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# The Unintended Effects of the Sarbanes–Oxley Act

by

VIDHI CHHAOCHHARIA, CLEMENS A. OTTO, AND VIKRANT VIG\*

The Sarbanes–Oxley Act (SOX) was passed in the wake of several scandals that rocked corporate America in 2001 and 2002. The objective behind SOX was to improve corporate governance by improving accounting disclosures. Compliance with Section 404 is considered by many to be the most costly requirement of SOX and has been argued to be a disproportionate burden for small firms. Consequently, firms with a public float below \$75 million were granted several exemptions from compliance. We document an unintended effect of these exemptions: a weakening of corporate governance through a weakening of the market for corporate control. (JEL: G34, G38)

## *I Introduction*

The Sarbanes–Oxley Act of 2002 was introduced after a series of corporate scandals including those leading to the bankruptcy of Enron and WorldCom and the collapse of Arthur Andersen. It has been commonly considered the single most important piece of securities legislation pertaining to corporate governance and financial disclosure since the Securities Acts of the 1930s. SOX was intended to restore investor confidence by placing new rules and restrictions on several corporate entities in order to improve the accuracy and reliability of corporate disclosures. Broadly speaking, SOX was aimed at improving corporate governance for public U.S. companies.

In this paper, we provide evidence of an unintended effect of the SOX legislation on small public U.S. firms (see also ROMANO [2005, p. 1589]). More precisely, we find that exempting nonaccelerated filers – firms with a public float of less than \$75 million – from compliance with Section 404 has lowered the takeover activity involving such firms and led to a reduction in the takeover premiums that were paid in the acquisitions. These results suggest that SOX, which was drafted as a reform

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to strengthen governance, may in fact have weakened corporate governance for nonaccelerated filers (*small firms*) by adversely affecting the market for corporate control.

Significant changes in governance structure, accounting standards, and reporting were introduced on account of the new regulations, which imposed substantial compliance costs, especially on small companies (ENGEL, HAYES, AND WANG [2007]; LEUZ [2007]; PIOTROSKI AND SRINIVASAN [2008]; ILIEV [2010]). In addition, scholars have suggested that SOX altered the incentives to take risks (RIBSTEIN [2002]; ROMANO [2005]; HOLMSTROM AND KAPLAN [2003]; BARGERON, LEHN, AND ZUTTER [2010]), led to delistings and significant exits from the public market especially for small firms (KAMAR, KARACA-MANDIC, AND TALLEY [2007]), and increased incentives for small firms to remain small (GAO, WU, AND ZIMMERMAN [2008]).

Among the new rules, Section 404 – introduced by the Securities and Exchange Commission (SEC) in May 2003 – is widely regarded as the most onerous and costly regulation. The section requires companies to employ procedures to monitor and control the financial reporting process and to assess the effectiveness of such internal controls and procedures in an annual management report. Furthermore, Section 404 requires that an outside auditor attest to the assessment of the company's controls alongside the company's annual report.

Section 404 became binding for the majority of U.S. public companies (accelerated filers) from 2004 onwards. However, companies with a public float – equity that is not held by affiliates of the company – of less than \$75 million (nonaccelerated filers) were granted several exemptions from compliance. For these companies, the management's assessment of the internal control systems was not required before 2007, and the attestation by an outside auditor was not required before June 2010.

The size-dependent cutoff for mandatory compliance with Section 404 decreases the net benefits of taking over a nonaccelerated filer for a public U.S. company, if after the acquisition the public float of the combined venture exceeds the \$75 million threshold. In such cases, Section 404 becomes binding for the newly acquired entity, and the acquirer is faced with the associated costs.<sup>1</sup> Furthermore, uncertainty about the financial reporting mechanisms and internal controls of a nonaccelerated filer might necessitate a more thorough due diligence process prior to the acquisition and increase the effective takeover costs even more. For these reasons, we hypothesize that the size-dependent nature of Section 404 has made takeovers that would trigger mandatory compliance less attractive.

Extensive theoretical and empirical work, for example by MANNE [1965], JENSEN [1988], and SCHARFSTEIN [1988], supports the view that a well-functioning takeover

<sup>1</sup> Note that while nonaccelerated filers might have expected that they would eventually have to comply with Section 404 in the future, the mere postponement of the compliance costs has significant value. Assuming yearly compliance costs of \$0.7 million and a discount rate of 5%, a five-year postponement reduces the present value of all future compliance costs by about \$3 million – a substantial amount for small firms.

market can address governance problems. If Section 404 has made takeovers that would trigger mandatory compliance more costly, and if this effect outweighs the incentives to merge in order to benefit from potential economies of scale in the compliance costs associated with other provisions of SOX, then we expect the market for corporate control to have weakened. Therefore, an unintended effect of granting exemptions to small companies might have been a weakening of corporate governance.

