Acquirer Internal Control Weaknesses in the Market for Corporate Control*

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ABSTRACT

This paper examines how disclosures regarding internal controls, required by sections 302 and 404 of the Sarbanes-Oxley Act of 2002 (SOX), affect the market for corporate control. We hypothesize that acquirers with internal control weaknesses (ICWs) make suboptimal acquisition decisions based on poor-quality information generated by their ineffective controls over financial reporting. We expect that such acquirers will be more likely to misestimate the value of their targets or the potential synergies from mergers, thereby overpaying for completed deals. Using a treatment sample of acquisitions made by acquirers that have disclosed ICWs and two matched control samples without ICW disclosures, we document that ICW acquirers experience a substantially more negative market response to acquisition announcements and have lower future performance than the two matched control samples without ICW disclosures. Overall, our results suggest that ineffective internal controls hinder decision making related to mergers and acquisitions (M&A).

Déficiences du contrôle interne de l'acquéreur sur le marché de la prise de contrôle

RÉSUMÉ

Les auteurs se demandent comment l'information relative au contrôle interne dont font état les sociétés, conformément aux articles 302 et 404 de la loi Sarbanes-Oxley de 2002 (SOX), influe sur le marché de la prise de contrôle. Ils posent l'hypothèse selon laquelle les acquéreurs dont le contrôle interne présente des déficiences prennent des décisions non optimales en matière d'acquisition en se fondant sur des données dont la qualité laisse à désirer en raison de l'inefficacité des contrôles exercés sur l'information financière. Les auteurs s'attendent à ce que ces acquéreurs soient davantage susceptibles d'errer dans l'estimation de la valeur de leurs cibles ou de celle des effets de synergie potentiels découlant des fusions envisagées, et à ce que le prix auquel ils concluent leurs marchés soit donc supérieur à la valeur

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de la société acquise. À l'aide d'un échantillon de traitement regroupant des acquisitions réalisées par des sociétés qui font état de déficiences de leur contrôle interne et de deux échantillons de contrôle appariés constitués d'acquisitions de sociétés qui ne font pas état de déficiences de leur contrôle interne, les auteurs démontrent que les acquéreurs qui font état de déficiences de leur contrôle interne enregistrent une réaction du marché sensiblement plus négative aux annonces d'acquisition et affichent une performance ultérieure plus faible que les acquéreurs des deux échantillons de contrôle appariés constitués de sociétés qui ne font pas état de déficiences de leur contrôle interne. Dans l'ensemble, les résultats de l'étude semblent indiquer que l'inefficacité des contrôles internes nuit à la prise de décisions en matière de fusions et d'acquisitions.

1. Introduction

The U.S. Congress enacted the Sarbanes-Oxley Act (SOX) in 2002 in the aftermath of a series of corporate scandals. The Act aims to strengthen investor protection by promoting better corporate governance and auditor independence. Among its most controversial features are the requirements governing internal controls under sections 302 and 404. In particular, section 404 requires top management to assess the effectiveness of internal controls over financial reporting, and an external auditor to attest to the validity of management assessment. Firms with ineffective internal controls must disclose the existence and nature of their internal control weaknesses (ICWs). Extensive research has identified the costs and benefits of SOX and found that ICW disclosures are associated with earnings quality, future restatements, and cost of debt or equity (e.g., Ashbaugh-Skaife et al. 2008, 2009; Doyle et al. 2007a). Studies also document that managers of firms with ICWs under- or overinvest (Cheng et al. 2013), forecast less accurately (Feng et al. 2009), and manage inventory poorly (Feng et al. 2015). These findings suggest that these managers stumble in part because they base their decisions on faulty or insufficient information generated by ineffective controls.

Far less attention has been devoted to examining the impact of SOX on managerial decisions in the context of mergers and acquisitions (M&As). M&As are among the largest and most visible investments made by firms, and represent a substantial proportion of economic activity, totaling over $1 trillion a year with deal values ranging from 5 percent to 10 percent of U.S. GDP in recent years (McCracken 2009). In this paper, we ask whether acquirers that have disclosed ICWs (hereafter, ICW acquirers) appear to make suboptimal acquisitions. To address our research question, we compare ICW acquirers (the treatment sample) with control samples consisting of acquirers that have not disclosed ICWs (hereafter, non-ICW acquirers) with respect to premiums paid, announcement returns, and the future performance of combined companies. To control for the determinants of internal control weaknesses, we conduct all our tests using our treatment sample and two control samples that are matched by (i) propensity scores based upon the characteristics associated with ICW disclosures; and (ii) industry, year, and M&A deal value.[1] Our sample is obtained from Securities Data Corporation (SDC) Mergers and Acquisitions database and includes M&As that were announced from 2003 to 2014, after the enactment of SOX. We identify acquirers that have reported one or more material weaknesses in the most recent 10-Q (section 302) or 10-K (section 404) reports before the acquisition announcements. Our final treatment sample consists of 381 acquisitions announced by ICW acquirers that acquired targets without ICW disclosures. In addition, there are 4,356 deals that do not involve ICW disclosures by either the acquirer or the target. We use these deals to form our two matched-control samples.

We begin our analysis by examining the premiums paid to targets' shareholders. We find evidence that ICW acquirers pay larger premiums to their targets than non-ICW

1. We discuss how we form these control samples when we present our research design (section 3 and Appendix 1).

acquirers in one control sample—acquirers that are matched by industry, year, and deal value. These acquirers are likely to have effective internal controls. After controlling for a host of firm and deal-specific characteristics, we find that ICW acquirers pay a significantly higher premium than these matched acquirers. We estimate that ICW acquirers, on average, pay $46.6 million more in premiums than these non-ICW acquirers. Given that the unconditional mean of the premiums paid by non-ICW acquirers is $778 million, this represents an economically meaningful increase of approximately 6 percent. By contrast, acquirers that have similar propensity scores as the ICW acquirers appear to pay just as much premium as ICW acquirers. We find no statistical difference in premiums paid by the two samples after controlling for deal and firm characteristics. We also repeat the above analysis using accounting-based, instead of stock-based, premium valuation (De Franco et al. 2011) and report similar findings. This result suggests that firms that have similar propensities to disclose ICWs (even though they have not disclosed them) are also likely to pay larger premiums, either because they also maintain ineffective internal controls but fail to discover or disclose these weaknesses, or because the characteristics themselves lead to higher premiums. While these characteristics are those that are associated with ICW disclosures, they may not cause internal control weaknesses. We explore this further in our subsequent analyses.

Second, we examine the acquirers' stock returns around the announcement dates of acquisitions and find that, on average, the market reacts differently to the announcements of mergers by ICW acquirers. These acquirers experience substantially more negative announcement-period cumulative abnormal returns than do non-ICW acquirers, even after controlling for the differences in the premium and a host of additional variables known to affect announcement returns as well as ICWs. Overall, these results are consistent with the notion that the market is skeptical of ICW acquirers. Our findings support the view that investors suspect that they overbid, perhaps because they overestimate the value of the targets, or the synergies from acquisitions due to poor-quality information generated by their ineffective internal controls.

Third, to further understand whether the disclosure or the propensity drives the above-mentioned results, we examine the future performance of M&As by estimating the two-year buy-and-hold abnormal returns and returns on net operating assets. Our multivariate analysis finds that the future returns of ICW acquirers are lower than those of matched acquirers, suggesting that announcement returns did not fully impound possible future negative performance. Lower returns on net operating assets suggest that ICW acquirers perform poorly after M&As compared to non-ICW control samples. Overall, our evidence is consistent with ICW acquirers suffering from poor accounting information quality and subsequently making poor M&A decisions.

As part of additional analyses, we examine whether acquirers reporting that they have remediated ICWs in the fiscal year or quarter prior to the deal announcements behave similarly to acquirers with effective internal controls. Our results show that they pay lower premiums than ICW and propensity score matched acquirers but do not pay significantly different premiums from acquirers matched on industry, year, and deal value. When firms assert that they have remediated ICWs, the market responds similarly to their acquisition announcements to those of acquirers matched on industry, year, and deal value. Future performance of these firms corroborates the analyses on premium and announcement returns. Their performance is not different from that of non-ICW acquirers that are matched by industry, year, and deal value. These results underscore the importance of internal controls disclosures.

We make several contributions. We add to the literature that examines the impact of ineffective internal controls on managerial decisions. Prior evidence suggests that managers of firms with ICWs are likely to make suboptimal investment decisions. We provide evidence that ICW acquirers tend to pay larger premiums than non-ICW acquirers matched

by industry, year, and deal value, while acquirers that are matched by propensity scores pay just as much as ICW acquirers. We also document that the market reacts more negatively to the merger announcements of ICW acquirers even after controlling for the larger premiums. Furthermore, we document that the disclosure of ICWs matters in determining M&A profitability, as measured by the cumulative abnormal returns around the announcement dates and firm future performance. Finally, we contribute to the debate over the costs and benefits of SOX 302 and 404 (e.g., Coates and Srinivasan 2014; Iliev 2010). Although we cannot estimate the overall benefits and costs of the law, we document that a lack of effective internal control systems manifests in larger premiums paid to targets. While maintenance of effective internal controls is costly, not having them brings significant costs for acquirers, in the form of a higher premium and a lower cumulative abnormal return. This finding points to a benefit of maintaining effective internal controls in the market for corporate control that has not been documented in prior research.

The remainder of the paper proceeds as follows. In the next section, we review the literature and present our hypotheses. We then specify our research design in section 3. In section 4, we describe the data and descriptive statistics. In section 5, we report empirical results, and we conclude in the last section.

2. Literature review and hypothesis development

Literature review

The importance of internal controls has long been recognized in the American legal framework. The Foreign Corrupt Practices Act of 1977, better known for its anti-bribery provisions, requires that all Securities and Exchange Commission (SEC)-registrant firms (irrespective of foreign business) keep good books and records and establish and maintain appropriate internal controls. However, pre-SOX regulation required firms to report internal control weaknesses only when changing auditors (Geiger and Taylor 2003; Hammersley et al. 2008), although some firms voluntarily disclosed internal control assertions (McMullen et al. 1996). SOX expanded disclosure by requiring CEOs and CFOs to (i) personally certify quarterly that material weaknesses have been disclosed to the audit committee, to the auditor, and to the public (section 302); and (ii) annually document, test, and conclude on the efficacy of internal controls. Auditors in turn attest to this assertion (section 404).[2] Different forms of weaknesses (or deficiencies) are identified by companies, and some firms disclose as many as 11 in the same year. Doyle et al. (2007b, 195) find that firms that report material weaknesses tend to be "smaller, younger, financially weaker, more complex, growing rapidly, and/or undergoing restructuring." Overall, research on SOX 404 finds that the costs of the law are substantial and fall disproportionately on smaller firms; it is not clear whether documented benefits outweigh the costs.[3]

Ashbaugh-Skaife et al. (2008) suggest that the financial information provided by firms with weak internal controls is likely to be noisier and less reliable. Other research provides empirical evidence that ineffective internal controls hinder efficient operation. For example, firms with weak controls provide less accurate management forecasts (Feng et al. 2009), under- or overinvest (Cheng et al. 2013), and manage inventory poorly (Feng et al. 2015).[4] However, far less attention has been paid to the impact of internal control

2. See Ge and McVay (2005) for a summary of the legislation and Coates (2007) for a general discussion of SOX.
3. See Coates and Srinivasan (2014) for a literature review.
4. Other studies show that firms with lower financial reporting quality make suboptimal investment decisions. For example, McNichols and Stubben (2008) examine firms that manipulate their reported financial results (i.e., those that are investigated by the SEC, sued by investors, or restate their financial reports) tend to overinvest. Biddle et al. (2009) show that firms with poor accrual quality over- or underinvest.

effectiveness on M&As. In this study, we focus, in particular, on acquirers that have disclosed internal control weaknesses under sections 302 and 404.[5]

Hypotheses

Prior research (e.g., Offenberg and Pirinsky 2015) has found that premiums paid for U.S. public acquisitions range from an average of 44 percent for mergers to 58 percent for tender offers. Clearly, to entice a target's board and shareholders to sell their shares, the acquirer must pay a premium over market price. Prior research has found that the premium depends on variables such as the acquirer's size, the target's inherent value, the potential synergies, and managerial ownership (Palia 1993).

