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# The Role of Accounting Quality in the M&A Market

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**W**e examine the role of target firms' accounting quality in the merger and acquisition process. We predict that target firm accounting quality will be positively associated with (1) the likelihood that the deal will be structured as a negotiation rather than as an auction, (2) the speed with which the deal reaches final resolution, and (3) the likelihood that the proposed deal is ultimately completed. Our empirical evidence is consistent with these predictions. These results complement and extend existing findings on target firm accounting quality and provide new evidence that financial accounting quality relates positively to the efficient allocation of the economy's capital resources.

*Keywords:* mergers and acquisitions; auctions; negotiations; accounting quality

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## 1. Introduction

We examine the role of target firms' accounting quality in the merger and acquisition (M&A) market. We are especially interested in how accounting quality is related to the target and bidder decisions that comprise the M&A process. In particular, we examine whether accounting quality is linked to the choice of sales method, the length of the M&A process, and the decision to complete or terminate a proposed deal. Our empirical evidence suggests that target firm accounting quality is significantly associated with all three elements of the M&A process.

We take a chronological approach and begin our analysis by first examining how target firm accounting quality is associated with the initial decision to conduct the transaction via auction versus negotiation. The relative quality of accounting information is likely to play a role in the choice of sales method, as auction theory suggests that assets with more uncertainty about their "true" value are more likely to be sold via auctions than through other sales methods because uncertainty tends to increase the expected value of the winning bid (French and McCormick 1984). High-quality accounting information also reduces the costs of negotiation because it helps in identifying the bidder that values the target firm most highly. We therefore predict that target firm accounting quality will be negatively (positively) associated with the likelihood of an auction (negotiation).

Because the method of sale potentially has important ramifications for the direction and ultimate out-

come of the M&A process, we condition our subsequent analyses on the auction-versus-negotiation dichotomy. Our second test examines how accounting quality relates to the speed of the M&A process. In particular, we are interested in the role that accounting quality plays in the due diligence phase of a deal, because the review of financial statements is considered the "single most important aspect of due diligence" (Lajoux and Elson 2000). We expect high-quality accounting information to reduce the amount of time required for due diligence, thereby reducing the length of the M&A process overall; we therefore predict that target firm accounting quality is negatively associated with the length of the M&A process. In addition, because relatively more due diligence work occurs after the merger agreement is publicly announced in the case of auctions, we predict that the negative association between target firm accounting quality and the length of the postannouncement phase of the deal is stronger in the case of auctions.

Last, we examine the association of accounting quality with the likelihood that the transaction will be completed, as many merger agreements are terminated after their public announcement. In fact, Bates and Lemmon (2003) report that 21% of announced deals are ultimately terminated, and Securities Data Corporation (SDC) reports an almost identical termination rate. We predict that target firm accounting quality will be positively associated with the likelihood that the deal will be completed, because it is less likely that new information about the "true" value of

the target firm will emerge between the announcement and completion dates of the transaction when accounting quality is high. Conditional on the method of sale, however, we expect that target firm accounting quality will have a stronger association with the likelihood of completion in auctions versus negotiations because relatively more of the due diligence work that could potentially reveal new information occurs after the deal is publicly announced in the case of auctions.

It is important to note that these hypotheses are not contingent on the presence of managerial opportunism with regard to financial reporting—i.e., we expect an association between target firm accounting quality and the course of the M&A process regardless of whether managers deliberately manage earnings in a particular direction. We therefore use the Dechow and Dichev (2002) unsigned measure of accruals quality (AQ) as our primary proxy for accounting quality. This measure reflects both intentional and unintentional mismatching between current accruals and past, current, and future cash flows, making it an especially appropriate choice in our decision context.

Using the Dechow and Dichev (2002) AQ measure, we report empirical results consistent with our expectations. Target firm AQ is strongly negatively (positively) associated with the likelihood that the transaction will be conducted via an auction (negotiation). In addition, because recent findings reveal that target firms tend to prefer auctions, whereas bidders favor negotiations (Bulow and Klemperer 2009), we perform further tests to determine whether our findings on sales method choice are sensitive to deal initiation. We find that target firm AQ is negatively associated with the use of auctions for both target-initiated and bidder-initiated deals, though the association is significantly stronger for deals initiated by the target firm.

We further find that accounting quality is significantly related to the speed of the M&A process. In particular, we find that the time required to reach a final resolution is negatively associated with target firm AQ for both auctions and negotiations, though only significantly so in the preannouncement phase of the deal. Finally, we find that the likelihood of deal completion is also positively associated with AQ for our full sample of M&A transactions, but the association is stronger for auctions than for negotiations. This latter finding is consistent with the importance of financial reporting choices in the due diligence process that typically follows the merger announcement in the case of auctions.

Although our hypotheses are not conditional on the source of accounting quality, these findings nonetheless raise the issue of whether accounting quality can be clearly distinguished from “innate” firm characteristics that may be associated with it. As observed by

Dechow et al. (2010), the quality of the firm’s earnings depends on *both* the firm’s fundamental performance and on the accounting system that measures it. This difficulty is also recognized by financial executives, who ascribe roughly 50% of accounting quality to nondiscretionary factors and the remainder to poor accounting standards and estimation errors, with perhaps 10% stemming from intentional earnings manipulation (see Dichev et al. 2013). Managers thus have influence over accounting quality, but intrinsic factors such as industry, macroeconomic conditions, and operating strategies also play prominent roles. The measure AQ reflects both of these components of accounting quality.

Although the problem of developing a model of accounting quality that definitively separates reported earnings from fundamental performance may never be “solved” per se because the latter is unobservable (DeFond 2010), some empirical proxies for accounting quality are relatively less intertwined with firms’ innate factors than others. In particular, an alternative measure of accounting quality based on unexplained audit fees (UAF) developed by Hribar et al. (2014) has been shown to be less correlated with firms’ operating risk than other currently available proxies. In addition, as with the AQ measure, UAF offers the advantage that it cannot be easily manipulated by managers. We repeat the above analyses using UAF and report similar findings. However, we observe somewhat stronger associations between AQ and sales method choice than for UAF, which may indicate that uncertainty regarding the firm’s “fundamental performance” may be the driver for this result. In contrast, UAF appears to be more strongly associated with the speed of deal resolution and the likelihood of deal completion, consistent with the increased relevance of due diligence in these phases of the M&A process and that UAF is more apt to reflect differences in how well accounting systems measure firm performance than firm performance itself. We strongly caution, however, that no extant model currently offers a clear-cut distinction between these two components of earnings quality, and the empirical results should be interpreted with this caveat in mind.

In sum, our results suggest that M&A transactions involving target firms with poor accounting quality are generally associated with a more costly and inefficient process than transactions involving targets with higher accounting quality. Targets with poor accounting quality are more likely to be sold via auction, and the direct and indirect costs of organizing an auction typically exceed those of negotiations (Boone and Mulherin 2007, Aktas et al. 2010).<sup>1</sup> M&A transactions

<sup>1</sup> Bulow and Klemperer (2009) show that in the presence of entry costs, auctions are always inefficient relative to sequential negotiations.

involving targets with poor accounting quality also take longer to reach final resolution, thereby consuming more resources, and are more likely to be terminated after they are publicly announced, resulting in additional inefficiency.

These findings are broadly consistent with previous research linking accounting quality to investment efficiency. For example, Biddle and Hilary (2006) relate accounting quality to investment cash-flow sensitivity, implying that firms with poor accounting quality are more likely to rely on internally generated cash flows rather than external financing to fund investments, and Biddle et al. (2009) directly relate financial reporting quality to capital investment efficiency. McNichols and Stubben (2008) find that firms that manipulated earnings tend to overinvest during the misreporting period, and Francis and Martin (2010) find that firms with more conservative accounting practices make more profitable acquisitions. Overall, these findings suggest that accounting quality improves investment efficiency by reducing information problems. Our study extends this research stream by linking the poor accounting quality of target firms to frictions in the M&A market.

We also contribute to the developing literature on target firm earnings quality. First, we extend concurrent work by Raman et al. (2013), who find that target firm earnings quality is positively associated with hostile takeovers. We extend this finding by documenting a significant association between target firm accounting quality and the choice between an auction and a negotiation within the subset of “friendly” acquisitions, which comprise the overwhelming majority of M&A transactions. In addition, by further linking target firm accounting quality to the due diligence process, as measured using the length of time required for deal resolution, and to the likelihood of deal completion, our analysis also complements several recent papers that examine target firm accounting information and M&A returns (e.g., Shalev and Martin 2009, McNichols and Stubben 2012, Cain et al. 2013). By expanding our analysis beyond questions related to M&A wealth effects, we help to provide a more complete understanding of how target firm accounting quality relates to other important dimensions of the M&A market.

## 2. Background on M&A Sales Methods

Recent evidence presented by Boone and Mulherin (2007, 2008) reveals that the M&A market is far more competitive than previously thought, with roughly half of target firms auctioned among multiple bidders and the remainder negotiating with a single bidder. In this section, we briefly describe these two processes.

