)	
<i>Intercept</i>		-0.156 ***	-0.119 **	
		(0.047)	(0.047)	
<i>NA<sub>t</sub></i>		0.204 **	0.028	
		(0.080)	(0.080)	
<i>Event<sub>t</sub></i>		0.237 ***	0.076	
		(0.074)	(0.074)	
<i>Event<sub>t</sub>*NA<sub>t</sub></i>		-0.055	-0.040	
		(0.120)	(0.120)	
<i>2ndqtr<sub>q</sub></i>		0.016	-0.084	
		(0.059)	(0.060)	
<i>2ndqtr<sub>q</sub>*NA<sub>t</sub></i>		-0.029	0.026	
		(0.078)	(0.078)	
<i>2ndqtr<sub>q</sub>*Event<sub>t</sub></i>		0.250 **	0.276 ***	
		(0.099)	(0.098)	
<b><i>2ndqtr<sub>q</sub>*Event<sub>t</sub>*NA<sub>t</sub></i></b>	-	<b>-0.284 **</b>	<b>-0.338 ***</b>	
		<b>(0.128)</b>	<b>(0.128)</b>	
N		26101	26041	
Dependent variable = 1		13228	12561	
Max-Rescaled R2		0.007	0.005	

Results are based on logit regressions. Standard errors are in parentheses. Max-rescaled R-square is the original R2 divided by its upper bound, to account for the fact that the upper bound of the generalized R2 is less than 1 because the dependent variable is discrete (binary). Significance tests are based on two-tailed tests, where \*, \*\*, and \*\*\* corresponds to a 10%, 5% and 1% significance levels. Main test variables are bolded. Variable definitions are in the Appendix.

**Figure 1. Time line of event period and control period**



Event 1: July 30, 2002 the Sarbanes-Oxley Act was signed into law.

Event 2: Sept 5, 2002 SEC adopted final rules on the acceleration of 10-K and 10-Q filing deadlines.

Event 3: May 27, 2003 SEC voted to adopt rules regarding Section 404 of SOX.

**Figure 2. Definition of a firm-year based on two consecutive 2<sup>nd</sup> fiscal quarter ends**