We begin by examining the link between bid premium and ICWs. Premiums reflect the negotiated price and capture the acquirer's (and the target's) valuation of the target and the potential synergies from the acquisition. Since ICW acquirers likely base decisions on faulty or insufficient information, which has been shown to result in less efficient investment (Biddle et al. 2009; Cheng et al. 2013; Garcia Lara et al. 2016), they are likely to misestimate the value of the targets and the synergies from the acquisition. While these firms should be just as likely to under- or overestimate their bids, when a bid is too low, it is unlikely to be accepted. We would therefore expect to observe only acquisitions with adequate or excessive premiums (i.e., the winner's curse). Thus, our first hypothesis is stated as follows:

Hypothesis 1. *ICW acquirers pay larger premiums than non-ICW acquirers.*

Our second hypothesis compares the announcement returns of ICW and non-ICW acquirers. Announcement returns represent the market's assessment of potential synergies minus the premium paid for the target (Fuller et al. 2002). Having observed ICW disclosures, the market might take ineffective internal controls into account and react with skepticism to acquisition announcements made by ICW acquirers. There are two possible reasons why the market reacts more negatively to acquisition announcements made by ICW acquirers. First, ICW disclosures may signal that ICW acquirers are likely to overpay for the targets by making suboptimal investment decisions due to internal information problems, weak monitoring, or both. Second, the market could be skeptical of the ability of management to integrate the combined companies to unlock any potential synergies. Thus, the second hypothesis is stated as follows:

Hypothesis 2. *The announcement returns of ICW acquirers are lower than those of non-ICW acquirers.*

While announcement returns reflect investors' initial assessment of the success of M&As, we also look at the actual performance of the deals. If ICW acquirers make suboptimal acquisition decisions based on poor information, overestimate potential synergies, or are unable to unlock the synergies, we would expect that combined companies are less likely to create value for shareholders. In our third hypothesis, we ask whether the future performance of acquirers varies with their ICW status. Our hypothesis is stated as follows:

5. A number of studies examine the relation between the financial information quality of *targets* and acquisition profitability, takeover premium, method of payments, and the likelihood of deal termination. See, for example, Raman et al. (2013), Skaife and Wangerin (2013), Marquardt and Zur (2015), and McNichols and Stubben (2015).

HYPOTHESIS 3. *The future performance of ICW acquirers is lower than that of non-ICW acquirers.*

3. Research design

Our hypothesis testing is based on two approaches: (1) univariate comparisons, and (2) multivariate regression analyses, both using two matched-pair samples.[6] We conduct all our tests using our treatment sample and two control samples that are matched by (i) propensity scores to disclose ICWs (the PS-matched control sample); and (ii) industry, year, and deal value (the IYV-matched control sample).

The first control sample consists of acquirers that have not disclosed ICWs but are matched by the characteristics associated with ICW disclosures based on prior literature (see Appendix 1 for detailed information).[7] By matching on the observable determinants of ICWs, we form a control sample that consists of acquirers that might also maintain ineffective internal controls, but fail to discover or disclose these weaknesses.[8] Of course, even though these PS-matched acquirers have similar observable determinants of ICWs, they may be free of ICWs. The second control sample consists of non-ICW acquirers that are matched by industry, year, and M&A deal values. Because they have not disclosed ICWs and do not share the same characteristics as ICW acquirers, they are less likely to have ICWs.[7] Therefore, to examine the impact of ICWs on premiums, announcement returns, and future performance of M&As, we focus on the difference between this sample and the treatment sample.

In the univariate analysis, we compare the premiums (*Premium*), announcement returns (*CAR*), and future performance (*LT Performance*) of our ICW sample with the two matched-control samples. To further account for the forces that may affect the premiums, announcement returns, and future performance—but are not controlled for in the matching process—we follow the M&A literature and include a host of control variables. Thus,

$$Premium = \gamma_0 + \gamma_1 Acq\_ICW + \sum \lambda_k Control + \varepsilon_1, \quad (1)$$

$$CAR = \alpha_0 + \alpha_1 Acq\_ICW + \alpha_2 Premium + \alpha_3 Acq\_ICW \times Premium + \sum \beta_j Control + \varepsilon_2, \quad (2)$$

$$LT\,Performance = \delta_0 + \delta_1 Acq\_ICW + \sum \delta_j Control + \varepsilon_3, \quad (3)$$

where *Premium* is calculated as the offer price divided by the target stock price 42 days before the announcement (Schwert 1996; Officer 2003; Betton et al. 2009). We also use an accounting-based premium as a robustness check, which is calculated as sales or EBITDA divided by deal value (De Franco et al. 2011). *CAR* in equation (2) is the cumulative

6. In our main multivariate analysis, we use an OLS regression that includes matched-pair fixed effects. As a robustness test (untabulated), we also use the pairwise differences as the dependent variables (*CAR* or *Premium*), which are regressed on the pairwise differences of the independent variables (Rubin 1973; Imbens 2004; Cram et al. 2009). The intercept of this pairwise differences model is interpreted as the average difference resulting from the ICW disclosure treatment effects. The results are robust to alternative methodologies.

7. To evaluate the efficacy of our matching procedure, we examine the difference in the propensity scores of our treatment and control samples. In Appendix 1, we show that the mean (median) propensity scores of the treatment and PS-matched control samples are not significantly different (panel B), while the mean (median) propensity score of the treatment sample is significantly higher than that of the IYV-matched control sample (panel C).

8. It is possible that some firms within our PS-matched control sample have unreported material weaknesses, although we remove the observations identified by Rice et al. (2015) that subsequently restated their financial statements.

market-adjusted return over the 2 days spanning the deal announcement. *LT Performance* is measured either as the 2-year buy-and-hold abnormal return (*BHAR*) or return on net operating assets (*RNOA*). The variable of interest in our three models is *Acq_ICW*, an indicator variable that takes the value of one if the acquirer disclosed ICWs in the last fiscal year or quarter before the deal announcement and zero otherwise. We also use the number of ICWs as an alternative variable to proxy for ineffective internal controls. Our control variables are clustered into four groups concerning acquirers and targets as follows: (i) deal characteristics; (ii) acquirer ICW control variables; (iii) acquirer characteristics; and (iv) target characteristics. All the variables are used as controls in our analyses of *Premium* (equation 1) and *CAR* (equation 2). In estimating equation (2), we also include *Premium* and *Acq_ICW*×*Premium* as controls. In estimating *LT Performanc*e (equation 3), we include acquirer ICW control variables and acquirer characteristics. In addition, we follow Oler (2008) and Oler and Picconi (2014), and include the performance for the 2 years before the acquisition (*Prior-RNOA*).[9]

Ge and McVay (2005), Ashbaugh-Skaife et al. (2007), and Doyle et al. (2007a) show that ICW disclosures under sections 302 and 404 are associated with a number of firm characteristics. Therefore, for each acquirer, we include the following as control variables: *Log Segments*, *Foreign Currency*, *Restructure*, *Salegrw*, *Inventory*, *Log MktV*, *Loss*, *RZscore*, *Log Age*, *Prior Restate*, *Big 4*, *Audit Fees*, *Non-Audit Fees*, *Auditor Change*, and *Mgt Change*. To control for firm characteristics (both target and acquirer), we follow prior studies (Louis 2004, 2005; Moeller et al. 2004; Masulis et al. 2007) and include *Book-to-Market*, *ROA*, *Leverage*, *Regulated Industry*, *Financial Industry*, *Litigation Firm*, and *E-Index*. In addition, we follow prior research on M&A and control for the following deal characteristics (Bates et al. 2006): *Termination Fee*, *Deal Lockup*, *Number of Bidders*, *Entirely Cash Deal*, *Stock Percentage*,[10] *Tender Offer*, *Bidder Toehold*, *Hostile Deal*, *Number of Investment Banks*, and *Same Industry*. (See Appendix 2 for variable definitions.)

4. Sample selection and descriptive statistics

We obtain our acquisition sample from the Securities Data Corporation (SDC) Mergers and Acquisitions database. Table 1, panel A, summarizes our sample construction. We identify 5,226 acquisitions announced by 4,751 unique firms between January 1, 2003, and December 31, 2014, that meet the following criteria:

1. The acquisition is completed (or withdrawn) by December 31, 2014.
2. Both the acquirer and the target are public firms.
3. The acquirer and the target are clearly identifiable (not a merger of equals).
4. The transaction involves at least 50 percent of the target's shares.
5. The deal value is disclosed in the SDC.
6. Both the acquirer and the target are included in the Audit Analytics database.[11]
7. Both the acquirer and the target firm data are available from COMPUSTAT and CRSP.

To identify acquisitions that involve acquirers that disclosed ICWs, we start with 5,226 acquisitions and remove the following acquisitions. We remove 282 acquisitions

9. We also use a change specification to difference away any time-invariant firm characteristics determining *RNOA*. We find similar results, using the change specification (not tabulated).
10. We also use indicator variables for *Entirely Stock Purchase* and *Cash Percentage* as robustness tests (untabulated). The results are qualitatively the same.
11. The Audit Analytics Database includes data for more than 6,000 publicly traded companies per year since Jan. 1, 2001. The database includes detailed information on auditor firms, auditor changes, opinions, disclosures on internal controls under sections 302 and 404, audit legal cases, financial details, and compliance difficulties.

TABLE 1
Sample

Panel A: Sample selection procedure

	Number of acquisition deals
Acquisition deals of public firms for years 2003–2014	11,535
Less:	
Deals in which the acquirer owned *more* than 50 percent of the target's shares *before* the transaction	91
Deals in which the acquirer owned *less* than 51 percent of the target's shares *after* the transaction	1,037
Deals not covered by Audit Analytics	4,065
Number of acquisition deals in the final sample	6,342
Less:	
Deals with missing COMPUSTAT/CRSP data	1,116
Number of deals in our final database	5,226
Less:	
Deals in which the target and the acquirer have ICWs	26
Deals in which the target has ICWs	256
Deals in which the acquirer is in Rice et al. (2015) database	46
Deals in which the acquirers remediated ICWs prior to announcement date	161
The entire sample:	4,737
of which:	
Deals in which neither the acquirer nor the target has ICWs (potential control sample)	4,356
Number of deals by ICW acquirers (treatment sample)	381
of which:	
Completed deals	327
Withdrawn deals	54

Panel B: Sample distribution by announcement year

Year	Number of acquisitions with no ICWs	Number of ICW acquirers	Total
2003	416	7	409
2004	447	9	438
2005	426	38	388
2006	385	36	349
2007	344	55	289
2008	211	44	167
2009	218	33	185
2010	259	24	235
2011	337	27	310
2012	424	35	389
2013	437	33	404
2014	452	40	412
Total	4,356	381	4,737

Notes: This table presents the selection and distribution of the final acquisition sample. Panel A describes the selection procedure. Panel B summarizes the number of deals each year. The final database consists of 4,944 acquisitions announced between 2003 and 2014 that are listed in the SDC and made by firms in the Audit Analytics database. The matched control samples are selected from the 4,356 deals in which neither the acquirer nor the target had reported ICWs under section 302 or 404 before the merger announcement. The ICW sample consists of 381 deals in which the acquirers have reported ICWs (ICW acquirers).

that involve targets with ICWs, of which 26 acquirers also have ICWs. We also delete 46 acquirers that did not disclose ICWs but subsequently restated their financial statements for periods, including the previous fiscal year before their acquisition announcements (Rice et al. 2015).[12] Of the remaining 4,737 deals, 4,356 do not involve any ICW disclosures either on the part of acquirers or target. We select our two sets of matched control samples from these 4,356 deals. The remaining 381 acquisitions constitute our treatment sample of deals made by ICW acquirers that acquired non-ICW targets. Of 381 acquisitions, 327 are completed, and 54 are withdrawn after their announcements.[13]

In panel B of Table 1, we present the distribution of our sample firms for each year of the 12-year period according to their ICW status. Acquisitions involving ICWs in 2003 and 2004 are fewer (total of 16) and represent roughly 4 percent of the ICW acquirer sample, consistent with firms being more likely to disclose ineffective internal controls under section 404 than 302. In addition, we see a decrease in the number of acquisitions during the 2008–2009 financial crisis, but an increase after the crisis.