### 2.1. The Typical Auction

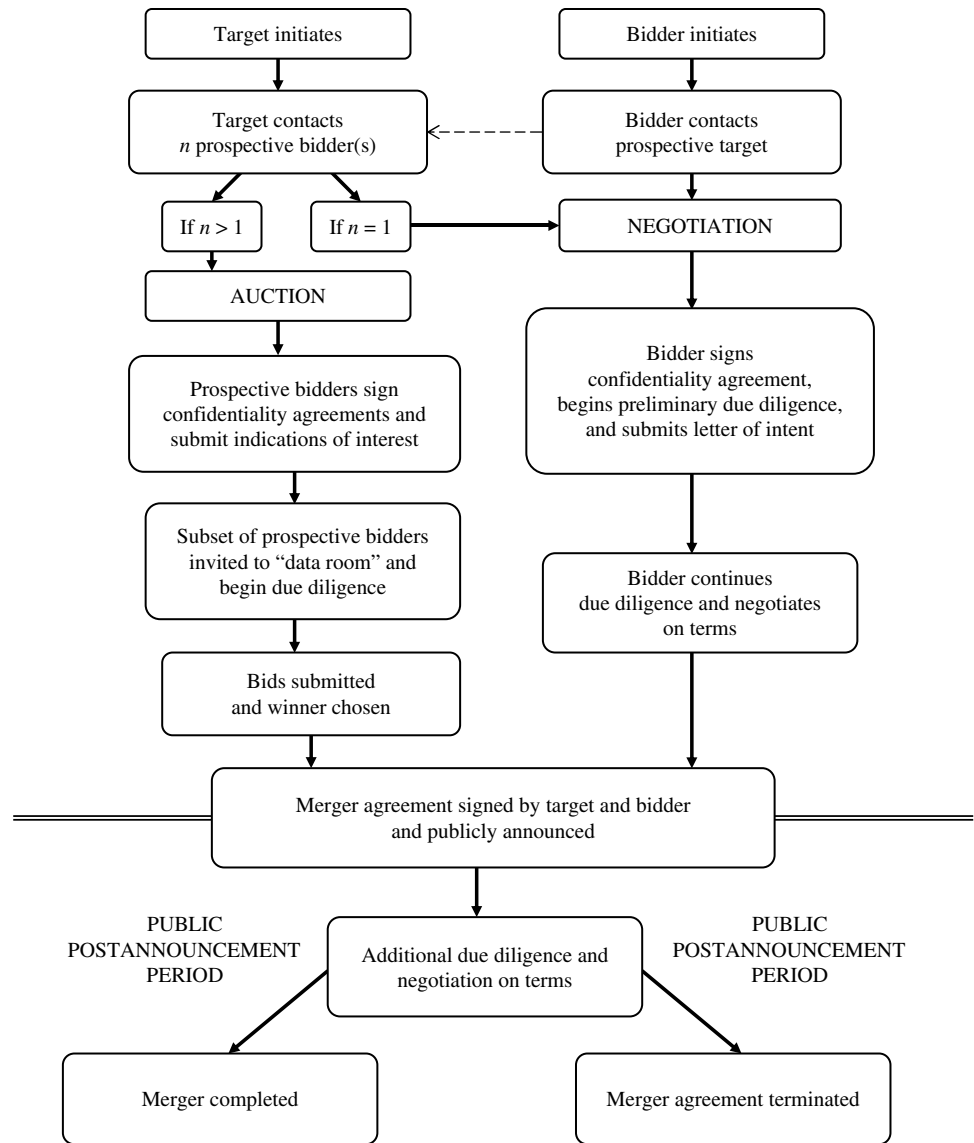
Hansen (2001) outlines the typical sequence of an M&A auction. The target firm (or its advisors) first draws up a list of potential bidders, which will include competitors, suppliers, customers, acquisition-oriented conglomerates, and leveraged buyout houses. Prospective bidders receive a very cursory description of the target firm and are offered more in-depth information if they sign a confidentiality agreement. Prospective bidders then submit preliminary, nonbinding “indications of interest” to the target, which includes an approximation or range of target values. A subset of these bidders are then invited to participate in the next step of the process, which involves more intensive dissemination of information, including presentations by senior management, plant and site visits, and review of financial, legal and other documents that are assembled by the target firm and its advisors in an off-site “data room.” It is important to note that although the information given to prospective bidders at this stage is extensive, it is chosen by the target firm and therefore not complete. For example, target firms will not reveal information viewed as advantageous to competitors or cost information that might threaten relations with suppliers or employees. In addition, the seller will limit the amount of time that a prospective bidder may spend reviewing the available data. Bidders then submit sealed bids for purchase of the target company. After the winning bid is chosen, the bidder and target then execute and sign the merger agreement, outlining the parameters of the deal. The merger agreement will also include “material adverse effect” (MAE) clauses, which allow a party to terminate the deal before closing if triggered. The merger is typically publicly announced at this time. A more thorough on-site due diligence review follows, along with negotiation on terms other than price, before the deal is ultimately completed (see Bruner 2004).

### 2.2. The Typical Negotiation

A negotiated M&A transaction typically begins with informal meetings between the target and bidder, which could be initiated by either party but is more commonly initiated by the bidder (Aktas et al. 2010). In contrast to the auction process, preliminary on-site due diligence may begin soon after both parties agree to explore the possibility of a business combination and a confidentiality agreement is signed. The bidder then prepares a letter of intent that summarizes the key elements of its interest in the target firm, including the basic structure of the transaction and the form and amount of consideration. Though most letters of intent are nonbinding, the bidder will often seek to create binding obligations for the target firm, such as “no shop” agreements that prohibit the



Figure 1 Typical M&A Processes



seller from negotiating with other parties for a specific period of time (Reed et al. 2007).<sup>2</sup> The letter of intent is typically executed after the bidder has completed its basic financial due diligence, but before it embarks on its major legal due diligence. After this more serious review is completed, the parties negotiate the key terms of the definitive merger agreement. In addition to the price paid, key issues include the scope of representations and warranties, definitions of MAEs, restrictions on the target's ability to respond to unsolicited takeover proposals, terminations provisions and fees, obligations for payment of expenses,

employee benefit issues, and recourse for breach of the agreement. After the merger agreement is authorized by the board, the deal is publicly announced, though additional due diligence may occur prior to final deal resolution.

Figure 1 presents typical auction and negotiation processes schematically. As reflected in Figure 1, target firms most often initiate auctions, but bidders may indirectly initiate an auction if the prospective target decides to contact additional prospective bidders after the initial approach by the original bidder. Negotiations involving a single bidder may be initiated by either party, as indicated in Figure 1, but tend to be more frequently initiated by the bidder. The two processes converge when the merger agreement is signed and publicly announced.

<sup>2</sup> The letter of intent typically submitted in a negotiation contrasts with the less detailed "indications of interest" submitted by prospective bidders in an auction process. Indications of interest also differ from letter of intent in that they do not request exclusivity from the target firm.

### 3. Hypothesis Development

#### 3.1. Accounting Quality and the Method of Sale

Our first research question deals with target firm accounting quality and the choice of sales method in corporate M&A transactions. Because there is evidence suggesting that targets and bidders have different preferences regarding sales method choice, with targets usually preferring auctions and bidders generally opting for negotiations, we develop our first hypothesis from both target and bidder perspectives.<sup>3</sup>

**3.1.1. Target-Initiated Deals.** Drawing on previous research on auction theory, we argue that target firms with low-quality accounting information are more likely to initiate a sale via auction than through a negotiated sale. French and McCormick (1984) provide the economic intuition behind this prediction, which we briefly summarize as follows. Suppose that the value of an asset varies across potential users, as is typically the case with a target firm in a corporate acquisition. In a first price sealed bid auction, more bidders increase the expected winning bid because, ceteris paribus, additional bidders increase the probability that there is a bidder who has placed a particularly high value on the asset offered for sale.<sup>4</sup>

We now consider the role of accounting quality in this setting. If the value of the asset (i.e., the target firm) is more difficult to estimate and varies widely across potential bidders, such as when target firm accounting quality is poor, the selling shareholders benefit to a greater extent from additional bids because, ceteris paribus, the expected winning bid will be higher when there is greater variation in target firm values across potential bidders. We therefore expect that target firms are more likely to be sold via auction when accounting quality is low.

In contrast, when the target firm's value is more easily estimated and varies to a lesser extent across potential bidders, such as when target firm accounting quality is high, there is little to gain from having many bids on the target firm. In this case, the target would likely prefer a negotiated sale with a single bidder, as long as negotiation costs are sufficiently low. One risk associated with a negotiated sale

is the possibility that the bidder chosen by the target does not place the highest possible value on the target's shares. Similarly, if the bidder has some information about the value of the target's shares that is not available to the target's shareholders, such as the identification of potential synergies with the bidder, the target's shareholders may not be able to capture the full amount of the target's value. However, when these negotiation costs are low, i.e., when there is not much uncertainty regarding the target firm's value across potential bidders, or if the target's shareholders can easily determine ex ante which bidder would value the target firm most highly, then the target is more likely to choose a negotiated sale over auction. Because we expect that firms with high accounting quality face lower negotiation costs and accrue fewer benefits from an auction process than firms with low accounting quality, we expect that target firms are more likely to be sold via a negotiation process when accounting quality is high.<sup>5</sup>

Since a successful auction typically requires the willing participation of both target and bidder, we now turn our attention to the bidder's decision to participate in an auction initiated by the target firm. Auction theory has established that bidders will participate in an auction whenever their expected profits exceed the bid preparation costs (French and McCormick 1984, McAfee and McMillan 1987, Bulow and Klemperer 2009), and empirically we observe that roughly half of takeovers involve multiple bidders. Thus, although potential bidders might prefer to negotiate with a single firm than participate in an auction, once the target has initiated an auction process, an individual bidder's preference is likely to have little effect on the sales method choice of the target firm.

**3.1.2. Bidder-Initiated Deals.** We now consider the case in which the bidder initiates a potential merger or acquisition. Bulow and Klemperer (2009) compare the two dominant methods for selling public companies—the simultaneous auction versus the

<sup>3</sup> Anecdotal evidence suggests that, as a general rule, bidders prefer to avoid auctions when possible. For example, in a survey of private equity firms, 90% of firms said they do not like to participate in auctions. However, 80% of these same firms said that they prefer an auction process when they sell businesses (see *Mergers and Acquisitions* 2006). Bulow and Klemperer (2009) provide theoretical support for these observed preferences and conclude that sellers generally prefer auctions, and DeBodt et al. (2012), Aktas et al. (2010), and Xie (2010) all report empirical evidence consistent with this pattern.

<sup>4</sup> Bruner (2004) states that most M&A auctions use a first price sealed bid process.

<sup>5</sup> Our expectations regarding the sales methods of target firms are also consistent with Bulow and Klemperer (2009), who show analytically that sellers typically prefer a simultaneous auction over a sequential sales mechanism (i.e., negotiating with a single bidder at a time). Because auctions are conducive to entry, they usually generate higher expected revenue for the seller. In addition, the competition created by the auction "allows the seller to do well independently of any knowledge of bidder values" (Bulow and Klemperer 2009, p. 1546). However, if the seller has enough information power regarding bidder values, it can run a sequential procedure that can increase expected revenues relative to an auction process by charging optimal entrance fees and subsidies. This implies that targets will prefer auctions unless accounting quality is high enough to permit sufficient knowledge to optimally set subsidies in the sequential mechanism setting. This again suggests that target firms with low (high) accounting quality are more likely to initiate a sale via auction (negotiation).

sequential sales mechanism, in which sellers negotiate with one buyer at a time. They find that bidders typically prefer sequential sales mechanisms because bidders capture the extra rents created by the sequential mechanism. In particular, the ability to make preemptive bids, as is common in the market for corporate control, overdeters entry by other bidders relative to the social optimum, which transfers rents to the buyer. These findings are consistent with recent empirical evidence presented by Aktas et al. (2010), Xie (2010), and DeBodt et al. (2012), who find that negotiations are most often initiated by bidders.

However, a successful negotiation typically requires the cooperation of the seller, so we must consider the likely responses of the target firm shareholders once the bidder has initiated a negotiation.<sup>6</sup> If the value of the target firm is difficult to determine, as when accounting quality is poor, target firm shareholders are likely to respond by opening up the process to additional bidders because the likelihood of identifying a new bidder who might value the target firm more highly than the original initiator of the negotiation is higher in this instance (this possibility is indicated in Figure 1 as the dashed line connecting the bidder's initial contact with a prospective target to the target contacting additional bidders).<sup>7</sup> In contrast, if the target firm's value is more obvious to all parties, as when accounting quality is high, there is less to be gained by going to auction, and target firm shareholders are more likely to agree to negotiate with a single bidder.

In sum, our expectations regarding the relationship between target firm accounting quality and method of sale are not conditional whether the transaction is initiated by the target or by the bidder. Our first hypothesis is therefore as follows:

**HYPOTHESIS 1 (H1).** *Target firm accounting quality is negatively associated with the likelihood that M&A transactions will be conducted via an auction versus a negotiation, ceteris paribus.*

### 3.2. Accounting Quality and the Speed of the M&A Process

Our second research question explores whether target firm accounting quality influences the speed of the M&A process. Our particular focus is on the role of accounting quality in the due diligence process.