Among the empirical literature on the effects of the Sarbanes–Oxley Act, our article is most closely related to the work of ENGEL, HAYES, AND WANG [2007], ILIEV [2010], GAO, WU, AND ZIMMERMAN [2008], and KAMAR, KARACA-MANDIC, AND TALLEY [2007]. ENGEL, HAYES, AND WANG [2007] and KAMAR, KARACA-MANDIC, AND TALLEY [2007] examine the effect of SOX on the going-private decisions of firms. They find that the propensity of small U.S. companies to exit the public market has increased since the passage of SOX, while there seems to be little effect on the going-private decisions of large firms. GAO, WU, AND ZIMMERMAN [2008] and ILIEV [2010] study the effects of SOX in general, and specifically on nonaccelerated filers. ILIEV [2010] documents that compliance with Section 404 imposed significant costs, led to more conservative reporting, and was associated with lower buy-and-hold returns of accelerated filers over the three-year period starting with the signing of SOX. He interprets his findings as evidence that compliance with Section 404 was indeed perceived as imposing net costs. GAO, WU, AND ZIMMERMAN [2008] examine the incentives for firms to stay below the \$75 million threshold and find that firms actively managed their public float to do so.

Our work adds to the existing strand of literature in that it explores the effects of postponing mandatory compliance with Section 404 on the takeover market for small public U.S. firms. In order to do so, we examine the merger activity involving U.S. firms with a public float of less than \$75 million (nonaccelerated filers: small firms) and U.S. firms with a public float in excess of \$75 million (accelerated filers: *large* firms) over the period from 2001 to 2007. We find that after the passage of Section 404 there was a decline both in the probability that a small public U.S. firm is taken over by a public U.S. acquirer and in the premiums paid in such transactions. We find no change in the probability that a small public U.S. firm is bought by any other type of acquirer, nor do we find a decrease in the premiums that are paid in such takeovers. Furthermore, we explore the effect of the decline of takeover activity on firms' leverage and cash holdings and find that small public U.S. firms decreased their leverage after the introduction of Section 404, whereas large ones increased their leverage and decreased their cash holdings.

The rest of the article is organized as follows. Section 2 gives a brief overview of the SOX legislation, and section 3 introduces a stylized model of the effects of compliance costs on corporate takeovers. Section 4 discusses our data, section 5 describes our empirical methodology and presents the results, and section 6 concludes.

## 2 *Review of the SOX Legislation*

The Sarbanes–Oxley Act was introduced in 2002 after a series of corporate scandals that involved accounting irregularities and share price manipulation. The most notorious of these scandals is perhaps the collapse of the energy company Enron. On November 8, 2001, Enron filed restated financial results with the Securities and Exchange Commission (SEC). The restatement was made after several weeks of SEC investigations, which revealed various accounting irregularities and showed that the company was more heavily indebted than its earlier statements had indicated. Finally, on December 2, 2001, Enron filed for bankruptcy protection, and similar accounting irregularities and cases of corporate misconduct in a number of firms, including Tyco and Worldcom, were identified by the SEC several months later.

Between December 2001 and April 2002, the Senate Committee on Banking, Housing, and Urban Affairs and the House Committee on Financial Services held numerous hearings concerning the collapse of Enron and related accounting and investor protection issues. These hearings and the corporate scandals that followed led to the passage of SOX. The Senate and the House reached consensus on the act on July 24 and voted almost unanimously for the act on July 25, 2002. President George W. Bush signed the bill into law on July 30, 2002.

Section 404 of the act was introduced by the SEC in May 2003, and initially, accelerated filers (firms with a public float greater than or equal to \$75 million) were expected to comply in the fiscal years ending on or after June 15, 2004. Nonaccelerated filers (firms with a public float smaller than \$75 million) were meant to comply in the fiscal years ending on or after April 15, 2005. However, public outcry led to the postponement of required compliance with Section 404. In February 2004, the compliance date for accelerated filers was extended to fiscal years ending on or after November 15, 2004, and the compliance date for nonaccelerated filers was pushed back to fiscal years ending on or after July 15, 2005. Further extensions of one year each were granted to nonaccelerated filers in March and September 2005. In August 2006, the compliance date for nonaccelerated filers was once more postponed to December 15, 2007, with the additional relief that an auditor's attestation would not be required before December 2008. Again, in June 2008, an additional extension was granted so that the auditor's attestation was not required before December 15, 2009. Later on, this deadline was again postponed to June 2010. The SEC release approving the extensions specifically stated that this would reduce the "cost of compliance" for small firms.