We construct the PS-matched and IYV-matched control samples to compare with the ICW treatment sample. The purpose of propensity score matching (e.g., Rosenbaum and Rubin 1985) is to select acquirers that have similar ex ante characteristics as the treatment acquirers (ICW acquirers). We match firms by the propensity to have ICWs, using variables defined by Ashbaugh-Skaife et al. (2007) and Doyle et al. (2007a). The details of how we construct the PS-matched sample are presented in Appendix 1. Panel A of Appendix 1 shows that the ROC curve is 0.8193, which is within an "excellent" range of model discrimination (Hosmer and Lemeshow 2004). In addition, panel B of Appendix 1 shows that the estimated propensity scores of the ICW sample and the PS-matched sample are not significantly different. By contrast, panel C of Appendix 1 shows that the estimated propensity scores of the ICW sample are significantly higher than those of the IYV-matched sample, where the latter is formed by matching on three characteristics related to M&A (acquirer industry, year, and deal value) but unrelated to ICWs.

Table 2 presents descriptive statistics (the mean and the median) of the characteristics of acquirers, targets, and acquisitions. The sample characteristics are calculated over the year preceding the acquisition announcement date. Panel A of Table 2 reports descriptive statistics of the three samples of acquirers: the ICW treatment, the PS-matched control, and the IYV-matched samples. The descriptive statistics show that the ICW treatment sample differs significantly from the IYV-matched control sample in several characteristics, such as the number of segments, the level of inventory, firm age, and prior restatements.[14] Although evidence exists that ICW acquirers have higher leverage and greater bankruptcy risk than the acquirers in the PS-matched control sample, the ICW treatment and the PS-matched control samples exhibit many similar properties, such as total assets, market value, book-to-market, ROA, the number of segments, sales growth, inventory, and firm age. The financial characteristics of the acquirers in our sample are generally consistent with those found by Louis (2004, 2005). Panel B shows that the target characteristics for ICW acquirers resemble those of PS-matched acquirers, while they differ from those of IYV-matched acquirers in several attributes. Panel C

12. Because these acquirers are more likely to have had ICWs, but did not disclose them, it would be interesting to analyze them. However, the sample size of 46 acquirers is too small to carry out any meaningful analysis.
13. We use the 327 complete deals in our untabulated sensitivity tests; our results are robust to the exclusion of withdrawn deals.
14. Because the three samples differ in a number of variables (although ICW and PS-matched samples are closely matched), we include all variables as controls in our regressions.

TABLE 2
Descriptive statistics

Panel A: Characteristics of the acquirers

	ICW sample mean [median] (1)	PS-matched control sample mean [median] (2)	IYV-matched control sample mean [median] (3)	*t*-statistic [*Z*-statistic] for diff. between columns (1) and (2) (4)	*t*-statistic [*Z*-statistic] for diff. between columns (1) and (3) (5)
Total Assets ($M)	1,591	1,585	1,581	0.81	0.50
	[648]	[643]	[645]	[0.70]	[0.12]
Market Value ($M)	3,183	3,175	3,178	0.43	0.43
	[2,187]	[2,181]	[2,090]	[0.14]	[0.20]
Book-to-Market	0.490	0.495	0.489	−0.09	0.07
	[0.409]	[0.411]	[0.405]	[−0.05]	[0.11]
ROA	0.097	0.104	0.091	−1.25	0.96
	[0.059]	[0.066]	[0.057]	[−0.73]	[0.38]
Leverage	0.261	0.221	0.270	2.35**	−0.63
	[0.196]	[0.172]	[0.205]	[2.03]**	[−0.39]
Log Segments	1.369	1.361	1.295	0.55	2.0**
	[1.000]	[1.000]	[1.000]	[0.20]	[1.85]*
Salegrw	0.203	0.205	0.194	−0.32	1.21
	[0.162]	[0.167]	[0.155]	[−0.11]	[0.78]
Inventory	0.090	0.101	0.077	−0.38	1.98**
	[0.035]	[0.043]	[0.30]	[−0.24]	[1.85]*
RZscore	5.692	5.919	5.605	−2.02**	1.23
	[5.009]	[5.039]	[4.988]	[−1.85]*	[1.02]
Log Age	7.625	6.892	8.488	−0.69	−2.35**
	[6.000]	[6.000]	[8.000]	[−0.40]	[−2.14]**
Foreign Currency	0.208	0.206	0.179	0.13	1.91*
	[0.000]	[0.000]	[0.000]	[0.05]	[1.66]*
Restructure	0.430	0.408	0.399	0.81	0.71
	[0.000]	[0.000]	[0.000]	[0.37]	[0.42]
Loss	0.362	0.357	0.330	0.35	1.73*
	[0.000]	[0.000]	[0.000]	[0.10]	[1.51]
Litigation Firm	0.360	0.365	0.361	−0.55	−0.05
	[0.000]	[0.000]	[0.000]	[−0.16]	[−0.01]
Prior Restate	0.159	0.117	0.059	1.61	2.29**
	[0.000]	[0.000]	[0.000]	[1.30]	[2.00]**
Big 4	0.960	0.951	0.951	0.65	0.73
	[1.000]	[1.000]	[1.000]	[0.41]	[0.60]
Audit Fees	59.715	59.425	58.189	0.45	1.70*
	[48.878]	[48.231]	[47.199]	[0.36]	[1.57]
Non-Audit Fees	12.871	12.861	12.885	0.20	−0.71
	[6.430]	[6.426]	[6.431]	[0.04]	[−0.28]
Auditor Change	0.088	0.090	0.092	−0.48	−0.43
	[0.000]	[0.000]	[0.000]	[−0.34]	[−0.38]
Mgt Change	0.283	0.296	0.313	−1.48	−1.72*
	[0.000]	[0.000]	[0.000]	[−0.83]	[−1.50]

(The table is continued on the next page.)

TABLE 2 (continued)

Panel A: Characteristics of the acquirers

	ICW sample mean [median] (1)	PS-matched control sample mean [median] (2)	IYV-matched control sample mean [median] (3)	*t*-statistic [*Z*-statistic] for diff. between columns (1) and (2) (4)	*t*-statistic [*Z*-statistic] for diff. between columns (1) and (3) (5)
Regulated Industry	0.041	0.041	0.043	−0.11	0.11
	[0.000]	[0.000]	[0.000]	[−0.06]	[0.08]
Financial Industry	0.119	0.122	0.118	−0.17	0.09
	[0.000]	[0.000]	[0.000]	[−0.06]	[0.02]
Observations	381	381	381		

Panel B: Characteristics of the targets

	ICW sample mean [median] (1)	PS-matched control sample mean [median] (2)	IYV-matched control sample mean [median] (3)	*t*-statistic [*Z*-statistic] for diff. between columns(1) and (2) (4)	*t*-statistic [*Z*-statistic] for diff. between columns (1) and (3) (5)
Total Assets ($M)	1,058	1,081	1,177	−0.90	−1.79 *
	[405]	[407]	[401]	[−0.61]	[−1.55]
Market Value ($M)	1,923	1,957	1,941	−1.42	−0.85
	[815]	[849]	[822]	[−0.66]	[−0.49]
Book-to-Market	0.490	0.485	0.510	0.71	−1.20
	[0.445]	[0.441]	[0.453]	[0.52]	[−0.95]
ROA	−0.002	0.002	0.002	−0.78	−0.94
	[−0.000]	[0.000]	[0.000]	[−0.35]	[−0.48]
Leverage	0.237	0.253	0.277	−1.82*	−2.18**
	[0.226]	[0.233]	[0.245]	[−1.61]	[−1.88]*
Log Segments	1.255	1.230	1.193	0.87	1.03
	[1.000]	[1.000]	[1.000]	[0.35]	[0.71]
Salegrw	0.215	0.211	0.268	0.49	−2.21**
	[0.177]	[0.175]	[0.187]	[0.30]	[−1.93]*
Inventory	0.080	0.072	0.068	1.01	1.43
	[0.030]	[0.026]	[0.022]	[0.83]	[1.01]
RZscore	5.201	5.263	4.917	−1.92*	2.19**
	[4.764]	[4.820]	[4.560]	[−1.40]	[2.00]**
Log Age	5.590	5.185	5.099	1.88*	2.35**
	[5.000]	[4.000]	[4.000]	[1.73]*	[2.04]**
Foreign Currency	0.188	0.184	0.151	0.75	1.83*
	[0.000]	[0.000]	[0.000]	[0.43]	[1.59]
Restructure	0.405	0.371	0.343	2.10**	2.88***
	[0.000]	[0.000]	[0.000]	[1.86]*	[2.47]**
Loss	0.341	0.345	0.392	−0.46	−1.99**
	[0.000]	[0.000]	[0.000]	[−0.27]	[−1.76]*

(The table is continued on the next page.)

TABLE 2 (continued)

Panel B: Characteristics of the targets

	ICW sample mean [median] (1)	PS-matched control sample mean [median] (2)	IYV-matched control sample mean [median] (3)	*t*-statistic [*Z*-statistic] for diff. between columns(1) and (2) (4)	*t*-statistic [*Z*-statistic] for diff. between columns (1) and (3) (5)
Litigation Firm	0.089	0.078	0.100	1.03	−0.88
	[0.000]	[0.000]	[0.000]	[0.51]	[−0.25]
Prior Restate	0.063	0.060	0.058	0.72	1.05
	[0.000]	[0.000]	[0.000]	[0.50]	[0.80]
Big 4	0.912	0.902	0.926	−1.06	−0.38
	[1.000]	[1.000]	[1.000]	[−0.92]	[−0.25]
Audit Fees	58.361	58.391	58.297	−1.89*	0.95
	[47.243]	[47.280]	[47.245]	[−1.68]*	[−0.21]
Non-Audit Fees	12.898	12.861	12.814	0.56	0.91
	[6.584]	[6.573]	[6.521]	[0.39]	[0.75]
Auditor Change	0.089	0.080	0.093	1.29	−0.37
	[0.000]	[0.000]	[0.000]	[0.94]	[−0.24]
Mgt Change	0.329	0.312	0.305	1.68*	1.69*
	[0.000]	[0.000]	[0.000]	[1.16]	[1.05]
Regulated Industry	0.060	0.061	0.059	−0.14	0.05
	[0.000]	[0.000]	[0.000]	[−0.06]	[0.02]
Financial Industry	0.024	0.023	0.026	0.21	−0.11
	[0.000]	[0.000]	[0.000]	[0.05]	[−0.07]
Observations	381	381	381		

Panel C: Deal characteristics

	ICW sample mean [median] (1)	PS-matched control sample mean [median] (2)	IYV-matched control sample mean [median] (3)	*t*-statistic [*Z*-statistic] for diff. between columns (1) and (2) (4)	*t*-statistic [*Z*-statistic] for diff. between columns (1) and (3) (5)
Termination Fee	0.402	0.410	0.395	−0.51	0.22
	[0.000]	[0.000]	[0.000]	[−0.35]	[0.17]
Deal Lockup	0.180	0.185	0.184	−0.52	−0.51
	[0.000]	[0.000]	[0.000]	[−0.47]	[−0.43]
Number of Bidders	1.030	1.035	1.034	−0.35	−0.25
	[1.000]	[1.000]	[1.000]	[−0.15]	[−0.19]
Entirely Cash Deal	0.544	0.507	0.488	1.08	1.40
	[1.000]	[1.000]	[0.000]	[0.85]	[1.15]
Stock Percentage	0.127	0.125	0.133	0.32	0.84
	[0.000]	[0.000]	[0.000]	[0.08]	[0.35]
Tender Offer	0.635	0.629	0.644	0.31	−0.28
	[1.000]	[1.000]	[1.000]	[0.17]	[−0.12]

(The table is continued on the next page.)