<sup>6</sup> Hostile takeovers do not require cooperation between target and bidder; we omit these deals from our analysis.

<sup>7</sup> Mazzone (2011) observes that bidders who approach sellers may attempt to prevent this outcome by threatening to boycott any auction process run by the seller. However, even if the original initiator of the deal does not remain in the subsequent auction, other bidders should rationally participate if the expected profit from the acquisition exceeds their bid preparation costs.

Lajoux and Elson (2000, p. 35) argue that the review of financial statements is the "single most important aspect of due diligence" and further add that an effective review must go beyond the reported numbers themselves to include an assessment of financial reporting quality. They recommend that bidders be especially alert to "red flags" that might suggest that the target firm has misrepresented its financial statements, such as shifting revenues or expenses between current and future periods, increasing income through one-time gains, or using unusual accounting methods.

Reed et al. (2007) note that the due diligence process may last from a few weeks to a year or more. However, Lajoux and Elson (2000, p. 20) observe that "speedy due diligence ensures minimal disruption to ongoing business activities and minimization of out-of-pocket costs to both parties," and is therefore economically valuable to both target and bidder. We assume that a longer due diligence process will tend to increase the length of time it takes to reach resolution on the transaction. If target accounting quality is useful in the due diligence process, then we expect it to be negatively associated with the length of time between the initial discussion of the proposed transaction and the merger announcement in the preannouncement phase, as well as length of time required to reach final resolution of the proposed deal (either completion or termination) in the postannouncement phase. Stated formally:

**HYPOTHESIS 2A (H2A).** *Target firm accounting quality is negatively associated with the length of time required for the M&A process, ceteris paribus.*

Conditional on the method of sale, however, we expect that AQ will be more relevant in the case of auctions in the postannouncement phase of the transaction. As we described in §2, in the case of a negotiated sale, relatively more of the due diligence required by the bidder typically occurs *before* the acquisition agreement is publicly announced (see Figure 1). In contrast, bidders in an auction have only limited access to the target firm's private information prior to the sale (see Hansen 2001), and the winning bidder proceeds with a more thorough review of the target firm *after* the merger agreement is announced (see Bruner 2004).<sup>8</sup> Given this institutional structure, we hypothesize the following:

**HYPOTHESIS 2B (H2B).** *Target firm accounting quality is more negatively associated with the length of time*

<sup>8</sup> Consistent with the higher risk associated with this sequencing of the due diligence process, we observe that the number of MAE exclusions listed in the merger agreement, which allow the bidder to walk away from the deal without penalty, is significantly greater for auctions than for negotiations in our sample (see Table 2 in §5.2).

required for the postannouncement phase of the M&A process when the sale is transacted as an auction than when it is transacted as a negotiation, *ceteris paribus*.

### 3.3. Accounting Quality and the Likelihood of Deal Completion

Our third question explores whether target firm accounting quality influences the likelihood that a proposed acquisition is ultimately completed. As reported by Bates and Lemmon (2003), 21% of announced deals are terminated prior to completion, and SDC reports an almost identical termination rate. Merger agreements are dissolved for a variety of reasons, including the occurrence of an MAE, the receipt of a higher bid after the agreement is publicly announced, a negative market reaction to the deal announcement (Luo 2005), or uncovering problems during the due diligence phase of the acquisition. Broadly speaking, the probability that a deal will be terminated increases with the probability that new information about the target's "true" value will emerge between the announcement and completion dates. The greater the target's valuation uncertainty—the lower the target firm's accounting quality—the more likely it is that this situation occurs. Stated formally:

**HYPOTHESIS 3A (H3A).** *Target firm accounting quality is positively associated with the likelihood of deal completion, ceteris paribus.*

Conditional on the method of sale, however, we expect that accounting quality will be relatively more important in determining whether a proposed deal transacted via auction is ultimately completed versus one transacted via negotiation. As with H2B, the fact that relatively more of the due diligence work in auctions occurs after the merger is publicly announced suggests that it is more likely that new information about the target's "true" value will emerge after an auction is conducted than if a negotiation had taken place. We consequently expect target firm accounting quality to be relatively more important in predicting merger outcomes in auction settings than in negotiations. Stated formally:

**HYPOTHESIS 3B (H3B).** *Target firm accounting quality is more positively associated with the likelihood of deal completion when the sale is transacted as an auction than when it is transacted as a negotiation, ceteris paribus.*

## 4. Research Design

### 4.1. Measuring Accounting Quality

In selecting a measure of accounting quality, we first consider the roles that this construct must play in our specific decision context. Ideally, high accounting quality should aid both the target and bidder in firm

valuation and in the identification of potential synergies from the acquisition. High accounting quality should also ease the due diligence process by improving transparency and helping to ensure that the target's financial statements are free of accounting distortions. An additional important consideration is that the decision usefulness of accounting information in this setting is *not* predicated on managers' deliberate actions to influence reported performance—that is, we expect a relation between target firm accounting quality and the course of the M&A process regardless of whether managers intentionally manage earnings in a particular direction. An accounting quality proxy that is susceptible to managerial manipulation may consequently reduce the statistical power of our tests.

Keeping these criteria in mind, we use the Dechow and Dichev (2002) model of accruals quality (AQ) as our primary measure of accounting quality. This model estimates how well current accruals capture past, current, and future operating cash flows. If current accruals do not map well into operating cash flows, this will complicate the already difficult valuation process and possibly obscure synergy identification. Poor mapping of cash flows to accruals is also likely to interfere with an efficient due diligence process. In addition, the Dechow and Dichev (2002) measure is arguably less vulnerable to managerial manipulation than alternative earnings quality proxies, such as earnings persistence, predictability, smoothing, and threshold measures (Dechow et al. 2010).<sup>9</sup> The Dechow and Dichev (2002) measure is thus well-matched to our hypotheses, which do not depend on the presence of managerial manipulation into the financial reporting process.

We follow McNichols (2002) and modify the Dechow and Dichev (2002) model by including current sales growth ( $\Delta REV$ ) and the current level of property, plant, and equipment ( $PPE$ ) into a regression of current accruals ( $\Delta WC$ ) on past, present, and future cash flow from operations as follows:

$$\Delta WC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta REV_t + \beta_5 PPE_t + \varepsilon_t. \quad (1)$$

The variable  $\Delta WC$  is the change in working capital from year  $t-1$  to  $t$ , or change in current assets (Compustat item ACT) minus change in current liabilities (Compustat item LCT), minus change in cash and

<sup>9</sup> We also reject asymmetric timeliness of losses and earnings response coefficients as accounting quality proxies in our setting, because they may also reflect managerial opportunism. For example, asymmetric timeliness of losses may reflect managers' manipulation of write-offs to influence future growth patterns, and earnings response coefficients may be influenced through managerial "expectations management" to avoid negative earnings surprises (Matsumoto 2002).



short-term investments (Compustat item CHE), and plus change in debt in current liabilities (Compustat item DLC). The variable *CFO* is cash flow from operations (Compustat item OANCF),  $\Delta REV$  is change in revenue (Compustat item SALE), and *PPE* is gross value of property, plant, and equipment (Compustat item PPEGT). All variables are scaled by average total assets (Compustat item AT).

We estimate Equation (1) cross-sectionally by year within each of the 48 Fama and French (1997) industry classifications and calculate the standard deviation of the residuals by firm over the five fiscal years prior to the merger announcement. Because a smaller standard deviation of residuals indicates better quality accruals, we multiply this measure by  $-1$  so that a higher AQ will indicate a higher quality of accruals.

Although we believe that the Dechow and Dichev (2002) AQ measure is the best choice for our setting, no accounting quality proxy is perfect (see, e.g., Wysocki 2009). One particular concern is the difficulty in clearly distinguishing accounting quality from “innate” firm characteristics that may be correlated with it. Dechow et al. (2010) illustrate this central problem within the earnings quality literature using a framework in which reported earnings is defined as  $f(X)$ ,  $X$  is fundamental performance, and the function  $f$  represents the accounting system that converts the unobservable  $X$  into observable earnings. Although  $X$  is an ambiguous construct, it may be generally described as “attributes within the firm, which are said to capture value-creating activities” (Penman and Sougiannis 1998, p. 348). Dechow et al. (2010, p. 345) observe that “the quality of the firm’s earnings depends on *both* the firm’s financial performance [i.e., attributes of the firm] and on the accounting system that measures it.” Financial executives also recognize that accounting quality is necessarily jointly determined. In recent survey evidence presented by Dichev et al. (2013), chief financial officers attribute roughly half of firms’ accounting quality to innate or nondiscretionary factors and the remainder to unintentional estimation errors and poor accounting standards, with perhaps 10% stemming from intentional earnings manipulation. Managers thus have influence over accounting quality, but intrinsic factors such as industry, macroeconomic conditions, and operating strategies also play prominent roles. The measure AQ reflects both of these components of accounting quality.

Although DeFond (2010) suggests that developing a model of accounting quality that definitively separates reported earnings from fundamental performance is a problem that may never be “solved” per se because the latter is unobservable, some empirical proxies for accounting quality are relatively less intertwined with firms’ innate factors than others.

In particular, Hribar et al. (2014) have developed an alternative measure of accounting quality based on unexplained audit fees (*UAF*) that predicts earnings restatements and fraud as well or better than other quality measures, but is less correlated with firms’ operating risk than other proxies that are based on realized earnings. In addition, as with the AQ measure, *UAF* offers the advantage that it cannot be easily manipulated by managers. We therefore triangulate our findings using the Hribar et al. (2014) measure.