## 3 *A Simple Model of the Effects of Compliance Costs on Takeovers*

In this section, we argue that the well-meant extensions of the compliance dates described in the previous section might have had an unintended, negative effect on the market for corporate control for the exempted firms (small public U.S. firms.) In

order to do so we make use of a slightly modified version of the model of corporate takeovers introduced by GROSSMAN AND HART [1980] to show how both takeover probabilities and takeover premiums are affected by the costs of complying with a given regulation. First, we derive the probability of a takeover and the premium paid conditional on a takeover in a setting without any compliance costs as a benchmark case. Thereafter, we examine the effects of compliance costs on acquisitions that may trigger or remove the necessity to comply.

### 3.1 Benchmark Case: No Compliance Costs

Consider a firm that is owned by a large number of small shareholders,<sup>2</sup> which is currently valued at  $V_I > 0$ , and that would be valued at  $V_R \geq V_I$  in case of a successful takeover.<sup>3</sup> That is, assume that the value of the firm is higher in the hands of the raider than under the incumbent management, and define the total surplus that is created in the takeover as  $\Delta \equiv V_R - V_I$ . Furthermore, assume that in case of a successful takeover, the raider is able to capture an amount  $\phi(\Delta) \leq \Delta$  of the total surplus created,<sup>4</sup> such that the first derivative of  $\phi(\Delta)$  with respect to  $\Delta$  satisfies  $0 \leq \phi'(\Delta) \leq 1$ . That is, the raider can extract at most all of the surplus that is created, the amount the raider extracts is weakly increasing in the surplus, and for every additional dollar of surplus at most one additional dollar can be extracted. Finally, assume that the raider faces private costs  $c \geq 0$  from organizing the takeover, where  $c$  is a random variable with cumulative distribution function  $F_c$  and density function  $f_c$ .

It is a well-known result that in this setting, shareholders will tender their shares if the price  $p$  offered by the raider satisfies

$$p \geq V_R - \phi(\Delta) = V_I + \Delta - \phi(\Delta),$$

and a profit-maximizing raider offering the lowest price  $p^*$  that will lead to a successful takeover will make a total profit of

$$V_R - p^* - c = \phi(\Delta) - c.$$

Clearly, the raider will only bid for the target if  $\phi(\Delta) \geq c$ , and it follows immediately that the probability that the firm will be taken over is

$$\sigma(\Delta) \equiv \Pr(c \leq \phi(\Delta)) = F_c(\phi(\Delta)).$$

The premium paid by the raider in case of a takeover amounts to

$$\rho(\Delta) \equiv \frac{p^*}{V_I} - 1 = \frac{V_R - \phi(\Delta)}{V_I} - 1 = \frac{\Delta - \phi(\Delta)}{V_I}.$$

<sup>2</sup> Specifically, assume that each shareholder believes that her decision on whether or not to tender her shares in case of a bid by a raider does not change the probability that the takeover is successful.

<sup>3</sup> In our setting, a profit-maximizing raider would never bid for a firm if  $V_R < V_I$ .

<sup>4</sup>  $\phi(\Delta)$  might arise for example from a toehold in the target firm or from a provision in the target's corporate charters that allows the raider to exclude minority shareholders from a fraction of the increase in value.

Differentiating the probability of a takeover and the premium conditional on a takeover with respect to  $\Delta$  gives us

$$\sigma'(\Delta) = f_c(\phi(\Delta))\phi'(\Delta) \geq 0$$

and

$$\rho'(\Delta) = \frac{1 - \phi'(\Delta)}{V_I} \geq 0.$$

It can be seen that both the probability of a takeover and the premium conditional on a takeover weakly increase in the surplus  $\Delta$  created by the raider.

### 3.2 The Effect of Costly Compliance

Let us now examine how the probability that a firm is taken over and the premium paid in case of a takeover are affected by the introduction of some regulation with compliance costs  $k > 0$ . We assume that for  $i \in \{I, R\}$  we have  $V_i(k) < V_i$ , where  $V_i$  denotes the value of the firm in the absence of any compliance costs, and  $V_i(k)$  denotes the value of the firm in case it has to comply with the regulation. Furthermore, we assume that  $V_R(k) - V_I(k) = V_R - V_I = \Delta$ . That is, we assume that compliance is costly, and that the decrease in the firm's value due to the compliance costs does not depend on who owns the firm. Finally, let us assume that the need to comply may be triggered or removed by an acquisition, so that three cases can be distinguished: acquisitions that trigger compliance, acquisitions that remove the necessity to comply, and acquisitions that do not affect whether a firm needs to comply.