TABLE 2 (continued)

Panel C: Deal characteristics

	ICW sample mean [median] (1)	PS-matched control sample mean [median] (2)	IYV-matched control sample mean [median] (3)	*t*-statistic [*Z*-statistic] for diff. between columns (1) and (2) (4)	*t*-statistic [*Z*-statistic] for diff. between columns (1) and (3) (5)
Bidder Toehold	0.023	0.020	0.014	0.50	1.16
	[0.000]	[0.000]	[0.000]	[−0.26]	[0.72]
Hostile Deal	0.004	0.003	0.003	0.14	0.19
	[0.000]	[0.000]	[0.000]	[0.02]	[0.05]
Number of Investment Banks	0.628	0.612	0.653	1.51	−0.92
	[1.000]	[1.000]	[1.000]	[1.38]	[0.69]
Same Industry	0.599	0.590	0.601	0.37	−0.13
	[1.000]	[1.000]	[1.000]	[0.25]	[−0.07]
Deal Value	1,092	1,131	1,101	−1.09	−0.35
	[167]	[188]	[170]	[−0.63]	[−0.22]
Observations	381	381	381		

Notes: This table summarizes the characteristics of acquirer and target firms in our samples. Panel A presents the descriptive statistics for the acquirer firm characteristics in all the deals involving ICW acquirers and the two control samples. Panel B presents the descriptive statistics for the target firm characteristics in all the deals involving ICW acquirers and the two control samples. Panel C presents the deal characteristics for all the deals involving ICW acquirers and the two control samples. See Appendix B for variable definitions. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, based on two-tailed *t*-statistics or *Z*-statistics, respectively.

reports deal characteristics, including *Termination Fee*, *Deal Lockup*, *Number of Bidders*, *Entirely Cash Deal*, *Stock Percentage*, *Tender Offer*, *Bidder Toehold*, *Hostile Deal*, *Number of Investment Banks*, *Same Industry*, and *Deal Value*. These characteristics appear to be similar among all three samples. In terms of the methods of payment, roughly 54 percent, 51 percent, and 49 percent of the deals are completed with 100 percent cash for the ICW, PS-matched, and IYV-matched samples, respectively.

5. Results

Acquisition premiums

We first investigate whether ICW acquirers pay larger premiums than non-ICW acquirers. Panels A and B of Table 3 report the average premiums paid to targets by their acquirers using stock- and accounting-based measures of premiums. Additionally, to evaluate the economic magnitude of the premium, we calculate the premium in dollars by multiplying the percentage stock-based premium by the target's market value 42 days before the announcement date. Panel A reports univariate results for the ICW treatment sample as well as for the PS- and IYV-matched control samples. The average (median) stock-based premium paid to targets is 42.05 percent (35.41 percent) by ICW acquirers and 40.55 percent (31.70 percent) by PS-matched acquirers. The difference in premiums paid by the two groups of acquirers is only marginally significant at the 10 percent level

TABLE 3
Value of the premium for deals in which acquirers have ICWs

Panel A: Stock-based premium

Variable	PS-matched control sample		IYV-matched control sample	
	Premium (%) [median]	*Premium* ($M) [median]	*Premium* (%) [median]	*Premium* ($M) [median]
Treatment	42.05% [35.41%]	825 [295]	42.05% [35.41%]	825 [295]
Control	40.55% [31.70%]	794 [269]	36.82% [29.09%]	778 [242]
t-statistic [*Z*-statistic] for difference between Treatment and Control	1.72* [1.80]*	1.33 [0.78]	2.44** [2.36]**	1.92* [2.16]**
# Observations	762	762	762	762

Panel B: Accounting-based premium

Variable	PS-matched control sample		IYV-matched control sample	
	Sales/Deal Value [median]	*EBITDA/Deal Value* [median]	*Sales/Deal Value* [median]	*EBITDA/Deal Value* [median]
Treatment	0.903 [0.521]	0.097 [0.082]	0.903 [0.521]	0.097 [0.082]
Control	0.929 [0.532]	0.105 [0.086]	0.958 [0.549]	0.114 [0.094]
t-statistic [*Z*-statistic] for difference between Treatment and Control	1.66* [1.59]	1.31 [1.08]	2.81*** [2.62]***	2.48** [2.22]**
Observations	762	762	762	762

Notes: This table reports the distribution of the deal premiums. Panel A (panel B) compares the stock (accounting)-based premiums paid by ICW acquirers with those paid by acquirers in the control samples. The accounting-based premium measures in panel B are inverse multiples (the higher their value, the lower the deal premium). ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, based on two-tailed *t*-statistics or *Z*-statistics, respectively.

and is no longer significant when we evaluate the premium in dollars.[15] However, we find that ICW acquirers pay significantly larger premiums than IYV-matched acquirers. The average (median) premium paid is 42.05 percent (35.41 percent) by ICW acquirers and 36.82 percent (29.09 percent) by IYV-matched acquirers. The difference is statistically significant at the 5 percent level. ICW acquirers may pay larger premiums because their managers rely on poor-quality information generated by ineffective internal controls, or the underlying determinants of ICWs cause the larger premiums. The difference in the premiums paid by PS-matched and IYV-matched acquirers is significant at the 10 percent level (untabulated).

We next use accounting-based valuation multiples to measure premiums to alleviate the concern that stock-based premiums may lead to incorrect inferences, as they are subject to many other factors such as the method of acquisition (negotiated deals versus

15. All significant tests in the univariate analyses are two-tailed *t*-statistics (*Z*-statistics) based on subsample means (medians) and standard errors.

tender offers) and the probability of completion (Gong et al. 2008; Raman et al. 2013; Skaife and Wangerin 2013). By contrast, an accounting-based premium may better reflect how much an acquirer is willing to pay based on its valuation of the target. Following De Franco et al. (2011), we define premium as *Sales/Deal Value* and *EBITDA/Deal Value* and repeat the analysis. Note that these measures are inverse multiples; the higher their value, the lower the deal premium. Consistent with panel A, panel B of Table 3 shows that ICW acquirers pay larger premiums than IYV-matched acquirers. The difference is statistically significant at the 1 percent (5 percent) level for the *Sales/Deal Value* (*EBITDA/Deal Value*) measure. However, the difference in premiums paid by ICW acquirers and PS-matched

TABLE 4
Regression analysis of the premium for deals in which acquirers have ICWs

Panel A: Regression analysis of stock-based premium (*Premium (%)*)

	Dependent variable*: Premium (%)*				
	ICW and PS samples		ICW and IYV samples		PS and IYV samples
	Model 1 Coeff. (*t*-stat)	Model 2 Coeff. (*t*-stat)	Model 3 Coeff. (*t*-stat)	Model 4 Coeff. (*t*-stat)	Model 5 Coeff. (*t*-stat)
Intercept	0.185*	0.216**	0.171**	0.161***	0.211***
	(1.82)	(2.27)	(2.46)	(2.83)	(3.98)
Acq_ICW	0.030		0.024**		
	(1.16)		(2.21)		
Log(1 + Num Acq Weaknesses)		0.013		0.009*	
		(0.87)		(1.98)	
PS-Indicator					0.016*
					(1.81)
Deal characteristics					
Termination Fee	−0.046	−0.043	−0.054	−0.054	−0.036
	(−0.38)	(−0.57)	(−1.44)	(−1.48)	(−0.40)
Deal Lockup	−0.012	−0.011	−0.011	−0.012	−0.015
	(−1.41)	(−1.37)	(−0.82)	(−0.80)	(−1.00)
Number of Bidders	0.056**	0.060**	0.080**	0.081**	0.050***
	(2.13)	(2.12)	(2.19)	(2.27)	(2.77)
Entirely Cash Deal	0.030	0.031	0.030	0.030	0.028
	(1.48)	(1.36)	(1.18)	(1.22)	(1.41)
Stock Percentage	0.039***	0.039***	0.062*	0.063*	0.045***
	(4.02)	(4.10)	(1.88)	(1.94)	(3.38)
Tender Offer	0.051***	0.050***	0.060***	0.061***	0.050***
	(2.91)	(2.89)	(4.97)	(5.16)	(3.62)
Bidder Toehold	−0.188**	−0.197**	−0.094*	−0.094*	−0.109*
	(−2.27)	(−2.45)	(−1.90)	(−1.92)	(−1.83)
Hostile Deal	−0.052	−0.052	−0.058	−0.058	−0.051
	(−1.04)	(−1.01)	(−1.38)	(−1.42)	(−1.41)
Number of Investment Banks	0.012	0.011	0.001	0.001	0.002
	(1.28)	(1.16)	(0.06)	(0.04)	(0.29)
Same Industry	0.040*	0.040*	0.059**	0.061**	0.064***
	(1.75)	(1.72)	(2.31)	(2.44)	(2.88)
Deal Value	0.056**	0.058**	0.062***	0.062***	0.071**
	(2.28)	(2.35)	(2.81)	(2.73)	(2.50)

(The table is continued on the next page.)