We estimate the following model of audit fees by year and firm size decile:

$$\begin{aligned} \text{Ln}(\text{AUDITFEE}) &= \beta_0 + \beta_1 \text{BIG4}_i + \beta_2 \text{Ln}(\text{ASSETS}) + \beta_3 \text{BUSSEG} + \beta_4 \text{FGN} \\ &+ \beta_5 \text{INV} + \beta_6 \text{REC} + \beta_7 \text{DEBT} + \beta_8 \text{INCOME} + \beta_9 \text{LOSS} \\ &+ \beta_{10} \text{AUDOPIN} + \beta_{11} \text{CLIENT} + \beta_{12} \text{IPO} + \beta_{13} \text{SEO} \\ &+ \beta_{14} \text{ISSUANCE} + \beta_{15} \text{LITRISK} + \sum \text{IND} + \varepsilon. \end{aligned} \quad (2)$$

The variable  $\text{Ln}(\text{AUDITFEE})$  is the log of audit fees (Audit Analytics item AUDIT\_FEES); *BIG4* is an indicator variable that equals 1 if the firm’s audit is a member of the Big Five (or Big Four after the demise of Arthur Andersen) and 0 otherwise (Compustat item AU);  $\text{Ln}(\text{ASSETS})$  is the log of total assets (Compustat item AT); *BUSSEG* is the square root of the number of the firm’s business segments as reported on the Compustat Segment Data File; *FGN* is the ratio of foreign sales (from Compustat Segment Data) to total sales (Compustat item SALE); *INV* is inventory scaled by lagged total assets (Compustat item INVT); *REC* is receivables (Compustat item RECT) scaled by lagged total assets; *DEBT* is the sum of short- and long-term debt (Compustat item DLTT + DLC) scaled by lagged total assets; *INCOME* is operating income after depreciation (Compustat item OIADP) scaled by lagged total assets; *LOSS* is an indicator variable that equals 1 if the income before extraordinary and discontinued items (Compustat item IB) is negative in the current or previous two years and 0 otherwise; *AUDOPIN* is an indicator variable that equals 1 if the firm receives a modified audit opinion (Compustat item AUOP) and 0 otherwise; *CLIENT* is the square root of the number of years that firm has been a client of their current auditor (as determined from Compustat); *IPO* (*SEO*) is an indicator variable that equals 1 in the year of an initial public offering (seasoned equity offering) and 0 otherwise (from SDC); *ISSUANCE* is an indicator variable that equals 1 if the firm issued debt and 0 otherwise (from SDC); *LITRISK* is an indicator variable that equals 1 if the firm is in a high litigation industry, as defined by Francis et al. (1994), and 0 otherwise; and *IND* is an industry fixed effect based on two-digit Standard Industrial Classification (SIC).

codes. We suppress firm, year, and size decile subscripts in Equation (2). The residual from this model is an inverse measure of accounting quality; we therefore multiply the residual by  $-1$  to obtain our *UAF* variable, so that a higher residual will reflect higher accounting quality. We use the *UAF* estimate from the fiscal year prior to the M&A announcement in our empirical tests.

#### 4.2. Accounting Quality and Method of Sale

To test our first hypothesis that accounting quality is negatively associated with the likelihood that an acquisition will be transacted via an auction versus a negotiation, we follow Boone and Mulherin (2007, 2008) and estimate the following probit regression model:

$$\begin{aligned} \text{Prob}(\text{Auction}) \\ = f(\text{Accounting Quality}, \text{Target Size}, \text{Relative Size}, \\ \text{Stock Only}, \text{Cash \%}, \text{Tender Offer}, \text{Return SD}, \\ \text{Toehold}, \text{Target Initiated}). \end{aligned} \quad (3)$$

The dependent variable, *Auction*, equals 1 if the acquisition is conducted via an auction (i.e., there is more than one bidder attempting to acquire the target firm) and 0 if the acquisition is conducted via negotiation (i.e., there is a single bidder). Hypothesis 1 predicts a negative estimated coefficient on *AQ*—firms with poor accounting quality are more likely to choose an auction as their method of sale than a negotiation.

We include the following control variables in Equation (3): *Target Size*, defined as the natural log of target firm total assets (Compustat item *AT*) at the end of the fiscal year prior to the merger announcement; *Relative Size*, defined as the ratio of the target's to the bidder's market value, where market value is calculated as the book value of assets (*AT*) minus book value of equity (*CEQ*) plus common shares outstanding (*CSHO*) \* fiscal year price (*PRCC\_F*) at the end of the fiscal year prior to the merger announcement; *Stock Only*, defined as an indicator variable that equals 1 if the transaction is financed with 100% stock and 0 otherwise (obtained from Securities Data Corporation); *Cash*, defined as the percentage of the transaction that is financed with cash (from SDC); *Tender Offer*, defined as an indicator variable that equals 1 if the transaction involved a tender offer and 0 otherwise (from SDC); *Return SD*, defined as the standard deviation of target firm stock returns, estimated over days  $-317$  to  $-64$  relative to the deal announcement date (from CRSP daily file); *Toehold*, defined as an indicator variable that equals 1 if the bidder hold stocks of the target prior to the current deal and 0 otherwise (from SDC); and *Target Initiated*, defined as an

indicator variable that equals 1 if the target firm initiated the deal and 0 otherwise (from the merger background section of the Securities and Exchange Commission (SEC) filings 14A, S-4, and 14D). Based on the findings of Boone and Mulherin (2007) and Aktas et al. (2010), we expect negative estimated coefficients on *Target Size*, *Stock Only*, and *Toehold* and positive coefficients on *Cash %*, *Tender Offer*, *Return SD*, and *Target Initiated*, and make no prediction for *Relative Size*.

#### 4.3. Accounting Quality and the Speed of the M&A Process

To test our second set of hypotheses regarding the relationship between accounting quality and the length of the M&A process, we regress the log of the number of days in the pre- and postannouncement periods on our accounting quality measures and other control variables as follows:

$$\begin{aligned} \text{Ln}(\text{Days} + 1) \\ = f(\text{Accounting Quality}, \text{Auction}, \text{Accounting Quality} \\ * \text{Auction}, \text{Target Size}, \text{Relative Size}, \text{Stock Only}, \\ \text{Cash \%}, \text{Tender Offer}, \text{Toehold}, \text{Return SD}, \text{Target} \\ \text{Initiated}, \text{Prior Bidding}, \text{Family Firm}, \text{Same Industry}, \\ \text{Litigation}, \text{Premium}, \text{Deal Value}, \text{ROA}, \text{LIQ}, \\ \text{Debt/Assets}, \text{Book/Market}). \end{aligned} \quad (4)$$

In the preannouncement period, *Days* equals the number of days between the signing of a confidentiality agreement with a prospective bidder and merger announcement date. In the postannouncement period, *Days* equals the number of days between the merger announcement date and the date that the deal is either completed or terminated.<sup>10</sup> We obtain all relevant dates from SDC and SEC filings.

Hypothesis 2A predicts that accounting quality will speed the due diligence process and therefore reduce the time required for the transaction—i.e., we expect a negative estimated coefficient on *AQ* in Equation (4). To test H2B, we add an interaction term, *Auction* \* *AQ*, and predict a negative estimated coefficient in the postannouncement period, because we expect *AQ* to be relatively more important in due diligence that occurs after the merger agreement is publicly announced in the case of auctions, thereby reducing the length of time required to finalize the transaction.

<sup>10</sup> We add one to the number of days in Equation (4) so that the log transformation is always nonnegative, because there are 18 observations (15 negotiations and three auctions) in which the postannouncement period was zero days, i.e., the deal was announced and completed on the same day. *Days* for the preannouncement period is positive for all observations.

We also control for other firm and deal characteristics that could potentially affect the speed of the M&A process. In addition to the set of control variables defined above in Equation (3), we consider whether there is *Prior Bidding* for the target and whether the target is considered a *Family Firm*; both are defined as indicator variables that equal 1 if the target has the characteristic and 0 otherwise (obtained from SDC). We also include *Same Industry*, defined as an indicator variable that equals 1 if the target and bidder operate with the same Fama and French (1997) industry and 0 otherwise; *Litigation*, defined as an indicator variable that equals 1 if the target operates within an industry with high litigation risk (SIC Codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, or 7370) and 0 otherwise; *Premium*, defined as the offer price divided by the target firm's stock price seven days prior to the merger announcement, expressed as a percentage (from SDC); *Deal Value*, defined as the value of the transaction in millions of dollars (from SDC); *ROA*, defined as the ratio of the target's net income to total assets (Compustat item OIBDP/AT); *LIQ*, defined as the ratio of the target's net liquid assets to total assets (Compustat item (ACT – LCT)/AT); *Debt/Assets*, defined as the ratio of the target's total debt to total assets (Compustat item DLTT/AT); and *Book/Market*, defined as the ratio of the target's book value to market value of equity (Compustat item AT/(AT – CEQ + PRCC\_C \* CSHO)). *ROA*, *LIQ*, *Debt/Assets*, and *Book/Market* are measured at the end of the fiscal year prior to the merger announcement. In general, we expect *Stock Only*, *Prior Bidding*, and *Same Industry* to decrease the length of the M&A process and *Cash %* and *Litigation* to increase the length of time required for the deal, and make no predictions for the remaining control variables.

#### 4.4. Accounting Quality and Likelihood of Deal Completion

To test H3A and H3B, we estimate the following probit model:

$$\begin{aligned} \text{Prob(Completion)} \\ = f(\text{Accounting Quality, Auction, Accounting Quality} \\ * \text{Auction, Tender Offer, Stock Only, Prior Bidding,} \\ \text{Litigation, Family Firm, Deal Value, Premium, Target} \\ \text{Size, Book/Market, Debt/Assets, Target Initiated,} \\ \text{MAE, Relative Size, Cash \%, Toehold, Return SD,} \\ \text{ROA, LIQ}). \end{aligned} \quad (5)$$

The dependent variable, *Completion*, is an indicator variable that equals 1 if the proposed acquisition is completed and 0 if terminated. Based on H3A,

we expect a positive estimated coefficient on *AQ*—acquisitions of targets with high-quality accounting information are more likely to ultimately be completed than terminated. We again add an interaction term, *Auction \* AQ*, to test H3B; a positive estimated coefficient would be consistent with a stronger relation between accounting quality and the likelihood of deal completion for deals transacted via auctions.

Our control variables are taken from Bates and Lemmon (2003) and supplemented with additional variables identified by Bates et al. (2006) and Heron and Lie (2006). Bates and Lemmon (2003) find that *Tender Offers* and *Stock Only* offers significantly increase the probability of deal completion, whereas *Prior Bidding*, *Litigation* risk, and *Family Firm* ownership decrease the probability of deal completion. Bates et al. (2006) and Heron and Lie (2006) also control for the *Deal Value* and the *Premium* paid for the acquisition, in addition to different target's characteristics (e.g., *Target Size*, *Book/Market*, and *Debt/Assets* ratios), but find that premium is the only additional variable that is positively correlated with the completion probability. We also control for whether the deal was *Target Initiated*, because DeBodt et al. (2012) argue that target firms that initiate deals are more "willing-to-sell" than other firms, and the *Number of MAE* clauses in the merger agreement, which allow a party to terminate the deal before closing if triggered (obtained from the merger background section of the SEC filings 14A, S-4, and 14D). Finally, for completeness, we include the remaining control variables from Equations (3) and (4)—*Relative Size*, *Cash %*, *Toehold*, *Return SD*, *ROA*, *LIQ*, and *Same Industry*, as defined above—but have no priors regarding their expected sign in Equation (5).

## 5. Sample Selection and Descriptive Statistics

### 5.1. Sample Selection Criteria

Table 1 describes our sample selection procedure. The sample originates from the SDC Merger and Acquisitions database and includes all merger agreements that were publicly announced between January 1, 1990, and December 31, 2009, that also meet the following criteria:

- Deal value is disclosed in SDC and is larger than US\$1 million.
- Both bidder and target are publicly listed U.S. firms.
- The bidder owns (or seeks to own) 100% of the target's shares after the transaction.
- The acquisition is for at least 50% of the target's outstanding shares.