Clearly, if an acquisition triggers compliance, the surplus that is created by the raider is reduced, and vice versa, if an acquisition removes the necessity to comply, the surplus is larger than in the benchmark case. Thus, if a takeover triggers (removes) the need to comply with the regulation, both the probability of a takeover and the premium paid conditional on a takeover are weakly smaller (larger) than in the benchmark case. In case a takeover neither triggers nor removes the need to comply, the probability of a takeover is exactly as in the benchmark case. The takeover premium remains unchanged if the target does not have to comply either if owned by the raider or under its current management, and the premium weakly increases in case the firm must comply in both cases.<sup>5</sup>

Applied to the specific setting of exempting small public U.S. firms from compliance with Section 404, the model delivers four testable implications. First, the introduction of Section 404 should lead to a decline in the probability that a small public U.S. firm is taken over by a public U.S. acquirer as well as to a decline in the premiums paid in such acquisitions. Second, the probability that a large public U.S. firm is taken over by a public U.S. acquirer should remain unchanged. Third, for small public U.S. firms we expect no increase in the probability of being acquired by any *other* (i.e., not public U.S.) type of acquirer, nor in the takeover premiums

<sup>5</sup> Note that  $V_I(k) < V_I$ , so that  $(\Delta - \phi(\Delta))/V_I(k) > (\Delta - \phi(\Delta))/V_I$ .

of such acquisitions. Fourth, we expect to find an increase in the probability that a large public U.S. firm is bought by a nonpublic or non-U.S. (“other”) acquirer, as well as an increase in the premiums that these acquirers pay.

#### 4 Data

Our main source for acquisition data is the SDC Platinum database, from which we obtain all M&A transactions of public U.S. targets between 2001 and 2007. We include only completed acquisitions for which the announcement date, the target’s share price four weeks and one day prior to the announcement, and the price per share paid by the acquirer are known. Furthermore, we consider only transactions in which the acquirer has crossed the threshold of 50% ownership in the target,<sup>6</sup> exclude financial and public sector firms, and require that financial information for the target be available in the Compustat database for the fiscal year that precedes the announcement of the takeover. Finally, we require that the target be listed on one of the following six exchanges: NYSE, NASDAQ, American Stock Exchange, Chicago Stock Exchange, Pacific Stock Exchange, or Philadelphia Stock Exchange.

We then create a sample of all public U.S. firms in the Compustat database that are listed on one of the six stock exchanges we consider and that have a year-end market capitalization of less than \$500 million. As before, we exclude public sector and financial firms and merge the information on the M&A transactions with this sample. That is, if a firm in our sample is acquired in a given year, we match the acquisition information with the Compustat observation of the preceding year.<sup>7</sup>

Finally, we classify each firm in our sample in each year as either *small* or *large*. We classify firms as *small* if the public float of these firms is below \$75 million, and as *large* if the public float is above \$75 million. Clearly, all firms with a market capitalization of less than \$75 million are classified as small, since the public float cannot exceed the market capitalization. Further, we classify all firms with a market capitalization between \$300 million and \$500 million as large, since these firms are likely to have a public float that exceeds \$75 million.<sup>8</sup> For all firms with a market capitalization between \$75 million and \$300 million, we collect the firms’ public float from the 10K filings with the help of a web-crawling program and manually check the results.<sup>9</sup> Furthermore, for all takeover observations, we distinguish between acquisitions by public U.S. firms that are listed on one of the

<sup>6</sup> We drop observations if information on the percentage of shares acquired or the percentage of shares owned after the acquisition is not available.

<sup>7</sup> We match each target with Compustat information of the fiscal year that precedes the announcement of the takeover, because it is not guaranteed that a target files financial information in the year in which it is acquired.

<sup>8</sup> To ensure comparability between our two groups, we exclude firms that have a market capitalization that is greater than \$500 million from the sample.

<sup>9</sup> Observations for which public float information is missing are dropped from the sample.

six exchanges we consider and that are neither public sector nor financial firms (*public U.S. acquirers*) and takeovers by any other firms (*other acquirers*).