TABLE 4 (continued)

Panel A: Regression analysis of stock-based premium (*Premium (%)*)

	Dependent variable: *Premium (%)*				
	ICW and PS samples		ICW and IYV samples		PS and IYV samples
	Model 1 Coeff. (*t*-stat)	Model 2 Coeff. (*t*-stat)	Model 3 Coeff. (*t*-stat)	Model 4 Coeff. (*t*-stat)	Model 5 Coeff. (*t*-stat)
Acq ICW control variables					
Log Acq Segments	0.015	0.017	0.021	0.021	0.024
	(0.76)	(0.93)	(1.01)	(0.98)	(1.33)
Acq Foreign Currency	0.007	0.007	0.005	0.004	0.004
	(0.44)	(0.47)	(0.41)	(0.45)	(0.52)
Acq Restructure	0.103	0.103	0.106	0.105	0.104
	(1.32)	(1.28)	(0.73)	(0.81)	(0.99)
Acq Salegrw	0.001	0.001	0.001	0.001	0.001
	(0.27)	(0.21)	(0.20)	(0.17)	(0.32)
Acq Inventory	0.010*	0.012**	0.020**	0.020**	0.015**
	(1.82)	(2.01)	(2.21)	(2.33)	(2.24)
Acq Log MktV	−0.090***	−0.090***	−0.087**	−0.085**	−0.083**
	(−2.69)	(-2.61)	(−2.16)	(−2.02)	(−2.08)
Acq Loss	0.124*	0.126**	0.092*	0.092*	0.100*
	(1.87)	(2.09)	(1.80)	(1.86)	(1.77)
Acq RZscore	0.001	0.001	0.001	0.001	0.001
	(0.57)	(0.54)	(0.33)	(0.37)	(0.35)
Acq Log Age	−0.023***	−0.023***	−0.020**	−0.021**	−0.021**
	(−2.69)	(−2.62)	(−2.13)	(−2.05)	(−2.31)
Acq Prior Restate	−0.008*	−0.007*	−0.010**	−0.010**	−0.004
	(−1.81)	(−1.77)	(−2.22)	(−2.28)	(−1.46)
Acq Big 4	0.053	0.053	0.041	0.041	0.050
	(0.94)	(0.99)	(0.51)	(0.50)	(1.22)
Acq Audit Fees	−0.022*	−0.021*	−0.027	−0.027	−0.019
	(−1.71)	(−1.68)	(−1.62)	(−1.60)	(−1.41)
Acq Non-Audit Fees	−0.001	−0.001	−0.001	−0.001	−0.001
	(−0.63)	(−0.59)	(−0.12)	(−0.10)	(−0.40)
Acq Auditor Change	0.035*	0.034*	0.025*	0.024*	0.026*
	(1.86)	(1.90)	(1.92)	(1.88)	(1.87)
Acq Mgt Change	−0.067*	−0.067*	−0.078**	−0.080**	−0.055*
	(−1.89)	(−1.85)	(−2.15)	(−2.27)	(−1.77)
Additional control variables	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)
Acq characteristic	2.38	2.69	1.84	1.99	1.60
	(0.02)	(0.01)	(0.08)	(0.06)	(0.14)
Tar characteristics	4.27	5.02	3.43	3.19	9.52
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Matched-pair fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	762	762	762	762	762
Adj R^2	0.077	0.073	0.087	0.085	0.071

(The table is continued on the next page.)

TABLE 4 (continued)

Panel B: Regression analysis of accounting-based premium (*Sales/Deal Value*)

	Dependent variable*: Sales/Deal Value*				
	ICW and PS samples		ICW and IYV samples		PS and IYV samples
	Model 1 Coeff. (*t*-stat)	Model 2 Coeff. (*t*-stat)	Model 3 Coeff. (*t*-stat)	Model 4 Coeff. (*t*-stat)	Model 5 Coeff. (*t*-stat)
Intercept	−0.004***	−0.005***	−0.003***	−0.005**	−0.010***
	(−2.71)	(−3.01)	(−3.32)	(−4.19)	(−4.11)
Acq_ICW	−0.002		−0.004**		
	(−0.95)		(−2.36)		
Log(1+Num Acq Weaknesses)		−0.001		−0.001*	
		(−0.69)		(−1.77)	
PS-Indicator					−0.003**
					(−2.01)
Deal characteristics					
Termination Fee	0.001	0.001	0.004	0.005	0.005
	(0.22)	(0.15)	(0.62)	(0.68)	(0.82)
Deal Lockup	0.000	0.000	0.000	0.000	0.000
	(0.18)	(0.20)	(0.04)	(0.04)	(0.01)
Number of Bidders	−0.002**	−0.002**	−0.001	−0.001	−0.001
	(−2.03)	(−2.00)	(−1.46)	(−1.42)	(−1.56)
Entirely Cash Deal	−0.000	−0.000	−0.001	−0.001	−0.000
	(−0.09)	(−0.07)	(−1.12)	(−1.17)	(−0.20)
Stock Percentage	−0.004***	−0.003***	−0.001**	−0.001**	−0.004***
	(−4.16)	(−4.46)	(−2.15)	(−2.11)	(−2.82)
Tender Offer	−0.005*	−0.005*	−0.002**	−0.002**	−0.002**
	(−1.81)	(−1.73)	(−2.35)	(−2.29)	(−2.07)
Bidder Toehold	0.004	0.004	0.010	0.010	0.010
	(1.30)	(1.22)	(0.40)	(0.47)	(0.22)
Hostile Deal	0.000	0.000	0.001**	0.001**	0.000
	(0.36)	(0.29)	(1.99)	(2.10)	(0.68)
Number of Investment Banks	−0.000	−0.000	−0.001	−0.001	−0.000
	(−0.01)	(−0.01)	(−0.01)	(−0.01)	(−0.01)
Same Industry	−0.002***	−0.002***	−0.005**	−0.005**	−0.003***
	(−2.85)	(−2.94)	(−2.25)	(−2.36)	(−2.59)
Acq ICW control variables					
Log Acq Segments	−0.001	−0.001	−0.002*	−0.002*	−0.001
	(−0.34)	(−0.41)	(−1.82)	(−1.77)	(−1.38)
Acq Foreign Currency	−0.000	−0.000	−0.000	−0.000	−0.000
	(−0.10)	(−0.14)	(−0.05)	(−0.05)	(−0.14)
Acq Restructure	−0.004	−0.003	−0.002	−0.002	−0.0043
	(−1.21)	(−1.39)	(−0.83)	(−0.75)	(−1.60)
Acq Salegrw	−0.001	−0.001	−0.000‘	−0.000	−0.001
	(−0.33)	(−0.32)	(−0.05)	(−0.09)	(−0.31)
Acq Inventory	−0.001**	−0.001**	−0.001	−0.001	−0.001*
	(−2.27)	(−2.19)	(−1.27)	(−1.19)	(−1.71)
Acq Log MktV	0.003***	0.004***	0.002**	0.002**	0.003**
	(3.12)	(3.19)	(2.19)	(2.16)	(2.38)

(The table is continued on the next page.)

TABLE 4 (continued)

Panel B: Regression analysis of accounting-based premium (*Sales/Deal Value*)

	Dependent variable*: Sales/Deal Value*				
	ICW and PS samples		ICW and IYV samples		PS and IYV samples
	Model 1 Coeff. (*t*-stat)	Model 2 Coeff. (*t*-stat)	Model 3 Coeff. (*t*-stat)	Model 4 Coeff. (*t*-stat)	Model 5 Coeff. (*t*-stat)
Acq Loss	−0.007**	−0.007**	−0.001	−0.001	−0.003**
	(2.31)	(−2.28)	(1.51)	(−1.57)	(−2.16)
Acq RZscore	−0.000	−0.000	−0.000	−0.000	−0.000
	(−0.05)	(−0.05)	(−0.06)	(−0.11)	(-0.14)
Acq Log Age	−0.002***	−0.002***	−0.000	−0.000	−0.002**
	(−3.11)	(−3.19)	(−0.88)	(−0.82)	(−2.10)
Acq Prior Restate	0.004**	0.004**	0.001*	0.001*	0.001*
	(2.40)	(2.47)	(1.71)	(1.70)	(1.88)
Acq Big 4	0.003	0.003	0.001	0.001	0.001
	(1.02)	(0.95)	(0.40)	(0.42)	(0.41)
Acq Audit Fees	0.000	0.000	0.000	0.000	0.000
	(0.88)	(0.81)	(1.12)	(1.15)	(0.73)
Acq Non-Audit Fees	0.000	0.000	0.000	0.000	0.000
	(0.01)	(0.01)	(0.09)	(0.12)	(0.06)
Acq Auditor Change	−0.003	−0.004	−0.006*	−0.006*	−0.004
	(−1.37)	(−1.48)	(−1.89)	(−1.92)	(−1.30)
Acq Mgt Change	0.003***	0.003***	0.006*	0.006*	0.003***
	(3.20)	(3.07)	(1.84)	(1.88)	(3.12)
Additional control variables	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)
Acq characteristics	2.12	2.53	1.71	1.90	1.77
	(0.05)	(0.02)	(0.11)	(0.07)	(0.10)
Tar characteristics	4.92	5.28	6.17	5.95	11.58
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Matched-pair fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	762	762	762	762	762
Adj R^2	0.078	0.074	0.080	0.079	0.074

Notes: This table reports the results of OLS regressions using the premium as the dependent variable. Panel A reports the results using the stock-based premium (*Premium %*) as the dependent variable, while panel B presents the results using the accounting-based premium (*Sales/Deal Value*) as the dependent variable; *t*-statistics are based on standard errors clustered by year (Gow et al., 2010; Petersen, 2009), and ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively. Industry and year fixed effects are included in all the models. See Appendix 2 for variable definitions.

acquirers is marginally significant for *Sales/Deal Value*, but not significant for *EBITDA/Deal Value*.

Table 4 reports the results of regressions, controlling for various deal, acquirer, and target characteristics that are found to influence acquisition premiums and the

characteristics associated with ICW disclosures (equation 1). The dependent variable is the stock-based premium in panel A and the accounting-based premium (defined as *Sales/Deal Value*) in panel B.[16] The acquirers' ICW status is the variable of interest and is defined in two ways: (i) an indicator variable with a value of one if a firm has disclosed ICWs and zero otherwise (*Acq_ICW*), and (ii) the number of material weaknesses disclosed (in natural logarithm *Log(1 + Num Acq Weaknesses)*).

We estimate a series of regressions on pairs of samples: (i) Models 1 and 2 include both ICW and PS-matched acquirers; (ii) Models 3 and 4 include both ICW and IYV-matched acquirers. Finally, Model 5 compares the two control samples in the regression. All models include control variables related to internal control weaknesses, and firm and deal characteristics, as previously described.

Results based on Models 1 and 2 in panel A reveal that *Premium* is not significantly associated with *Acq_ICW* when we compare the ICW treatment sample with the PS-matched control sample. Neither the coefficient on *Acq_ICW* nor that on *Log(1 + Num Acq Weaknesses)* is significant. By contrast, results for Models 3 and 4 show that the coefficients on both *Acq_ICW* and *Log(1 + Num Acq Weaknesses)* are positive and statistically significant when we compare the ICW treatment sample with the IYV-matched control sample. The coefficient on *Acq_ICW* is 0.024 with a *t*-statistic of 2.21. Evaluated at the average target market value of $1.941 billion, this suggests that ICW acquirers on average pay $46.6 million more in premium than IYV-matched acquirers. The finding that ICW acquirers pay a higher premium than IYV-matched acquirers, but not PS-matched acquirers, does not support Hypothesis 1 as stated. However, the difference in results between Models 1 and 2 and Models 3 and 4 suggests that firms with similar propensity scores, based upon the characteristics associated with ICW disclosures, behave similarly to ICW acquirers in terms of paying larger premiums even though they have not disclosed ICWs. One possible explanation is that these firms are also suffering from ineffective control, leading to suboptimal M&A decisions. Another possible explanation is that it is the underlying characteristics, which both the treatment sample and the PS-matched sample share, that drive the larger premiums paid.

Model 5 includes the two control samples. PS-matched acquirers are identified by *PS-Indicator*. We find that the coefficient on *PS-Indicator* is positive and marginally significant (coefficient = 0.016, *t*-statistic = 1.81), indicating that PS-matched acquirers also pay larger premiums than IYV-matched acquirers. In addition, we find that the coefficients on *Number of Bidders*, *Stock Percentage*, *Tender Offer*, *Same Industry*, *Acq Inventory*, and *Acq Loss* are positive and significant, while those on *Bidder Toehold*, *Acq Log MktV*, *Acq Log Age*, *Acq Prior Restate*, *Acq Audit Fees*, and *Acq Mgt Change* are negative and significant across all five models.

The results are qualitatively the same when we use an accounting-based premium (the coefficient on *Acq_ICW* is negative since the accounting-based premium measure is an inverse multiple of premium). Panel B of Table 4 shows that acquirers with ICWs do not pay significantly more than PS-matched acquirers (coefficient on *Acq_ICW* = −0.002, *t*-statistic = −0.95). However, ICW acquirers pay larger premiums than IYV-matched acquirers. The coefficient on *Acq_ICW* = −0.004 and is significant with a *t*-statistic of −2.36. When we compare the two control samples, we still find that PS-matched acquirers pay larger premiums than IYV-matched acquirers (coefficient on *PS-Indicator* = −0.003 with *t*-statistic = −2.01).