We limit our sample to merger agreements where the bidder seeks to own 100% of the public



**Table 1** Sample Selection Procedure

	No. of observations
Announced M&A deals for years 1990–2009	181,083
Less:	
Deals without value information	(94,864)
Deal in which the target/bidder is a private company	(60,739)
Deals in which the bidder owned (or sought to own) less than 100% of the target's shares after the transaction	(19,307)
Deals in which less than 50% of the target was acquired (or sought to be acquired)	(233)
Deal in which the target is not a U.S. company	(1,162)
	<b>4,778</b>
Less:	
Deals with missing target accounting quality data	(3,212)
Deals with missing other target Compustat data	(439)
Less:	1,127
Deals with missing SEC data	(108)
Less:	<b>1,019</b>
Hostile deals	(42)
Final sample	<b>977</b>
By sales method:	
Auctions	479
Negotiations	498
	<b>977</b>
By outcome:	
Completed deals	794
Terminated deals	183
	<b>977</b>

*Notes.* This table describes our sample selection procedure. The sample originates from the SDC Mergers and Acquisitions database and includes all deals announced between 1990 and 2009 where the deal value is larger than \$1 million. Auctions (negotiations) are defined as deals in which there are more than (exactly) one bidder in the preannouncement acquisition process. Completed (terminated) deals include deals in which the proposed merger is ultimately (not) consummated, as reported by SDC.

target after the transaction because only these types of acquisitions require the filing of the merger agreement with the SEC. As shown in Table 1, we lose 3,759 observations due to missing Compustat or SEC data and 42 observations due to hostile takeovers. We eliminate hostile takeovers because we model sales method choice as jointly determined by both target and bidder firms.<sup>11</sup> A total of 977 publicly announced deals are included in the final sample.<sup>12</sup>

<sup>11</sup> Our results are insensitive to including hostile takeovers in the analysis.

<sup>12</sup> Note that each announced deal appears exactly once in our sample, regardless of the sales method. For example, suppose three firms *A*, *B*, and *C* participate in an auction of target *X*, and firm *B* is the winner. Only one observation, with firm *X* as the target and firm *B* as the bidder, is included in the analysis. However, a target firm may appear twice in the sample if it is involved in two completely separate deals, such as when a first deal is publicly announced but later terminated, and a second, successful deal with a different bidder occurs. In each case, a separate merger agreement would have been filed with the SEC. Our sample includes 39 target firms involved in more than one deal attempt; our results are insensitive to their omission.

Following Boone and Mulherin (2007) and Aktas et al. (2010), we use the merger background section of the SEC filings 14A, S-4, and 14D to classify the selling procedure as either an auction or a negotiation. We classify the sales method as an auction if the target firm contacts and signs confidentiality agreements with more than one prospective bidder in the preannouncement period; if the target firm deals with a single bidder in the preannouncement period, we classify the transaction as a negotiation. We classify 49% of our sample (479 of 977 announced deals) as auctions and 51% (498 of 977) as negotiations, which is very similar to the 50–50 split between auctions and negotiations reported by Boone and Mulherin (2007). In addition, we classify 81.3% of announced deals as completed (794 of 977) and 18.7% as terminated (183 of 977) using SDC data. The termination rate of 18.7% is comparable to the 21% rate reported by Bates and Lemmon (2003) over their sample period of 1989 to 1998.

## 5.2. Descriptive Statistics

Table 2 presents summary statistics (means, medians, or frequencies) for the full sample of announced deals, as well as by method of sale. The second column presents the statistics for the full sample, the third and fourth columns show averages for auctions and negotiations, respectively, and the fifth column presents appropriate statistics for differences between auctions and negotiations.

We first examine bid characteristics. As Panel A shows, the mean deal value is US\$1,459 million, and the ratio of target-to-bidder market value (*Relative Size*) is 0.291. *Relative Size* is significantly smaller for auctions than for negotiations—the mean (median) value is 0.239 (0.103) for auctions versus 0.344 (0.159) for negotiations (both significant at  $\alpha = 0.01$ ). Auctions have a mean (median) of 14.4 (6) bidders, whereas, by definition, negotiations always have a single bidder. Auctions also have significantly more MAE clauses than negotiations, with a mean (median) of 5.2 (5) MAEs versus 2.8 (2) for negotiations, consistent with the notion that auctions are associated with greater valuation uncertainty than negotiations.

Auctions also take longer to complete than negotiations—the mean (median) number of days to deal resolution is 305 (196) for auctions versus 232 (122) for negotiations ( $\alpha = 0.05$ ). This difference is mainly due to a significantly longer postannouncement period. The mean (median) number of days in the preannouncement period is 122 (103) for auctions versus 110 (96) for negotiations, but this difference does not quite reach conventional levels of significance. However, in the postannouncement period, the mean (median) number of days is 182 (145)



**Table 2** Descriptive Statistics

Variable	Total sample ( <i>N</i> = 977)	Auction ( <i>N</i> = 479)	Negotiation ( <i>N</i> = 498)	<i>t</i> -statistic [ <i>Z</i> -statistic]
Panel A: Bid characteristics				
<i>Deal Value</i> (\$M)	1,459	1,451	1,473	−0.94
[Median]	[568]	[560]	[591]	[−0.81]
<i>Relative Size</i>	0.291	0.239	0.344	−2.89***
[Median]	[0.137]	[0.103]	[0.159]	[−2.58]***
<i>Number of Bidders</i>	7.4	14.4	1.0	5.85***
[Median]	[4.0]	[6.0]	[1.0]	[4.93]***
<i>Number of MAE</i>	3.9	5.2	2.8	4.07***
[Median]	[3.0]	[5.0]	[2.0]	[3.88]***
<i>Days, Pre-announcement</i>	118	122	110	1.38
[Median]	[105]	[103]	[96]	[1.27]
<i>Days, Post-announcement</i>	151	182	122	2.81***
[Median]	[119]	[145]	[101]	[2.49]**
<i>Days for Deal Resolution</i>	269	305	232	2.25**
[Median]	[148]	[196]	[122]	[2.01]**
<i>% Premium</i>	46.43%	45.29%	47.55%	−0.18
[Median]	[39.15%]	[38.09%]	[40.29%]	[−0.04]
<i>Toehold</i>	62	27	35	$\chi^2 = 0.795$
(% of sample)	(6.34%)	(5.63%)	(7.02%)	
<i>% of Toehold</i>	19.81%	14.23%	25.02%	−1.92**
[Median]	[0.00%]	[0.00%]	[0.00%]	[−1.37]
<i>Tender Offer</i>	253	80	173	$\chi^2 = 41.39$ ***
(% of sample)	(25.89%)	(16.70%)	(34.73%)	
<i>Stock Only</i>	313	161	152	$\chi^2 = 1.07$
(% of sample)	(32.03%)	(33.61%)	(30.52%)	
<i>Cash Only</i>	321	177	144	$\chi^2 = 7.14$ ***
(% of sample)	(32.85%)	(36.95%)	(28.91%)	
<i>Cash %</i>	34.48%	36.10%	31.81%	1.175*
[Median]	[0.00%]	[0.00%]	[0.00%]	[1.13]
<i>Prior Bidding</i>	43	20	23	$\chi^2 = 0.11$
(% of sample)	(4.89%)	(4.72%)	(5.05%)	
<i>Litigation</i>	27	11	16	$\chi^2 = 0.76$
(% of sample)	(2.76%)	(2.29%)	(3.21%)	
<i>Family Firm</i>	12	9	3	$\chi^2 = 3.27$ *
(% of sample)	(1.22%)	(1.87%)	(0.60%)	
<i>Same Industry</i>	506	245	261	$\chi^2 = 0.15$
(% of sample)	(51.79%)	(51.14%)	(52.40%)	
<i>Target Initiated</i>	462	341	121	$\chi^2 = 215.38$ ***
(% of sample)	(47.28%)	(71.19%)	(24.29%)	
<i>Bidder Initiated</i>	362	138	224	$\chi^2 = 27.31$ ***
(% of sample)	(37.05%)	(28.81%)	(44.9%)	
<i>Target and Bidder Initiated</i>	153	0	153	$\chi^2 = 174.48$ ***
(% of sample)	(15.66%)	(0.00%)	(30.72%)	

for auctions versus 122 (101) for negotiations (*p*-value = 0.01 for mean and 0.05 for median differences, respectively). This pattern is consistent with the fact that relatively more of the due diligence work in auctions occurs after the merger agreement is publicly announced than in negotiations, where due diligence often starts very early in the process. We also find that auctions are characterized by significantly

**Table 2** (Continued)

Variable	Total sample ( <i>N</i> = 977)	Auction ( <i>N</i> = 479)	Negotiation ( <i>N</i> = 498)	<i>t</i> -statistic [ <i>Z</i> -statistic]
Panel B: Target characteristics				
<i>AQ</i>	−0.039	−0.055	−0.024	−5.25***
[Median]	[−0.031]	[−0.047]	[−0.023]	[−4.61]***
<i>UAF</i>	−0.016	−0.021	−0.011	−4.34***
[Median]	[−0.010]	[−0.018]	[−0.002]	[−3.53]***
<i>Target Size</i> (\$M)	1,283	1,159	1,403	−1.88*
[Median]	[345]	[315]	[378]	[−1.67]*
<i>ROA</i>	0.115	0.111	0.118	0.93
[Median]	[0.104]	[0.102]	[0.105]	[0.51]
<i>LIQ</i>	0.182	0.185	0.172	0.58
[Median]	[0.145]	[0.147]	[0.144]	[0.26]
<i>Debt/Assets</i>	0.271	0.265	0.278	0.39
[Median]	[0.258]	[0.250]	[0.261]	[0.16]
<i>Book/Market</i>	0.649	0.655	0.641	−0.75
[Median]	[0.630]	[0.637]	[0.628]	[−0.39]
<i>Return SD</i>	0.022	0.026	0.018	2.81***
[Median]	[0.018]	[0.020]	[0.016]	[2.12]**
Panel C: Bidder characteristics				
<i>Bidder Size</i> (\$M)	10,743	10,321	11,125	−2.25**
[Median]	[2,201]	[2,011]	[2,391]	[−1.98]*

*Notes.* This table reports descriptive statistics for the full sample (second column), for auctions (third column), and for negotiations (fourth column). The rightmost column shows the *t*-statistic and *Z*-statistic (in brackets) or chi-squared for a test of mean and median or frequency differences, respectively, between auctions and negotiations. All data are winsorized at the 1% and 99% levels. See the appendix for variable definitions.

\*Significant at the 0.10 level; \*\*significant at the 0.05 level; \*\*\*significant at the 0.01 level.

smaller toehold percentages (14.23% for auctions versus 25.02% for negotiations), are significantly less likely to involve tender offers (16.70% versus 34.73%), and are significantly more likely to be an all cash deal (36.95% versus 28.91%). Last, consistent with DeBodt et al. (2012), we find that auctions are significantly more likely to be initiated by the target firm than by the bidder (71.19% versus 24.29%,  $\alpha = 0.01$ ), whereas negotiations are significantly more likely to be initiated by the bidder than by the target firm (44.90% versus 28.81%,  $\alpha = 0.01$ ).<sup>13</sup>

Panel B of Table 2 presents descriptive statistics on target characteristics. First, we compare mean and median *AQ* between auctions and negotiations. As expected, we find that *AQ* is significantly lower when the target firm is sold via auction, with mean (median) *AQ* of −0.055 (−0.047) for auctions versus −0.024 (−0.023) for negotiations (*p* = 0.01 for both means and medians). We also find that *UAF* is significantly lower auctions versus negotiations—the mean

<sup>13</sup> We are unable to clearly determine the initiator in 153 deals (15.66% of our sample). We alternatively define our *Target Initiated* indicator variable to include these observations in our sensitivity tests; our results are robust to their inclusion.