## 5 Results

### 5.1 Number of Firms and Takeovers

Table 1 presents the numbers of small and large public U.S. firms in our sample, the number of acquisitions, and the percentage of acquired firms. The sample period is 2001 to 2007 (based on the year in which the acquisitions were announced). In Panel A, only public U.S. acquirers are taken into account. Panel B shows the results for all other types of acquirers (non-U.S., nonpublic). On average we observe 777 large firms and 958 small firms, of which 5.10% and 5.48% are a takeover target in a given year, respectively. For large firms, the average probability of being acquired by a public U.S. acquirer (by an “other acquirer”) is 2.16% (2.94%), and for small public U.S. firms it is 2.18% (3.29%).

### 5.2 Effect of Section 404 on Takeover Probabilities

In order to examine whether the passage of Section 404 has had a detrimental effect on the takeover activity involving nonaccelerated public U.S. firms, we estimate

*Table 1*  
Number of Firms and Takeovers

Year	Small firms	Targets	%	Large firms	Targets	%
<i>Panel A: Acquisitions of Public U.S. Firms by Public U.S. Acquirers</i>						
2001	1,176	35	2.98%	652	14	2.15%
2002	1,142	20	1.75%	638	14	2.19%
2003	1,204	34	2.82%	824	16	1.94%
2004	1,026	25	2.44%	782	15	1.92%
2005	823	15	1.82%	814	18	2.21%
2006	699	11	1.57%	877	21	2.39%
2007	634	12	1.89%	854	20	2.34%
<i>Panel B: Acquisitions of Public U.S. Firms by Other Acquirers</i>						
2001	1,176	53	4.51%	652	18	2.76%
2002	1,142	21	1.84%	638	9	1.41%
2003	1,204	43	3.57%	824	10	1.21%
2004	1,026	19	1.85%	782	21	2.69%
2005	823	27	3.28%	814	34	4.18%
2006	699	24	3.43%	877	37	4.22%
2007	634	29	4.57%	854	35	4.10%

linear probability models of the form

$$Acquired = \alpha + \beta_1 \cdot S404 \cdot Small + \beta_2 \cdot S404 + \beta_3 \cdot Small + \gamma' X + \varepsilon.$$

The unit of observation for these estimations is a firm–year combination. For a given observation, *Acquired* is a dummy variable that takes the value 1 if an acquisition of the firm is announced in that year, and 0 otherwise. *S404* is a dummy that takes the value 1 for all years after 2003, *Small* is a dummy that takes the value 1 for small firms, and *X* is a set of firm-level control variables, industry dummies, and year dummies.<sup>10</sup> The control variables are the natural logarithm of the firm's market capitalization, the firm's market-to-book ratio (sum of market capitalization and total long-term debt divided by book value of total assets), EBIT divided by total assets, CAPEX divided by total assets, and the firm's leverage (total long-term debt divided by total assets). Industry fixed effects are formed at the level of the first two digits of the firms' SIC codes. To allow for heterogeneity and correlation of the error terms across observations within a given industry, we calculate heterogeneity-robust standard errors that allow for clustering at the industry level.

Table 2 presents the results of these estimations. In Panel A, we take only acquisitions by public U.S. acquirers into account, and in Panel B, we only consider acquisitions by other acquirers. Furthermore, we run separate regressions for small public U.S. firms (column 1) and for large public U.S. firms (column 2) as well as pooled regressions for all public U.S. firms (columns 3 and 4). In all regressions, we include the full set of firm-level control variables and industry dummies, whereas the year fixed effects are only included in the pooled regressions which are reported in column 4.

In the regressions reported in columns 1 and 2, we essentially compare the probabilities of being a takeover target, conditional on covariates, before and after the introduction of Section 404 for small and for large public U.S. firms, while distinguishing between different types of acquirers. Consistent with the predictions of the model introduced in section 3, we find that the coefficient estimate for the *S404* dummy is negative and significant in the regression estimating the effect of Section 404 on the probability that a small public U.S. firm is acquired by a public U.S. acquirer (Panel A, column 1). In addition, we find that for large public U.S. firms the probability of being acquired by a public U.S. firm was unaffected by Section 404 (Panel A, column 2).

We next estimate the effect of Section 404 on the probability of being taken over by any other type of acquirer (Panel B). This can essentially be interpreted as a placebo test, as for small public U.S. firms there should not be any effect of Section 404 on the probability of these acquisitions. Consistent with this prediction, we find that Section 404 has had no effect on the probability that a small firm is bought by acquirers other than public U.S. firms. In addition, we find that the estimated effect

<sup>10</sup> In the regressions that include year fixed effects, we drop the *S404* dummy, as it is perfectly explained by a linear combination of the year dummies.