16. The results are robust when we use *EBITDA/Deal Value* as the accounting-based premium instead as well as when we delete observations with negative *EBITDA*.

TABLE 5
CARs around the announcement dates for deals in which acquirers have ICWs

Variable	ICW and PS samples		ICW and IYV samples	
	Acquirer CAR (0,+1) [median]	*Adj-Acquirer CAR (0,+1)* [median]	*Acquirer CAR (0,+1)* [median]	*Adj-Acquirer CAR (0,+1)* [median]
Treatment	−2.76% [−2.18%]	−3.08% [−2.71%]	−2.76% [−2.18%]	−3.08% [−2.71%]
Control	−0.86% [−0.53%]	−1.00% [−0.61%]	−0.44% [−0.28%]	−0.50% [−0.20%]
t-statistic [*Z*-statistic] for difference between Treatment and Control	−4.02*** [−3.19]***	−4.27*** [−2.70]***	−4.33*** [−3.15]***	−4.55*** [−3.46]***
Observations	762	762	762	762

Notes: This table reports the distribution of market-adjusted cumulative abnormal returns (CARs) of the acquirer and the target around the M&A announcement dates for the ICW acquirer sample and the PS-matched and the IYV-matched control samples. The table also shows the *t*-statistics (*Z*-statistics) of testing the differences in the mean (median) between the treatment sample and the control samples. *** denotes significance at the 0.01 level. See Appendix 2 for variable definitions.

Announcement returns

To evaluate the market's assessment of the acquisition, we estimate abnormal stock returns (*CAR*) over the 2-day (0,+1) window around the acquisition announcement dates ("day zero"). The announcement-period *CAR* is computed using the market model, and its parameters are estimated over the 200 days, ending 20 days before the deal announcement with the CRSP value-weighted NYSE/AMEX/NASDAQ returns as the market index.[17]

Table 5 reports the mean (median) *CAR* estimates for the 381 acquisition deals announced by ICW acquirers. We present results for *Acquirer CAR* and *Acquirer CAR* adjusted-for-toehold shares.[18] As before, we compare the announcement returns of the treatment sample with those of the PS-matched and IYV-matched control samples. The mean (median) value of ICW *Acquirer CAR* is −2.76 percent (−2.18 percent) over the 2 days. By contrast, the mean (median) *Acquirer CAR* for the PS-matched and the IYV-matched control samples are −0.86 percent (−0.53 percent) and −0.44 percent (−0.28 percent), respectively, both significantly higher than that of the ICW sample. The difference (in mean or median) between ICW and both groups of matched acquir-

17. Prior event studies have used various windows (see Halpern 1983 for a review). We use the 2-day short window to avoid confounding events. However, we find that using the 3- or 5-day event window does not qualitatively affect our results (not tabulated).

18. We adjust *Acquirer CAR*s for the toehold shares (<50 percent) they already owned of their targets, using the procedure suggested by Bates et al. (2006):

$$AdjCAR_{Acq} = (\Delta AMV_{Acq} - \alpha \Delta AMV_T)/MV_{Acq} - \alpha MV_T,$$

where ΔAMV_i is the abnormal change in the market value and is defined as $\Delta AMV_i = MV_i \times CAR_i$, and $i = Acq$ *AdjCAR* essentially adjusts both the *MV* and the abnormal *MV* of the acquirer by removing the portion attributed to the toehold.

TABLE 6
Regression analysis of acquirer market returns around announcement dates

	Dependent variable: *Acquirer CAR (0,+1)*				
	ICW and PS samples		ICW and IYV samples		PS and IYV samples
	Model 1 Coeff. (*t*-stat)	Model 2 Coeff. (*t*-stat)	Model 3 Coeff. (*t*-stat)	Model 4 Coeff. (*t*-stat)	Model 5 Coeff. (*t*-stat)
Intercept	0.039*	0.018**	0.021***	0.012***	0.031***
	(1.93)	(2.38)	(3.18)	(2.91)	(2.91)
Acq_ICW	−0.005**	−0.003*	−0.007**	−0.005**	
	(−2.20)	(−1.72)	(−2.11)	(−2.25)	
Premium (%)	−0.015***		−0.006**		−0.015***
	(−2.97)		(−2.48)		(−3.61)
Acq_ICW×Premium (%)	−0.004**		−0.002**		
	(−2.15)		(−1.99)		
Sales/Deal Value		0.004***		0.003***	
		(3.39)		(3.07)	
Acq_ICW×Sales/Deal Value		0.003*		0.001*	
		(1.89)		(1.77)	
PS-Indicator					−0.002*
					(−1.71)
PS-Indicator×Premium (%)					−0.001
					(−1.28)
Control variables	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)
Deal characteristics	8.28	7.83	6.42	6.02	13.90
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Acq ICW characteristics	2.04	1.97	1.83	1.95	2.24
	(0.03)	(0.03)	(0.05)	(0.03)	(0.01)
Acq characteristics	3.19	2.89	4.37	4.05	3.62
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tar characteristics	5.17	4.76	3.66	3.02	7.20
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Matched-pair fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	762	762	762	762	762
Adj R^2	0.036	0.039	0.028	0.029	0.026

Notes: This table presents the results of the OLS regression of the acquirer's CAR using the ICW acquirer sample and the matched control samples. *t*-statistics are based on standard errors clustered by year (Gow et al. 2010; Petersen 2009), and ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively. Industry and year fixed effects are included in all the models. *F*-statistics (*p*-values) of testing the joint significance of control variables within each group are reported. See Appendix 2 for variable definitions.

ers is significant at the 1 percent level. However, the difference between the PS-matched and the IYV-matched samples is marginally significant at the 10 percent level (untabulated).

We next examine *Acquirer CAR* in a multivariate setting to control for *Premium* and other omitted variables correlated with the effect of ICW disclosures. In Table 6, we report the results of the regression models that incorporate cross-sectional variations in acquisition deal characteristics and firm characteristics (equation 2). The dependent variable, *Acquirer CAR*, is the 2-day, announcement-window abnormal returns. We control for *Premium* and *Acq_ICW* × *Premium* to capture the fact that, upon the deal announcement, market participants evaluate the terms of the merger transactions.

We estimate regressions on matched-pair samples, including ICW acquirers and PS-matched acquirers (Models 1 and 2), ICW acquirers and IYV-matched acquirers (Models 3 and 4), and the two control samples (Model 5). In Model 1, the coefficient on *Acq_ICW* is negative and significant (coefficient = −0.005, *t*-statistic = −2.20), suggesting that the market expects ICW acquirers to make poorer acquisitions relative to PS-matched acquirers. The coefficient on *Premium (%)* is negative and significant (coefficient = −0.015, *t*-statistic = −2.97), suggesting that the market responds more negatively to acquirers that pay larger premiums. Moreover, the coefficient on *Acq_ICW* × *Premium(%)* is negative and significant (coefficient = −0.004, *t*-statistic = −2.15), indicating that investors react more negatively to high premiums paid by ICW acquirers perhaps because they believe that firms with ICWs are more likely to overpay. We find similar results when we use the accounting-based measure of premium in Model 2.

Models 3 and 4 show similar results for IYV-matched relative to ICW acquirers. The coefficients on *Acq_ICW* are negative and significant in Model 3 (coefficient = −0.007, *t*-statistic = −2.11) and Model 4 (coefficient = −0.005, *t*-statistic = −2.25). The coefficients on *Premium (%)* and *Acq_ICW* × *Premium (%)* in Model 3 are negative and significant (coefficient = −0.006, *t*-statistic = −2.48, coefficient = −0.002, *t*-statistic = −1.99, respectively). Furthermore, the coefficients on *Sales/Deal Value* and *Acq_ICW* × *Sales/Deal Value* in Model 4 are positive and significant (coefficient = 0.003, *t*-statistic = 3.07, coefficient = 0.001, *t*-statistic = 1.77, respectively).

Finally, in Model 5, we compare the two control samples. We find that the coefficient on PS-Indicator is negative and marginally significant (coefficient = −0.002, *t*-statistic = −1.71), indicating that the market expects PS-matched acquirers to make poorer acquisitions relative to IYV-matched acquirers. The market appears to discount PS-matched acquirers based on the characteristics they possess that are similar to ICW acquirers. The coefficient on *Premium (%)* is negative and significant but not significant on its interaction term with *PS-Indicator*. Overall, evidence presented in Table 6 supports Hypothesis 2, suggesting that the announcement returns of ICW acquirers are lower than those of non-ICW acquirers.

In our regressions, we control for the characteristics of the deals, acquirers, targets, and acquirers' characteristics associated with ICWs. All of the control variables have the expected signs and are consistent with prior work (e.g., Louis 2004, 2005; Bates et al. 2006; Masulis et al. 2007). For example, in all models, we find that *Acquirer CAR* is higher when the bids are entirely cash financed, for tender offers, and when the target and the acquirer are in the same industry. By contrast, the *Acquirer CAR* decreases with the stock percentage of acquisition finance, the acquirer's market value, and if the acquirer reported a loss in the previous year.

TABLE 7
Future performance

Panel A: Acquirer post-acquisition performance

Variable	ICW and PS samples		ICW and IYV samples	
	2-Year BHAR [median]	*2-Year RNOA* [median]	*2-Year BHAR* [median]	*2-Year RNOA* [median]
Treatment	−11.69% [−12.08%]	0.085 [0.087]	−11.69% [−12.08%]	0.085 [0.087]
Control	−9.83% [−10.82%]	0.093 [0.091]	−8.46% [−10.64%]	0.098 [0.097]
t-statistic [*Z*-statistic] for difference between Treatment and Control	2.25** [1.82]*	2.16** [1.95]*	2.88*** [2.49]**	2.89*** [2.45]**
Observations	616	616	616	616

Panel B: Regression analysis of future performance

	ICW and PS samples		ICW and IYV samples		PS and IYV samples	
Dependent variable	Model 1 *2-Year BHAR* Coeff. (*t*-stat)	Model 2 *2-Year RNOA* Coeff. (*t*-stat)	Model 3 *2-Year BHAR* Coeff. (*t*-stat)	Model 4 *2-Year RNOA* Coeff. (*t*-stat)	Model 5 *2-Year BHAR* Coeff. (*t*-stat)	Model 6 *2-Year RNOA* Coeff. (*t*-stat)
Intercept	−0.048* (−1.85)	−0.062** (−2.03)	−0.052 (−1.10)	−0.080 (−1.62)	−0.077** (−2.19)	−0.054* (−1.92)
Acq_ICW	−0.005* (−1.95)	−0.034* (−1.90)	−0.008** (−2.47)	−0.012** (−2.07)		
Prior-RNOA		0.233*** (4.98)		0.231*** (3.82)		0.239*** (4.38)
PS-Indicator					−0.004* (−1.79)	−0.008* (−1.69)
Control variables	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)
Acq ICW characteristics	2.84 (0.00)	2.53 (0.00)	4.51 (0.00)	4.22 (0.00)	1.52 (0.09)	1.38 (0.15)
Acq characteristics	3.27 (0.00)	3.01 (0.00)	2.36 (0.03)	2.07 (0.05)	4.59 (0.00)	4.88 (0.00)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Matched-pair fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	616	616	616	616	616	616
Adj R^2	0.019	0.347	0.011	0.360	0.006	0.340

Notes: This table reports the acquirer's post-acquisition performance. Panel A reports the distribution of the acquirer's 2-year, post-acquisition performance. Panel B presents the results for the OLS regression of future performance; *t*-statistics are based on standard errors clustered by year (Gow et al. 2010; Petersen 2009), and ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively. Industry and yearly controls are included in all the models. *F*-statistics (*p*-values) of testing the joint significance of control variables within each group are reported. See Appendix 2 for variable definitions.