**Table 3** Pearson (Spearman) Correlation Coefficients in Lower (Upper) Triangle

	AQ	UAF	Target Size	Relative Size	Stock Only	Cash %	Tender Offer	Toehold	Return SD	Target Initiated	ROA	LIQ	Debt/Assets	Book/Market
AQ		<b>0.131</b>	<b>0.279</b>	<b>0.166</b>	−0.011	<b>0.062</b>	<b>0.179</b>	0.009	− <b>0.418</b>	− <b>0.358</b>	<b>0.089</b>	−0.031	<b>0.238</b>	<b>0.118</b>
UAF	<b>0.201</b>		<b>0.130</b>	<b>0.209</b>	0.010	−0.046	<b>0.206</b>	0.009	− <b>0.226</b>	− <b>0.289</b>	0.010	− <b>0.104</b>	<b>0.081</b>	0.059
Target Size	<b>0.248</b>	−0.008		<b>0.091</b>	−0.029	<b>0.207</b>	0.036	<b>0.289</b>	− <b>0.371</b>	<b>0.199</b>	<b>0.209</b>	− <b>0.361</b>	<b>0.055</b>	− <b>0.215</b>
Relative Size	<b>0.178</b>	<b>0.224</b>	<b>0.103</b>		<b>0.403</b>	− <b>0.152</b>	0.051	<b>0.143</b>	−0.053	<b>0.315</b>	<b>0.285</b>	− <b>0.134</b>	<b>0.121</b>	<b>0.382</b>
Stock Only	−0.031	0.027	−0.044	<b>0.383</b>		−0.010	<b>0.354</b>	0.031	0.019	−0.033	− <b>0.070</b>	0.032	− <b>0.110</b>	− <b>0.145</b>
Cash %	0.042	− <b>0.080</b>	0.046	− <b>0.181</b>	0.007		− <b>0.244</b>	− <b>0.219</b>	−0.043	0.054	0.052	−0.041	−0.001	−0.060
Tender Offer	<b>0.143</b>	<b>0.195</b>	0.041	0.048	<b>0.360</b>	− <b>0.221</b>		<b>0.073</b>	−0.009	− <b>0.217</b>	<b>0.073</b>	−0.055	0.006	0.037
Toehold	0.022	0.011	<b>0.301</b>	<b>0.157</b>	0.036	− <b>0.237</b>	<b>0.056</b>		−0.021	− <b>0.280</b>	0.006	−0.028	0.021	0.001
Return SD	− <b>0.386</b>	− <b>0.231</b>	− <b>0.362</b>	− <b>0.055</b>	0.024	−0.030	−0.012	−0.028		<b>0.248</b>	− <b>0.091</b>	0.005	− <b>0.183</b>	− <b>0.197</b>
Target Initiated	− <b>0.367</b>	− <b>0.302</b>	<b>0.216</b>	<b>0.355</b>	−0.029	0.067	− <b>0.231</b>	<b>0.349</b>	<b>0.251</b>		− <b>0.143</b>	0.061	−0.046	0.031
ROA	<b>0.128</b>	0.065	<b>0.239</b>	<b>0.304</b>	− <b>0.098</b>	<b>0.076</b>	<b>0.061</b>	0.004	− <b>0.105</b>	− <b>0.137</b>		−0.020	− <b>0.126</b>	− <b>0.435</b>
LIQ	− <b>0.085</b>	− <b>0.089</b>	− <b>0.254</b>	− <b>0.093</b>	0.044	−0.038	−0.021	0.001	−0.026	<b>0.066</b>	− <b>0.099</b>		− <b>0.254</b>	− <b>0.165</b>
Debt/Assets	<b>0.197</b>	0.071	0.031	<b>0.114</b>	− <b>0.105</b>	−0.024	0.002	0.013	− <b>0.169</b>	−0.051	− <b>0.069</b>	− <b>0.210</b>		<b>0.439</b>
Book/Market	<b>0.102</b>	<b>0.140</b>	− <b>0.064</b>	<b>0.276</b>	− <b>0.138</b>	− <b>0.085</b>	0.033	0.016	− <b>0.182</b>	0.038	− <b>0.191</b>	− <b>0.214</b>	<b>0.358</b>	

Notes. This table reports simple correlations among various relevant variables. All data are winsorized at the 1% and 99% levels. See the appendix for variable definitions. Correlations significantly different from zero at  $p$ -values less than 10% are in bold.

(median) *UAF* is −0.021 (−0.018) for auctions versus −0.011 (−0.002) for negotiations ( $p = 0.01$  for both means and medians).<sup>14</sup>

Target firms in auctions are marginally significantly smaller than in negotiations, with mean (median) market values of \$1,159 million (\$315 million) and \$1,403 million (\$382 million), respectively ( $p = 0.10$  for both means and medians). Target firms in auctions also have significantly higher stock return volatility than their counterparts in negotiations—mean (median) *Return SD* is 0.026 (0.020) for auctions versus 0.018 (0.016) for negotiations ( $p = 0.01$  for means and  $p = 0.05$  for medians). Last, we examine bidder firm size and find that bidders in negotiated deals are significantly larger than in auctions ( $p = 0.05$ ).

Correlation coefficients between our most relevant independent variables are presented in Table 3. The Pearson (Spearman) coefficient between *AQ* and *UAF* is significantly positive at 0.201 (0.131), though not especially high, consistent with Hribar et al. (2014). Table 3 also reveals that *AQ* tends to be more strongly associated with the accounting-based control variables, especially those that include the effects of accruals, than is *UAF*. For example, *AQ* is significantly positively associated with *Target Size* (Pearson  $\rho = 0.248$ ) and *ROA* ( $\rho = 0.128$ ), consistent with prior research (Francis et al. 2005, Doyle et al. 2007), whereas the Pearson correlation between *UAF* and *Target Size* is almost zero ( $\rho = -0.008$ ), and the correlation between *UAF* and *ROA* is no longer significant ( $\rho = 0.065$ ). *AQ* is also significantly positively associated with *Debt/Assets* ( $\rho = 0.197$ ), consistent with Biddle et al. (2009), but *UAF* is not ( $\rho = 0.071$ ). These findings support assertions by Hribar et al. (2014) that *UAF* is

generally less likely to reflect innate firm characteristics that may influence accounting quality than *AQ*, as do their relative correlations with *Return SD* ( $\rho = -0.386$  for *AQ* versus  $-0.231$  for *UAF*). Interestingly, *LIQ*—the ratio of net current to total assets—is negatively correlated with both *AQ* and *UAF*, which is broadly consistent with the findings of Barton and Simko (2002), who associate the accumulation of operating assets on the balance sheet with past accrual management. Table 3 also shows that *Target Initiated* is significantly negatively correlated with both *AQ* and *UAF*, as well as *Tender Offer*, and positively associated with *Target Size*, *Relative Size*, *Toehold*, and *Return SD*. In other words, larger target firms with lower accounting quality and greater return volatility are more likely to initiate M&A transactions, especially when the acquiring firm is already a shareholder of the target.

Although many of these relationships are consistent with our expectations, one concern is whether the inclusion of these control variables induces or mitigates estimation bias in our analyses. Multicollinearity results in unbiased but inefficient coefficient estimates under both OLS, which we use to estimate Equation (4), and probit analysis, which we use to estimate Equations (3) and (5) (Gessner et al. 1988). This may lead to insignificant coefficients on our variables of interest. To assess the extent to which our results are affected by multicollinearity, we examine the variance inflation factors for each matrix of explanatory variables when estimating Equations (3)–(5); none are greater than (5), which is well below the recommended ceiling of 10 that would indicate a serious multicollinearity problem (Greene 2007).

<sup>14</sup> Due to the data requirements to calculate *UAF*, our sample size for this variable drops from 977 to 460.

## 6. Empirical Results

### 6.1. Accounting Quality and the Method of Sale

We present the results from estimating Equation (3)—our model of sales method choice—in Table 4. We present eight different specifications. In Models 1 and 2, we include *AQ* with control variables shown in the prior literature to relate to sales method choice, as in Equation (3); in Model 3, we add target firm accounting-based variables that are related to the likelihood of hostile takeovers (Raman et al. 2013); and in Model 4, we include additional controls from Equations (4) and (5) to help ensure that we have no correlated omitted variables. In Models 5–8, we replace *AQ* with *UAF* and report results for a smaller sample of 460 deals. To address potential cross-sectional correlation among residuals, we include Fama and French (1997) industry fixed effects in our estimation of Equation (3) (as well as Equations (4) and (5)) and calculate standard errors clustered by year.<sup>15</sup>

The results are consistent across all eight specifications. In Model 1, the estimated coefficient on *AQ* is significantly negative at  $-2.324$  with a  $p$ -value of  $0.001$ , consistent with our first hypothesis that *AQ* will be negatively (positively) associated with the use of auctions (negotiations) in M&A transactions. In Model 2, we find that auctions are more likely to occur if the deal is initiated by the target firm, consistent with prior research; the estimated coefficient is  $0.165$  and highly significantly positive. Of greater interest, however, is the significantly negative estimated coefficient of  $-1.389$  ( $p = 0.039$ ) on the interaction term *AQ* \* *Target Initiated*, which indicates that the relationship between *AQ* and sales method choice is stronger when the target initiates the deal. We also find in Models 1 and 2 that the estimated coefficient on *Relative Size* is significantly negative, indicating that target firms that are small in relation to their bidder are more likely to be sold via auction than negotiation. We also find that the likelihood of an auction is significantly increasing in the percentage of cash used to finance the deal, consistent with prior research. None of the accounting-based variables added in Model 3 are significant; this may be due to the fact that we have omitted hostile takeovers from our sample. In addition, we find in Model 4 that target firms with prior bidding activity are marginally more likely to be sold through a negotiation process.