*Table 2*  
Effect on Takeover Probabilities

	Small firms	Large firms	All firms	All firms
Controls	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes
Year FE	no	no	no	yes
Observations	6,633	5,382	12,015	12,015
<i>Panel A: Acquisitions of Public U.S. Firms by Public U.S. Acquirers</i>				
<i>S404 · Small</i>	—	—	-0.007* (0.004)	-0.008* (0.005)
<i>S404</i>	-0.006* (0.003)	0.001 (0.003)	0.001 (0.003)	—
<i>Small</i>	—	—	0.012* (0.007)	0.013* (0.007)
<i>R-squared</i>	0.015	0.008	0.009	0.010
<i>Panel B: Acquisitions of Public U.S. Firms by Other Acquirers</i>				
<i>S404 · Small</i>	—	—	-0.019* (0.011)	-0.018 (0.011)
<i>S404</i>	0.002 (0.007)	0.022*** (0.006)	0.022*** (0.006)	—
<i>Small</i>	—	—	0.014*** (0.005)	0.015*** (0.005)
<i>R-squared</i>	0.016	0.021	0.014	0.017

*Notes:* The sample period is 2001 to 2007. *S404* is a dummy that takes the value 1 for all years after 2003. *Small* is a dummy that takes the value 1 for small firms. Controls are *ln(mkt.cap.)*, *MtB*, *EBIT/assets*, and *CAPEX/assets*. Industry fixed effects (Industry FE) are formed at the level of the first two digits of the SIC code. Standard errors (in parentheses) are clustered at the industry level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level.

of Section 404 on the probability that a large public U.S. firm is acquired by such other acquirers is positive and significant.<sup>11</sup>

Finally, columns 3 and 4 display the estimation results for the regressions in which we include both small and large public U.S. firms. The coefficient of interest in these regressions is the coefficient on the interaction term between the *S404* dummy and the *Small* dummy (*S404 · Small*), as it estimates the effect of Section 404 on the probability of being acquired for small firms by comparing the changes

<sup>11</sup> This finding is consistent with existing evidence that some firms chose to go private after the passage of SOX in order to avoid the associated compliance costs.

in the acquisition probabilities for small and large firms from before the year 2003 to after the year 2003.<sup>12</sup> As is to be expected, the estimation results of columns 3 and 4 confirm our previous findings. Relative to the probability for large public U.S. firms, the probability of being bought by a public U.S. acquirer has decreased for small public U.S. firms after the introduction of Section 404 (Panel A). This is consistent with our hypothesis that the costs of compliance that would be triggered in case of an acquisition have indeed deterred some potential public acquirers from taking over a small public U.S. firm. In a similar fashion, the results presented in Panel B reflect the earlier finding that the probability of being acquired by a nonpublic or non-U.S. firm has increased for large public U.S. firms but remained unchanged for small firms.

In summary, the estimation results presented in Table 2 provide some evidence that the introduction of Section 404 – and more specifically the exemption of small firms from compliance – might indeed have had a detrimental effect on the takeover market for small public U.S. firms. Consistent with the predictions of our model, we find evidence for a decrease in the probability that a small firm is acquired by a public U.S. acquirer and for an increase in the probability that a large firm is acquired by any other type of acquirer. At the same time, we find no evidence for an effect of Section 404 on the probability that a small (large) firm is being acquired by “other” (by public U.S.) acquirers.

While at first glance the magnitude of the estimated effect appears to be small – around half a percentage point for the effect of Section 404 on the probability that a small firm is acquired by a public U.S. firm – note that the unconditional probabilities of being acquired are very small as well. Only about 2.5% of all small public firms in our sample were acquired by another public U.S. firm in a given year before Section 404 was introduced, and the probability of being taken over by any type of acquirer was only 5.8%. Thus, a reduction of half a percentage point, while seemingly small in absolute terms, is in fact a significant reduction when seen in the light of the unconditional takeover probabilities.