Future performance

We next examine post-acquisition performance. Hypothesis 3 predicts that ICW acquirers perform worse than non-ICW acquirers. To test this hypothesis, we evaluate the future (2-year) performance of the combined company.[19] Panel A of Table 7 reports the results of the univariate analysis. The average 2-year buy-and-hold abnormal returns (*BHAR*) are −11.69 percent, −9.83 percent, and −8.46 percent for ICW acquirers, PS-matched acquirers, and IYV-matched acquirers, respectively. The difference between ICW and PS-matched acquirers is significant at the 5 percent level, while that between ICW and IYV-matched acquirers is significant at the 1 percent level. We follow Oler (2008) and Oler and Picconi (2014) and analyze returns on net operating assets (*RNOA*) for the first two full years following the completion date. The results on post-merger *RNOA* are qualitatively the same as those on *BHAR*.

Panel B of Table 7 presents results based on a multivariate analysis of future performance controlling for various firm characteristics.[20] We continue to find a negative and significant coefficient on *Acq_ICW* across the first four models, indicating that the relatively poor future performance experienced by ICW acquirers is partly attributable to their internal control weaknesses. This evidence is consistent with ICW acquirers, suffering from poor financial accounting information, making suboptimal M&A decisions. In other words, announcement returns may not have fully impounded possible poor future performance. Alternatively, investors' expectations regarding potential synergies are not realized. A lower *RNOA* suggests that ICW acquirers perform poorly after M&As compared to non-ICW control samples.

In Models 5 and 6, we compare the two control samples and find negative and significant coefficients on *PS-Indicator*. These results suggest that the PS-matched control sample exhibits marginally worse future performance than the IYV-matched control sample. Comparing future performance with announcement returns (Table 5, panel B), we find that they mirror each other, suggesting that acquirers with similar propensities to have ICWs make poorer M&A decisions than IYV-matched acquirers.

In summary, we find that the disclosures on internal controls, mandated by SOX sections 302 and 404, are associated with announcement returns and future performance, even after controlling for various deal and firm characteristics. We also document that ICW acquirers pay larger premiums than IYV-matched acquirers.

Additional analysis and robustness tests

Remediation of ICWs

Prior research documents the potential benefit of ICW remediation on firm performance (Ogneva et al. 2007; Ashbaugh-Skaife et al. 2008 2009; Feng et al. 2009; Gordon and Wilford 2012). For example, Ashbaugh-Skaife et al. (2009) show that remediating previously disclosed ICWs could lower the cost of equity. Following this line of research, we examine whether firms that report that they have remediated ICWs from prior periods behave—

19. We calculate 24-month abnormal buy-and-hold portfolio returns adjusted for size and book-to-market cumulated from the end of the month in which the deal was completed. We follow Fama and French (1992, 1993) and Barber and Lyon (1997) to calculate size and book-to-market adjusted returns for each firm-year-deal observation. Size for year t is the market value of equity at the end of June of year t. The book-to-market value for year t is the book value of equity at the end of the fiscal year ending in $t-1$ divided by the market value of equity at December 31 of $t-1$. The cumulative abnormal returns are calculated only for the deals that were completed. We obtain similar results when we measure portfolio returns starting from the month after the deal was announced (not tabulated).

20. In Models 2, 4, and 6 of panel B (analysis of *RNOA*), we do not control for the *Acquirer ROA* as part of the acquirer characteristics because we include it in our core analysis.

and are perceived—similar to firms without ICWs. To do so, we first identify firms that reported the remediation of ICWs in their most recent 10-Q or 10-K reports before the M&A announcement dates. We identify 161 such acquirers.[21] We pool these 161 acquirers with 381 acquirers from each of the three samples, forming three sets of 542 acquirers.

The regression results for *Premium* and *Acquirer CAR* are reported in Table 8, panel A. Acquirers that remediated their ICWs are identified with the indicator variable *Remediate-ICW*. Three sets of comparisons are made between acquirers that have remediated and

TABLE 8
ICW remediation

Panel A: Regression analysis of *Premium* and *CAR*

	ICW and Remediation samples		PS and Remediation samples		IYV and Remediation samples	
	Premium (%) Model 1 Coeff. (*t*-stat)	*Acquirer CAR (0,+1)* Model 2 Coeff. (*t*-stat)	*Premium (%)* Model 3 Coeff. (*t*-stat)	*Acquirer CAR (0,+1)* Model 4 Coeff. (*t*-stat)	*Premium (%)* Model 5 Coeff. (*t*-stat)	*Acquirer CAR (0,+1)* Model 6 Coeff. (*t*-stat)
Intercept	0.285**	0.071***	0.256***	0.074***	0.271***	0.078***
	(2.21)	(3.08)	(2.66)	(3.16)	(3.58)	(3.62)
Remediate-ICW	−0.019**	0.002**	−0.006*	−0.001	0.001	−0.001
	(−2.32)	(1.98)	(−1.70)	(−0.58)	(0.21)	(−0.80)
Premium (%)		−0.009**		−0.010***		−0.015**
		(−2.25)		(−2.61)		(−2.23)
Remediate-ICW × *Premium (%)*		0.003*		0.001		−0.001
		(1.85)		(0.37)		(−0.75)
Control variables	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)
Deal characteristics	1.41	1.86	2.14	2.63	2.01	2.25
	(0.17)	(0.05)	(0.02)	(0.00)	(0.03)	(0.01)
Acq ICW characteristics	3.27	4.66	1.06	1.43	1.27	1.61
	(0.00)	(0.00)	(0.39)	(0.16)	(0.24)	(0.10)
Acq characteristics	1.33	2.10	1.52	2.29	1.63	2.47
	(0.24)	(0.05)	(0.16)	(0.03)	(0.13)	(0.02)
Tar characteristics	5.10	2.89	5.36	2.17	4.68	2.34
	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.03)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Matched-pair fixed effects	No	No	No	No	No	No
Observations	542	542	542	542	542	542
Adj R^2	0.073	0.029	0.062	0.022	0.065	0.025

(The table is continued on the next page.)

21. As described in the sample selection procedure in Table 1, we remove these acquirers before we form our treatment and two-matched control samples.

TABLE 8 (continued)

Panel B: Regression analysis of future performance

	ICW and Remediation samples		PS and Remediation samples		IYV and Remediation samples	
	2-Year BHAR Model 1 Coeff. (*t*-stat)	*2-Year RNOA* Model 2 Coeff. (*t*-stat)	*2-Year BHAR* Model 3 Coeff. (*t*-stat)	*2-Year RNOA* Model 4 Coeff. (*t*-stat)	*2-Year BHAR* Model 5 Coeff. (*t*-stat)	*2-Year RNOA* Model 6 Coeff. (*t*-stat)
Intercept	−0.068*	−0.091**	−0.039	−0.061**	−0.059*	−0.064
	(−1.71)	(−2.16)	(−0.91)	(−2.49)	(−1.81)	(−2.16)
Remediate-ICW	0.009*	0.007**	0.005*	0.006**	-0.001	0.002
	(1.89)	(2.52)	(1.70)	(2.12)	(-0.11)	(1.35)
Prior-RNOA		0.210***		0.246***		0.268***
		(3.91)		(4.15)		(3.69)
Control variables	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)	*F*-stat (*p*-value)
Acq ICW characteristic	3.06	2.91	2.05	1.88	1.74	1.38
	(0.00)	(0.00)	(0.02)	(0.03)	(0.05)	(0.17)
Acq characteristic	7.10	5.89	7.39	6.93	7.19	6.75
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Matched-pair fixed effects	No	No	No	No	No	No
Observations	460	460	460	460	460	460
Adj R^2	0.009	0.338	0.010	0.319	0.007	0.281

Notes: This table presents the OLS regression analysis of *Premium*, *CAR* (panel A), *2-Year BHAR,* and *2-Year RNOA* (panel B) for a sample of firms that remediated their ICWs before the acquisition announcements pooled with ICW, PS-matched, or IYV-matched acquirers; *t*-statistics are based on standard errors clustered by year (Gow et al. 2010; Petersen 2009), and ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively. Industry and year fixed effects are included in all the models. *F*-statistics (*p*-values) of testing the joint significance of control variables within each group are reported. See Appendix 2 for variable definitions.

(i) ICW acquirers (Models 1 and 2); (ii) PS-matched acquirers (Models 2 and 3); and (iii) IYV-matched acquirers (Models 5 and 6).[22] We first discuss the results for *Premium*. The coefficient estimates of *Remediate-ICW* are −0.019 (*t*-statistic = −2.32), −0.006 (*t*-statistic = −1.70), and 0.001 (*t*-statistic = 0.21) when we compare remediation firms with ICW, PS-matched, and IYV-matched acquirers, respectively. These estimates suggest that, in terms of merger premiums paid, acquirers that remediated ICWs pay less than ICW and PS-matched acquirers but pay similar premiums as IYV-matched acquirers. The analysis of *Acquirer CAR* shows a significant difference between acquirers that remediated and those that did not, but no statistical difference between acquirers that have remediated and IYV-matched firms, indicating that the market does not penalize acquirers that had to remedy ICWs. To further investigate whether the market perceives remediating firms as overpaying, we include the interaction term *Remediate-ICW* × *Premium (%)*. The

22. IYV-matched acquirers have effective internal controls for at least 2 years before acquisition announcements.

coefficient on this interaction term is positive and significant relative to ICW acquirers (coefficient = 0.003, *t*-statistic = 1.85), but insignificant relative to both groups of matched acquirers. This evidence suggests that the market does not punish acquirers that remediated ICWs as much as acquirers that currently suffer from ICWs.

Favorable market perception of remediation acquirers continues over the 2 years after merger announcements. Panel B of Table 8 reports the future performance of our four samples. Both Models 1 and 3 show that the coefficient on *Remediate-ICW* is positive and significant, indicating buy-and-hold abnormal returns over the 2-year period are significantly higher for remediation acquirers than either ICW or PS-matched acquirers. Similar to the announcement returns, however, Model 5 shows that there is no statistical difference in *BHAR* between remediation acquirers and IYV-matched acquirers. The results on *RNOA,* reported for Models 2, 4, and 6, support the market's assessment of these acquirers. Even after controlling for the prior-year *RNOA*, remediation acquirers have a higher *2-Year RNOA* than both ICW and PS-matched acquirers, but lower than IYV-matched acquirers.

Robustness tests

We also conduct a number of tests (untabulated) to check the robustness of our main results. First, we examine alternative announcement return measures. In addition to the market-adjusted returns, we use raw returns, size-adjusted returns, and value-weighted-index-adjusted returns. We find that the choice of return measures does not affect our results. We also examine whether our results depend on the length of the window used to estimate the stock returns, using longer windows (3 and 5 days). The results are qualitatively the same as those reported for the 2-day announcement returns.

Second, we examine the extent to which the source of ICW disclosures (section 302 or 404) influences the market reactions by including an indicator variable for section 302 in the regression when the deal announcement year is 2003 or 2004. The coefficient on the indicator is not statistically significant, and there is no material effect on the rest of the results. We also reestimate our models after dropping firms that are non-accelerated filers (see below).

Third, to assess the possibility that some acquirers are habitually bad acquirers, for each bidder, we delete all subsequent acquisitions except for the first acquisition in the 2 years after their ICW disclosures. The results for premiums, announcement returns, and long-term performance are qualitatively the same. In addition, we use an indicator variable that equals one for firms that made acquisitions in the 2 years before the current acquisition. We again find that our results are robust. We believe the above analyses mitigate the concern that the more negative CARs among ICW-acquirers could simply reflect a bad M&A track record.