In Models 5–8, we replace *AQ* with *UAF*. In all four models, we report a significantly negative estimated

coefficient on *UAF*, consistent with H1. In general, the results do not change markedly from those in Models 1–4, though the  $p$ -values for the *UAF* variables are slightly increased compared to those for *AQ*. We also find that the estimated coefficients on *Return SD* are marginally significantly positive in Models 6 and 8. These findings are consistent with the assertion by Hribar et al. (2014) that *UAF* reflects less operating risk than does *AQ*.<sup>16</sup>

Finally, to get a sense of the economic magnitude that *AQ* has on the choice of sales mechanism, we estimate the marginal effect of our accounting quality variables on the probability that an auction occurs using the procedure outlined in Greene (2007). We evaluate marginal effects using the mean values for each of our independent variables. In Model 1, an increase from the first quartile of *AQ* to the third quartile increases the probability of an auction by  $0.08$ . Given that the unconditional mean of an auction occurring is  $0.49$ , this represents an economically meaningful incremental change. We thus conclude that accounting quality is an economically significant determinant of sales method choice in M&A deals, consistent with our expectations.<sup>17</sup>

### 6.2. Accounting Quality and the Speed of the M&A Process

We present our tests of H2A and H2B in Table 5. In Models 1 and 2, the dependent variable is the log of the total number of days required for deal resolution; in Models 3 and 4, we examine the length of the pre-announcement period; and in Models 5 and 6, we examine the postannouncement period. As shown in Model 1 of Table 5, the estimated coefficient on *AQ* is

<sup>16</sup> Accounting quality and stock return volatility are likely to capture different aspects of valuation uncertainty. For example, stock return volatility might be a reasonable uncertainty measure if we are valuing the target firm as a stand-alone asset, but may be less useful when attempting to estimate potential synergies between the bidder and target firm. In addition, both *AQ* and *UAF* have been found to have significant power in predicting accounting fraud, earnings restatements, and internal control deficiencies that would interfere with proper valuation of the target firm. These differences are likely behind the varying ability of accounting quality and return volatility to explain sales method choice.

<sup>17</sup> To determine whether our results are sensitive to selection bias, we also use a bivariate probit model to simultaneously estimate the likelihood of a takeover and the likelihood of employing an auction as the sales method. We follow Ambrose and Megginson (1992) to model the likelihood of a takeover, using the following independent variables: four-year average excess return, growth resource dummy (a combination of sales growth, net liquid assets, and long-term debt), market-to-book ratio, price-to-earnings ratio, net book value, PPE/book, percentage of institutional ownership, and change in percentage of institutional ownership. We lose 63 observations due to missing institutional ownership data, and the pseudo- $R^2$  is relatively low at  $0.09$ . Our results are insensitive to controlling for the likelihood of target takeover.

<sup>15</sup> Petersen (2009) and Gow et al. (2010) generally advocate two-way clustering by firm and year; however, our sample lacks multiple observations by firm, with the exception of the 39 observations discussed in Footnote 12. As a sensitivity test, we calculate two-way clustered standard errors based on industry and year; our inferences are unaffected. We thank Dan Taylor for providing the computer code for this analysis.

**Table 4** Probit Estimation of Sales Method Choice

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
<i>Intercept</i>	−0.549** (0.008)	−0.503** (0.018)	−0.748*** (0.001)	−0.616*** (0.001)	−0.308 (0.123)	−0.253 (0.143)	−0.301 (0.115)	−0.376* (0.089)
<i>AQ</i>	<b>−2.324***</b> (0.001)	<b>−2.425***</b> (0.003)	<b>−2.579***</b> (0.005)	<b>−2.563***</b> (0.004)				
<i>UAF</i>					<b>−0.409***</b> (0.009)	<b>−0.334**</b> (0.019)	<b>−0.346**</b> (0.015)	<b>−0.387**</b> (0.011)
<i>Target Initiated</i>		0.165*** (0.001)	0.163*** (0.001)	−0.159*** (0.003)		0.208*** (0.005)	0.229*** (0.003)	0.249*** (0.001)
<i>AQ * Target Initiated</i>		<b>−1.389**</b> (0.039)	<b>−1.503**</b> (0.019)	<b>−1.429**</b> (0.023)				
<i>UAF * Target Initiated</i>						<b>−0.126**</b> (0.041)	<b>−0.126**</b> (0.042)	<b>−0.115*</b> (0.053)
<i>Target Size</i>	−0.064 (0.794)	−0.062 (0.803)	−0.062 (0.799)	−0.056 (0.610)	−0.059 (0.278)	−0.051 (0.263)	−0.052 (0.276)	−0.052 (0.281)
<i>Relative Size</i>	−0.016*** (0.006)	−0.029*** (0.001)	−0.015*** (0.003)	−0.016*** (0.005)	−0.012** (0.013)	−0.008** (0.016)	−0.009** (0.014)	−0.009** (0.014)
<i>Stock Only</i>	−0.258 (0.119)	−0.250 (0.112)	0.261 (0.125)	0.262 (0.129)	0.112 (0.555)	0.104 (0.585)	0.106 (0.608)	0.106 (0.624)
<i>Cash %</i>	0.003** (0.047)	0.002** (0.049)	0.001* (0.055)	0.002* (0.051)	0.003** (0.021)	0.009** (0.016)	0.008** (0.016)	0.005** (0.019)
<i>Tender Offer</i>	−0.283 (0.138)	−0.293 (0.115)	−0.261 (0.179)	−0.251 (0.198)	−0.046 (0.758)	−0.035 (0.869)	−0.036 (0.825)	−0.039 (0.804)
<i>Toehold</i>	−0.001 (0.803)	−0.001 (0.805)	−0.001 (0.802)	−0.001 (0.801)	−0.001 (0.911)	−0.001 (0.903)	−0.001 (0.896)	−0.001 (0.889)
<i>Return SD</i>	0.056 (0.271)	0.053 (0.239)	0.055 (0.261)	0.051 (0.224)	0.085 (0.109)	0.083* (0.094)	0.083* (0.089)	0.081* (0.069)
<i>ROA</i>			−0.006 (0.248)	−0.016 (0.421)			−0.032 (0.685)	−0.038 (0.635)
<i>LIQ</i>			0.101 (0.198)	0.095 (0.173)			0.184 (0.491)	0.189 (0.483)
<i>Debt/Assets</i>			−0.327 (0.460)	−0.301 (0.492)			−0.380 (0.498)	−0.361 (0.528)
<i>Book/Market</i>			0.251 (0.376)	0.179 (0.329)			0.297 (0.114)	0.304 (0.122)
<i>Prior Bidding</i>				−0.221* (0.081)				−0.173* (0.091)
<i>Litigation</i>				0.097 (0.716)				0.109 (0.326)
<i>Family Firm</i>				0.355 (0.603)				0.128 (0.358)
<i>Premium</i>				0.003 (0.317)				0.016 (0.295)
<i>Deal Value</i>				0.009 (0.451)				0.003 (0.206)
<i>Same Industry</i>				−0.069 (0.109)				−0.083* (0.079)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo <i>R</i> -squared	0.32	0.35	0.29	0.30	0.22	0.25	0.23	0.23
<i>N</i>	479/498	479/498	479/498	479/498	254/206	254/206	254/206	254/206

*Notes.* This table reports probit regression results where the dependent variable equals 1 if the sales method is an auction and 0 if a negotiation. All regressions also include Fama and French (1997) 48-industry dummies. All data are winsorized at the 1% and 99% levels. The *p*-values are presented in parentheses with the standard errors clustered by year (Petersen 2009, Gow et al. 2010). See the appendix for variable definitions. Test variable coefficients significantly different from zero at *p*-values less than 10% are in bold.

\*Significant at the 0.10 level; \*\*significant at the 0.05 level; \*\*\*significant at the 0.01 level.



**Table 5** Log-Linear Regression of Length of the Due Diligence Period

Variable	Total days		Preannouncement		Postannouncement	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Intercept</i>	2.383*** (8.29)	1.638*** (6.04)	1.406*** (4.02)	0.603*** (3.04)	2.351*** (8.81)	2.031*** (5.52)
<i>Auction</i>	0.021** (2.22)	0.016** (2.43)	0.015** (2.224)	0.009* (1.80)	0.075** (2.32)	0.037*** (3.18)
<i>AQ</i>	<b>−0.641*</b> (1.82)		<b>−0.404**</b> (−2.37)		−0.791 (−1.36)	
<i>Auction * AQ</i>	−0.351 (−0.82)		−0.388 (−1.27)		−0.337 (−0.48)	
<i>UAF</i>		<b>−0.502***</b> (−2.79)		<b>−0.596**</b> (−3.12)		<b>−0.318*</b> (−1.90)
<i>Auction * UAF</i>		<b>−0.311**</b> (−2.25)		<b>−0.370**</b> (−2.02)		<b>−0.248***</b> (−3.07)
<i>Target Initiated</i>	0.022 (1.49)	0.014* (1.74)	0.015 (1.21)	0.006 (1.47)	0.018** (2.35)	0.0099* (1.91)
<i>Target Size</i>	0.003 (0.48)	0.011 (0.39)	0.003 (0.39)	0.012 (0.81)	0.001 (0.26)	0.005 (0.20)
<i>Relative Size</i>	−0.005 (−0.36)	0.001 (0.89)	−0.003 (0.29)	0.002 (0.12)	0.001 (0.01)	0.005 (1.03)
<i>Stock Only</i>	−0.185*** (−4.69)	−0.148** (−2.17)	−0.071 (−1.48)	−0.045 (−1.13)	−0.133*** (−3.94)	−0.134* (−1.92)
<i>Cash %</i>	0.009 (0.20)	0.004 (0.12)	0.049 (0.74)	0.075 (0.46)	0.001 (0.74)	0.002 (0.01)
<i>Tender Offer</i>	0.015 (0.38)	0.047 (0.48)	0.019 (0.95)	0.035 (0.92)	0.37 (0.16)	0.014 (0.19)
<i>Toehold</i>	−0.005** (−2.19)	−0.005*** (−2.76)	−0.008** (−2.00)	−0.013** (−2.51)	−0.003** (−2.41)	−0.002* (−1.76)
<i>Return SD</i>	0.005 (0.43)	0.001 (0.22)	0.008 (0.29)	0.003 (0.18)	0.001 (0.19)	0.001 (0.05)
<i>ROA</i>	0.820*** (3.19)	0.490** (2.46)	1.420** (2.41)	1.454** (2.10)	0.526*** (3.13)	0.381* (1.91)
<i>LIQ</i>	0.328* (1.81)	0.207 (1.27)	0.769* (1.96)	0.688 (1.41)	0.281 (1.51)	0.151 (0.93)
<i>Debt/Assets</i>	0.470** (2.55)	0.361* (1.93)	0.965** (2.37)	0.998** (2.03)	0.360*** (3.21)	0.308*** (3.51)
<i>Book/Market</i>	0.252** (2.02)	0.164 (1.07)	0.238* (1.83)	0.165 (0.77)	0.091 (1.24)	0.36 (0.43)
<i>Prior Bidding</i>	−0.035*** (−3.21)	−0.062** (−2.09)	−0.053*** (−3.77)	−0.073*** (−3.16)	−0.110 (−0.79)	−0.179 (−1.15)
<i>Litigation</i>	0.195 (1.37)	0.089 (0.62)	0.081 (0.33)	0.035 (0.45)	0.237 (1.02)	0.124 (1.03)
<i>Family Firm</i>	0.080 (1.37)	0.091 (1.46)	0.019 (1.01)	0.037 (1.54)	0.022 (0.91)	0.48 (1.61)
<i>Premium</i>	0.001 (0.01)	−0.001 (−0.70)	0.003 (0.89)	0.002 (0.45)	0.001 (0.18)	−0.002 (−0.41)
<i>Deal Value</i>	0.001 (0.02)	−0.001 (−0.15)	−0.001 (−0.13)	−0.001 (−0.49)	0.003 (0.82)	−0.002 (−0.08)
<i>Same Industry</i>	−0.185*** (−2.97)	−0.203*** (3.20)	−0.237*** (−4.69)	−0.245*** (−4.99)	−0.105* (−1.71)	−0.155* (−1.91)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	977	460	977	460	977	460
Adjusted <i>R</i> -squared	0.248	0.203	0.301	0.224	0.213	0.172

*Notes.* This table reports regression results where the dependent variable is the log of the number of days in the due diligence period. The dependent variables in Models 1 and 2, 3 and 4, and 5 and 6 are the log of number of days during the entire due diligence process, during the preannouncement due diligence period, and during the postannouncement due diligence period, respectively. All regressions also include Fama and French (1997) 48-industry dummies. All data are winsorized at the 1% and 99% levels. The *t*-statistics are presented in parentheses with the standard errors clustered by year (Petersen 2009, Gow et al. 2010). See the appendix for variable definitions. Test variable coefficients significantly different from zero at *p*-values less than 10% are in bold.