### 5.3 *Effect of Section 404 on Takeover Premiums*

We continue our analysis by examining the effect of Section 404 on the premiums paid in takeovers of public U.S. targets. As before, we consider the effect on takeover premiums for small and large public targets, both separately and relative to each other, and distinguish between public U.S. acquirers and all other types of acquirers. In order to study the impact of Section 404 we estimate models of the form

$$\text{Premium} = \alpha + \beta_1 \cdot S404 \cdot Small + \beta_2 \cdot S404 + \beta_3 \cdot Small + \gamma' X + \varepsilon,$$

<sup>12</sup> Note that the estimated coefficients on the interaction term in columns 3 and 4 are almost identical within each of the two panels. In combination with the fact that the only difference between the two columns is the inclusion of year dummies, we can infer that the results are not driven by any omitted macro variables such as GDP growth or other economic indicators that vary from year to year.

where *Premium* is the natural logarithm of the quotient of the price per share paid by the acquirer and the target's share price four weeks before the takeover announcement.<sup>13</sup> *S404* and *Small* are dummy variables for the years after 2003 and for small firms, as before, and *X* is a set of control variables, industry dummies, and year dummies.<sup>14</sup> The control variables are the percentage of target shares owned by the acquirer before the acquisition (toehold), the natural logarithm of the quotient of the target's share price one day prior to the announcement and the share price four weeks prior to the announcement (*runup*), a dummy that equals 1 if the target and the acquirer share the same primary SIC code, the target's market-to-book ratio (sum of market capitalization and total long-term debt divided by the book value of total assets), the target's CAPEX divided by the book value of total assets, and the target's cash holdings divided by the book value of total assets. Industry fixed effects are formed at the level of the first two digits of the firms' SIC codes. Furthermore, to allow for heterogeneity and correlation of the error terms across observations within a given industry, we calculate heterogeneity-robust standard errors that allow for clustering at the industry level in all specifications.

Table 3 presents the results of these regressions. As for the analyses regarding the effect of Section 404 on the probability of being a takeover target, we run separate regressions for small and for large public U.S. targets only (columns 1 and 2) as well as pooled regressions for all targets (columns 3 and 4), and we distinguish between acquisitions by public U.S. acquirers (Panel A) and other acquirers (Panel B). The estimation results displayed in columns 1 and 2 are consistent with the predictions of the model introduced in section 3. The significant and negative point estimate for the coefficient on the *S404* dummy in column 1, Panel A, suggests that for small targets there has indeed been a decline in the premiums paid by public U.S. acquirers. In contrast, we do not find evidence for a decline in the premiums paid for large targets. Shifting focus to the premiums paid in acquisitions by other acquirers (Panel B), we cannot reject the hypothesis that Section 404 has had no effect on the premiums for both small and large public U.S. targets. Columns 3 and 4, which display the results for the regressions that take all targets into account, confirm these findings – the estimated coefficient on the interaction term between the *S404* and the *Small* dummy is negative and significant in the regressions for acquisitions by public U.S. acquirers (Panel A). The point estimate of -0.060 translates into a reduction of about \$5 million – from \$86 million to \$81 million – in the average price paid by a public U.S. acquirer for a small public U.S. target with a market capitalization of \$60 million (the average size of a small target in our sample). Given that the model of section 3 suggests that the reduction in value due to the costs of compliance is shared by the raider and the target shareholders, these findings imply a lower bound for the costs of compliance of about \$5 million.<sup>15</sup>

<sup>13</sup> To remove the effect of outliers, we winsorize all premiums at the 10% level.

<sup>14</sup> In the regressions that include year fixed effects, we drop the *S404* dummy, as it is perfectly explained by a linear combination of the year dummies.

<sup>15</sup> One caveat of this analysis is that it abstracts from potential reductions in the competition for targets. While such a reduction may be driven by the compliance costs

*Table 3*  
Effect on Takeover Premiums

	Small targets	Large targets	All targets	All targets
Controls	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes
Year FE	no	no	no	yes
<i>Panel A: Acquisitions of Public U.S. Firms by Public U.S. Acquirers</i>				
S404 · Small	—	—	−0.063* (0.036)	−0.060* (0.035)
S404	−0.078** (0.032)	−0.015 (0.031)	−0.001 (0.030)	—
<i>Small</i>	—	—	0.070** (0.028)	0.072** (0.028)
R-squared	0.403	0.425	0.371	0.379
Observations	148	114	262	262
<i>Panel B: Acquisitions of Public U.S. Firms by Other Acquirers</i>				
S404 · Small	—	—	0.038 (0.044)	0.037 (0.039)
S404	−0.008 (0.029)	−0.041 (0.048)	−0.054 (0.036)	—
<i>Small</i>	—	—	0.018 (0.032)	0.022 (0.024)
R-squared	0.382	0.503	0.393	0.407
Observations	211	159	370	370

*Notes:* The sample period is 2001 to 2007. All premiums have been winsorized at the 10% level. S404 is a dummy that takes the value 1 for all years after 2003. *Small* is a dummy that takes the value 1 for small firms. Controls are the toehold of the acquirer, the runup in the target's shareprice, a dummy for acquisitions within the same industry, the target's MtB ratio, CAPEX/assets, and cash/assets. Industry fixed effects are formed at the level of the first two digits of the SIC code. Standard errors (in parentheses) are clustered at the industry level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level.