Finally, to ensure that our results are not biased by our sample selection, we drop (i) five (three) acquirers that are non-accelerated filers from our PS- (IYV-) control samples; (ii) targets that are non-accelerated filers from our treatment (nine) and control samples (13 from PS-matched and eight from IYV-matched samples); and (iii) withdrawn deals from our treatment and control sample. Our inferences hold.

6. Conclusions

Our empirical results suggest that disclosures required by SOX sections 302 and 404 are informative in the market for corporate control. Acquisition of another firm is fraught with risk. Many empirical studies have shown the difficulty of implementing successful acquisitions. Our study contributes to this literature by focusing on the question of whether ineffective internal controls affect the market for corporate control. We find that acquirers that report ICWs experience a more negative market response to acquisition announcements and, subsequently, perform worse than acquirers that do not report ICWs.

Our results on the acquisition premiums paid to targets suggest that while ICW acquirers pay larger acquisition premiums than IYV-matched acquirers, no statistical difference exists in the premiums paid by ICW and PS-matched acquirers. Non-ICW acquirers with similar propensity scores pay similar premiums, suggesting that they also make poor M&A decisions. This could be due to having similar characteristics that are associated with ineffective internal controls or to low-quality information generated by weak internal controls.

Market reactions to acquisition announcements are more negative for ICW acquirers than for PS- and IYV-matched acquirers, suggesting that the market relies on ICW disclosures. Operating performance over the 2 years after announcements largely bears out investors' initial assessment of these mergers. Yet future stock performance suggests that the stock market may have underreacted to the disclosures. While our results on premium suggest that PS-matched acquirers are likely to have similar information problems as ICW acquirers, the market does not fully discount acquisitions by PS-matched acquirers, suggesting that investors pay more attention to disclosures than observable firm characteristics associated with ICWs.

Our acquisition return and future performance test results suggest that disclosures mandated by sections 302 and 404 are useful in evaluating M&A deals. Acquirers without ICWs appear to be using better information to value their targets and the potential synergies from acquisitions. Overall, our results suggest that ineffective internal controls hinder managerial decision making related to M&A, and investors appear to partially understand this effect, although the incrementally negative future-abnormal stock returns among ICW acquirers suggest their impounding of information is not complete.

Appendix 1

Propensity score matching

TABLE A1
Propensity score matching model

Panel A: Logit model used to estimate propensity scores	
Dependent variable: *Acq_ICW*	
Intercept	−0.931**
	(−2.25)
Acq High Segments	0.528**
	(2.11)
Acq Foreign Currency	0.499***
	(3.87)
Acq Restructure	0.181
	(0.15)
Acq Salegrw	0.839***
	(2.89)
Acq High Inventory	1.200***
	(3.70)
Acq High MktV	−1.934***
	(−3.81)
Acq Loss	0.136**
	(2.39)

(The Appendix is continued on the next page.)

Appendix 1 (continued)

Panel A: Logit model used to estimate propensity scores

Dependent variable: *Acq_ICW*	
Acq High Zscore	−0.122
	(−0.55)
Acq High Age	−0.398
	(−0.88)
Acq Prior Restate	0.873**
	(6.49)
Acq Big 4	−0.315***
	(−2.82)
Acq High Audit Fees	0.426**
	(1.98)
Acq High Non-Audit Fees	−0.049
	(−1.38)
Acq Auditor Change	0.185
	(1.12)
Acq Mgt Change	0.161***
	(3.69)
Industry indicators	Yes
Year indicators	Yes
N for *Acq_ICW* = 1	381
Total *N*	4,898
ROC curve	0.8193
Likelihood ratio x^2	292.252
(*p*-value)	(0.001)

Panel B: Estimated propensity score distributions of the ICW and the PS-matched samples

	Obs.	Min	P50	Mean	Max
ICW sample	381	0.073	0.609	0.600	0.943
PS-matched sample	381	0.070	0.602	0.588	0.934
Difference		0.003	0.007	0.012	0.009

Panel C: Estimated propensity score distributions of the ICW and the IVY-matched samples

	Obs.	Min	P50	Mean	Max
ICW sample	381	0.073	0.609	0.600	0.943
IYV-matched sample	381	0.030	0.467	0.503	0.933
Difference		0.043***	0.142***	0.097***	0.010*

Notes: Panel A presents parameter estimates from the logit model used in estimating the propensity scores for the treatment and the control samples. The dependent variable is one if the acquirer firm disclosed one or more ICWs before the acquisition and zero otherwise. Panel B (panel C) reports the distribution of estimated propensity scores for the treatment sample, the PS-matched control sample (the IYV-matched control sample), and the difference in estimated propensity scores. *z*-statistics are reported in parentheses. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

Appendix 2

Variable definitions

ICW control variables	Definition
Log Segments	Logarithm of the number of business segments reported in COMPUSTAT segment file for fiscal year before the acquisition announcement
High Segments	Indicator variable equal to one if *Log Segments* is in the top quintile and zero otherwise
Foreign Currency	Indicator variable equal to one if the firm has a nonzero foreign currency translation (FCA) in the fiscal year before the acquisition announcement and zero otherwise
Restructure	Indicator variable equal to one if at least one of COMPUSTAT annual data items (RCP, RCA, RCEPS, or RCD) is not equal to zero for any fiscal year in the 3 years before the acquisition announcement and zero otherwise
Salegrw	Indicator variable equal to one if industry-adjusted growth in sales (SALE) falls into the top quintile in fiscal year before the acquisition announcement and zero otherwise
Inventory	Inventory (INVT) over total assets (AT)
High Inventory	Indicator variable equal to one if *Inventory* is in the top quintile and zero otherwise
Log MktV	Logarithm of market value of equity, where the market value of equity is equal to price per share (PRCC_C) multiplied by the number of shares outstanding (CSHO) at the end of the fiscal year before the acquisition announcement
High MktV	Indicator variable equal to one if *Log MktV* is in the top quintile and zero otherwise
Loss	Indicator variable equal to one if earnings before extraordinary items (IB) in the fiscal year before the acquisition announcement are negative and zero otherwise
RZscore	Decreasing decile rank of Altman's (1968) Z-Score; we use decreasing ranks so that larger values indicate higher bankruptcy probabilities
High Zscore	Indicator variable equal to one if *RZscore* is in the top quintile and zero otherwise
Log Age	Logarithm of the number of years the firm exists in the CRSP database
High Age	Indicator variable equal to one if *Log Age* is in the top quintile and zero otherwise
Prior Restate	Indicator variable equal to one if the firm had any restatements in the 3 years before the acquisition announcement (from Audit Analytics) and zero otherwise
Big 4	Indicator variable equal to one if the firm is a client of a Big 4 auditing firm (from Audit Analytics) and zero otherwise
Audit Fees	Total audit fees paid by the firm in the year before the acquisition (from Audit Analytics), scaled by the square root of total assets
High Audit Fees	Indicator variable equal to one if *Audit Fees* is in the top quintile and zero otherwise
Non-Audit Fees	Total nonaudit fees paid by the firm in the year before the acquisition (from Audit Analytics), scaled by the square root of total assets

(The Appendix is continued on the next page.)

Appendix 2 (continued)

ICW control variables	Definition
High Non-Audit Fees	Indicator variable equal to one if *Non-Audit* is in the top quintile and zero otherwise
Auditor Change	Indicator variable equal to one if the firm experienced an auditor change in the 2 years before the deal announcement (from Audit Analytics) and zero otherwise
Mgt Change	Indicator variable equal to one if the firm experienced a CEO or CFO change in the 2 years before the deal announcement (from Audit Analytics) and zero otherwise
Firm characteristics	
Book-to-Market	Book value of total assets minus total liabilities divided by stock's market value of equity (CEQ/CSHO × PRCC_F)
ROA	Return on assets (IB/AT)
Leverage	Total debt divided by total assets ((DLTT + DLC)/AT)
Regulated Industry	Indicator variable equal to one if the firm is in a regulated industry—i.e., SIC codes 4812–4813, 4833, 4841, 4811–4899, 4922–4924, 4931, or 4941—and zero otherwise
Financial Industry	Indicator variable equal to one if the firm is in the financial sector—SIC codes 6000–6999—and zero otherwise
Litigation Firm	Indicator variable equal to one if a firm is in a litigious industry—SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, or 7370—and zero otherwise
E-Index	Index of shareholder rights defined by Bebchuk et al. (2009)
Deal characteristics	
Termination Fee	Indicator variable equal to one if the merger agreement includes a termination fee granted by the bidder and zero otherwise
Deal Lockup	Indicator variable equal to one if the deal includes a lock-up agreement involving target equity and zero otherwise
Number of Bidders	Number of bidders competing to acquire the target (from SDC)
Entirely Cash Deal	Indicator variable equal to one when the transaction is financed 100 percent with cash (from SDC) and zero otherwise
Stock Percentage	Percentage of the transaction financed with common stock (from SDC)
Tender Offer	Indicator variable equal to one when the deal is a tender offer identified by SDC and zero otherwise
Bidder Toehold	Percentage held by the acquirer before the current deal
Hostile Deal	Indicator variable equal to one when SDC classifies a bid as hostile and zero otherwise
Number of Investment Banks	Number of investment bankers identified by SDC
Same Industry	Indicator variable equal to one if the merging partners are in the same 2-digit SIC code and zero otherwise
Other variables	
Acq_ICW	Indicator variable equal to one when the acquirer reported ICWs in the fiscal year prior to the deal announcement and zero otherwise
Log(1 + Num Acq Weaknesses)	Natural logarithm of one plus the number of material weaknesses disclosed by the acquirer in its 10-Q or10-K report
PS-Indicator	Indicator variable equal to one when the observation is in the propensity score matched control sample and zero otherwise

(The Appendix is continued on the next page.)

Appendix 2 (continued)

ICW control variables	Definition
Remediate-ICW	Indicator variable equal to one if an acquirer reports in the most recent 10-K that they remediated ICWs during the last fiscal year before the acquisition announcement and zero otherwise
Premium (%)	((Offer price/Target stock price 42 days before announcement) − 1) × 100
Premium ($)	Calculated as the *Premium (%)* × Target Equity Value × percent of stock bought in the deal
EBITDA/Deal Value	Accounting-based premium calculated as the ratio of target's EBITDA to deal value. *EBITDA* is earnings before interest, taxes, depreciation, and amortization (OIBDP)
Sales/Deal Value	Accounting-based premium calculated as the ratio of *Sales* to *Deal Value*
CAR (0,+1)	Cumulative market adjusted return over the 2 days spanning day 0 to day +1, where day 0 is the merger announcement date. We also report *CAR* adjusted-for-toehold for the acquirers that already owned some shares (< 50 percent) of the target
2-Year BHAR	Acquirer's buy-and-hold abnormal returns over the 24 months following the SDC deal completion date minus the average *BHAR* accumulated over the same window of the peer portfolio (matched by size and book-to-market)
2-Year RNOA	Average return on net operating assets for the first two full years following the acquisition completion date. *RNOA* is calculated, per Nissim and Penman (2001), as operating income after depreciation (OIADP) divided by net operating assets ((AT − IVAO) − (AT − DLTT − DLC − CEQ − PSTK − MIB)). To avoid losing observations, we use only the first year following the acquisition when the second year is missing. In addition, we replace missing values for DLC, PSTK, and MIB with zeros
Prior-RNOA	Acquirer average return on net operating assets for the two full years before the acquisition. To avoid losing observations, we use only 1 year before the acquisition, when the second year is missing. *RNOA* is calculated as by Nissim and Penman (2001)
Deal Value	Value in millions of dollars of the M&A deal (from SDC)

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