#### 5.4 Effects of Section 404 on Leverage and Cash Holdings

At last, we set out to investigate whether the passage of Section 404 has had an effect on the leverage and cash holdings of small public U.S. firms. We hypothesize that

and entail a decline in premiums, the total reduction in premiums would reflect both the direct effect of the compliance costs and the indirect effect through a reduction of competition.

*Table 4*  
Effect on Leverage and Cash Holdings

	Small firms	Large firms	All firms	All firms
Firm FE	yes	yes	yes	yes
Year FE	no	no	no	yes
<i>Panel A: Effect on Leverage</i>				
<i>S404 · Small</i>	—	—	−0.035*** (0.010)	−0.034*** (0.010)
<i>S404</i>	−0.023*** (0.008)	0.015* (0.008)	0.013* (0.007)	—
<i>Small</i>	—	—	0.040*** (0.007)	0.040*** (0.007)
<i>R-squared</i>	0.721	0.855	0.756	0.756
Observations	6,020	5,206	11,226	11,226
<i>Panel B: Effect on Cash Holdings</i>				
<i>S404 · Small</i>	—	—	0.031*** (0.007)	0.028*** (0.008)
<i>S404</i>	0.003 (0.006)	−0.030*** (0.006)	−0.029*** (0.006)	—
<i>Small</i>	—	—	−0.008 (0.007)	−0.006 (0.008)
<i>R-squared</i>	0.779	0.801	0.756	0.757
Observations	5,999	5,198	11,197	11,197

*Notes:* The sample period is 2001 to 2007. *S404* is a dummy that takes the value 1 for all years after 2003. *Small* is a dummy that takes the value 1 for small firms. *Leverage* is a firm's total long-term debt divided by its total assets. *Cash Holdings* is the firm's cash holdings divided by its total assets. Standard errors (in parentheses) are clustered at the firm level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level.

as the threat of a takeover goes down, firms might choose lower levels of leverage and hold more cash. In order to further investigate these hypotheses, we estimate regressions of the form

$$Y = \alpha + \beta_1 \cdot S404 \cdot Small + \beta_2 \cdot Small + \text{Firm FE} + \text{Year FE} + \varepsilon.$$

As before, we estimate separate regressions for small and for large firms (columns 1 and 2, respectively) as well as regressions for both types of firms (columns 3 and 4),

and we calculate heterogeneity-robust standard errors that allow for clustering at the firm level in all specifications.<sup>16</sup>

Table 4 presents the results for the effect on leverage (long-term debt divided by total assets) in Panel A, and the effect on cash holdings (cash divided by total assets) in Panel B. The estimates for the coefficient on the *S404* dummy in columns 1 and 2 as well as on the interaction term between the *S404* and the *Small* dummy in columns 3 and 4 suggest that small public firms have indeed reduced their leverage after the introduction of Section 404, whereas large firms have increased their leverage. This finding is consistent with the hypothesis that a reduction in the takeover threat might allow managers to choose lower levels of leverage (ZWIEBEL [1996], GARVEY AND HANKA [1999]). With respect to the effect on cash holdings, the estimation results suggest that large firms hold less cash (relative to their assets) after the introduction of Section 404, whereas the hypothesis that Section 404 has had no effect on the cash holdings of small firms cannot be rejected.

## 6 Conclusion

In this paper, we have documented an unintended effect of Section 404 of the Sarbanes–Oxley Act: a weakening of the market for corporate control for small public U.S. firms. Exempting nonaccelerated filers from compliance with Section 404 has made takeovers of such firms relatively more expensive for public U.S. firms, as the acquirer inherits the responsibility for costly compliance if the public float of the merged companies exceeds the threshold of \$75 million. This in turn has led to a decrease in the takeover threat stemming from public U.S. acquirers faced by small companies after the legislation was passed and has become manifested in a decline of the takeover activity involving small public U.S. companies. To the extent that a well-functioning takeover market helps to alleviate governance problems by imposing a removal threat on managers, this reduction in takeover activity implies that exempting small firms from compliance has had an unintended, negative effect on the corporate governance of these firms.

Furthermore, we have provided evidence that the passage of Section 404 has not only reduced the takeover threat faced by small public U.S. firms, but has also had a negative effect on the premiums paid in the acquisitions of such firms. Finally, our results suggest that the reduced takeover threat might have allowed the managers of small firms to choose lower levels of leverage.

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