\*Significant at the 0.10 level; \*\*significant at the 0.05 level; \*\*\*significant at the 0.01 level.

marginally significantly negative at  $-0.641$  ( $p = 0.10$ ), indicating that high-quality accounting information is associated with a shorter deal process, consistent with H2A. The results are stronger in Model 2, where we use *UAF* as our measure of accounting quality. Here the estimated coefficient is  $-0.502$  and highly significant ( $p = 0.01$ ). This suggests that *UAF* may better capture accounting properties that are especially useful in the due diligence review required in M&A transactions than does the *AQ* measure. We also find that interaction between *Auction* and *UAF* is significantly negative at  $-0.311$  ( $p = 0.05$ ), indicating that accounting quality is more strongly associated with reduced time to deal resolution for auctions, consistent with H2B.

We report similar results when we examine only the length of the preannouncement phase in Models 3 and 4, although the significance level on *AQ* in Model 3 improves to  $p = 0.05$  from  $p = 0.10$ . In Models 5 and 6, where we examine the length of the postannouncement phase, *UAF* and its interaction with *Auction* are both at least marginally significantly negative, but *AQ* and *AQ \* Auction* are not, which again suggests that unexplained audit fees are a superior proxy for accounting quality in this particular context.

We also find that an *Auction* requires significantly more time for deal resolution—its estimated coefficient is positive and significant in all six models. Deals involving a target and bidder in the *Same Industry* or where the bidder already has a *Toehold* in the target have significantly shorter process times, whereas deals involving targets with high *Debt/Assets* ratios or *ROA* require significantly more time to complete. In addition, the time required for deal resolution is significantly reduced when there is *Prior Bidding* in the previous calendar year, but only in the preannouncement phase. *Stock Only* offers also tend to reduce total deal time, but only in the postannouncement phase. There is also weak evidence that *Target Initiated* deals take longer for resolution in three of the six specifications. The remaining control variables do not significantly influence the speed of the M&A process.

Overall, the results from Table 5 suggest that *UAF* is significantly associated with quicker deal resolution, particularly in auction settings. Contrary to our expectations, however, *UAF* is more important in reducing the length of auction deals relative to negotiated deals in both phases of the transaction, rather than in only the postannouncement period, as we had hypothesized in H2B.

We also assess the economic magnitude that accounting quality has on deal length. Because *UAF* was the more significant determinant of the speed

of the M&A process, we assess economic magnitude using this variable. Moving from the first quartile to the third quartile of *UAF* reduces the length of the preannouncement period by about three days, and the length of the postannouncement period by about two days. These are small but still economically meaningful effects. We thus conclude that accounting quality is an economically significant determinant of the speed of the M&A process.

### 6.3. Accounting Quality and the Likelihood of Deal Completion

In Table 6, we report probit estimation results for our model of deal completion. Consistent with Bates and Lemmon (2003), we find that deals financed with *Stock Only* or involving a *Tender Offer* or a *Toehold* are significantly more likely to be completed, and that *Prior Bidding*, *Litigation* associated with the transaction, and *Family Firm* ownership significantly reduce the likelihood of completion. We also find that *Auctions*, *Target Initiated* deals, and deals within the *Same Industry* are significantly more likely to be completed. These results are fairly consistent across the four models.

However, the results for our variables of interest vary both with the sales method and the proxy for accounting quality. For example, in Model 1, the estimated coefficient on *AQ* is marginally significantly positive at  $1.127$  ( $p = 0.095$ ), but is insignificant in Model 2. The interaction *Auction \* AQ* is significantly positive ( $p = 0.022$ ) in Model 2, indicating that *AQ* is associated with the likelihood of deal completion for auctions but not for negotiations. This finding is consistent with more of the due diligence process occurring after public announcement of the deal in the case of auctions, as posited in H3B. In Models 3 and 4, we report evidence consistent with H3A and H3B—the estimated coefficients on *UAF* in Model 3 and on both *UAF* and *Auction \* UAF* in model are all positive and highly significant ( $p = 0.001$ ).

Marginal effects from the estimation results in Table 6 indicate that increasing *UAF* from the first to the third quartile increases the probability that the proposed merger will be completed by 2%–3%. To get a dollar estimate of the economic magnitude of this effect, we multiply the mean deal value of \$1,459 million by 2.5% to get \$3.6 million. This suggests that the relation between accounting quality and M&A completion likelihood is economically as well as statistically significant.

**Table 6** Probit Estimation of Deal Completion

Variable	Model 1	Model 2	Model 3	Model 4
<i>Intercept</i>	1.587*** (0.001)	1.502*** (0.001)	1.371*** (0.001)	1.319*** (0.001)
<i>Auction</i>	0.491* (0.052)	0.438* (0.071)	0.485** (0.020)	0.451** (0.044)
<i>AQ</i>	<b>1.127*</b> <b>(0.095)</b>	1.094 (0.121)		
<i>Auction * AQ</i>		<b>0.715**</b> <b>(0.022)</b>		
<i>UAF</i>			<b>0.322***</b> <b>(0.001)</b>	<b>0.311***</b> <b>(0.001)</b>
<i>Auction * UAF</i>				<b>0.195***</b> <b>(0.001)</b>
<i>Target Initiated</i>	0.320* (0.079)	0.272* (0.086)	0.265** (0.048)	0.240* (0.055)
<i>Number of MAE</i>	0.051*** (0.006)	0.045** (0.012)	0.067*** (0.001)	0.065*** (0.001)
<i>Target Size</i>	0.009 (0.203)	0.010 (0.194)	0.001 (0.318)	0.001 (0.326)
<i>Relative Size</i>	0.003 (0.281)	0.003 (0.273)	0.015 (0.124)	0.018 (0.107)
<i>Stock Only</i>	0.103*** (0.001)	0.106*** (0.001)	0.351*** (0.001)	0.355*** (0.001)
<i>Cash %</i>	−0.029* (0.086)	−0.031* (0.090)	−0.012 (0.156)	−0.011 (0.161)
<i>Tender Offer</i>	0.702*** (0.001)	0.694*** (0.001)	0.683*** (0.001)	0.685*** (0.001)
<i>Toehold</i>	0.060*** (0.001)	0.060*** (0.001)	0.048*** (0.001)	0.045*** (0.001)
<i>Return SD</i>	0.015 (0.208)	0.015 (0.211)	0.003 (0.351)	0.002 (0.389)
<i>ROA</i>	−0.142 (0.387)	−0.147 (0.432)	−0.187 (0.557)	−0.187 (0.561)
<i>LIQ</i>	−0.045 (0.190)	−0.046 (0.194)	−0.031 (0.227)	−0.033 (0.239)
<i>Debt/Assets</i>	0.168 (0.914)	0.165 (0.881)	0.115 (0.751)	0.114 (0.744)
<i>Book/Market</i>	1.139 (0.191)	1.140 (0.193)	0.942 (0.235)	0.945 (0.239)
<i>Prior Bidding</i>	−0.491** (0.015)	−0.501** (0.023)	−0.127* (0.061)	−0.134* (0.068)
<i>Litigation</i>	−0.221*** (0.005)	−0.225*** (0.006)	−0.071** (0.019)	−0.072** (0.015)
<i>Family Firm</i>	−0.821** (0.037)	−0.825** (0.039)	−0.496** (0.043)	−0.495** (0.045)
<i>Premium</i>	−0.049 (0.233)	−0.050 (0.231)	−0.009 (0.304)	−0.008 (0.307)
<i>Deal Value</i>	−0.001 (0.861)	−0.001 (−0.854)	−0.003 (0.574)	−0.002 (0.562)
<i>Same Industry</i>	0.260** (0.033)	0.258** (0.030)	0.223* (0.065)	0.224* (0.069)
Industry fixed effect	Yes	Yes	Yes	Yes
Pseudo <i>R</i> -squared	0.41	0.44	0.28	0.29
<i>N</i>	794/183	794/183	378/82	378/82

*Notes.* This table reports probit regression results where the dependent variable equals 1 if the proposed M&A transaction is completed and 0 if terminated. All regressions also include Fama and French (1997) industry dummies. All data are winsorized at the 1% and 99% levels. The *p*-values are presented in parentheses with the standard errors clustered by year (Petersen 2009, Gow et al. 2010). See the appendix for variable definitions. Test variable coefficients significantly different from zero at *p*-values less than 10% are in bold.

\*Significant at the 0.10 level; \*\*significant at the 0.05 level; \*\*\*significant at the 0.01 level.

## 7. Conclusions

We examine the relationship between target firms' accounting quality and the course of the M&A process. We predict that target firm accounting quality is negatively (positively) associated with the use of auctions (negotiations), positively associated with the speed of the process, and positively associated with the likelihood of deal completion. Our empirical evidence is consistent with each of these hypotheses and provides a link between poor accounting quality and frictions in the market for corporate control.

One limitation of our study is that we are only able to examine M&A transactions that were announced to the general public after the target and bidder had executed a merger agreement. Because of the lack of available data, transactions that did not proceed as far as a signed agreement are not included in the analysis, which may bias our sample selection process. Extrapolating from our results showing that M&A deals are more likely to be terminated in the postannouncement phase when target firm accounting quality is low, one might similarly expect that proposed deals involving target firms with poor accounting quality are less likely to successfully reach the merger agreement stage of the transaction. Our sample may therefore be biased toward target firms with relatively higher accounting quality, which may limit the generalizability of our results. Our results should be interpreted with this caveat in mind.

Nonetheless, our empirical findings contribute directly to the literature on financial reporting quality. Dechow et al. (2010) enumerate the many consequences of earnings quality, including litigation propensity, audit opinions, market valuations, investment efficiency, disclosure choices, executive compensation and labor market outcomes, cost of capital, and analyst forecast properties. Our results demonstrate that accounting quality is also associated with the course of the M&A process and provide new evidence on its relationship with the efficient allocation of the economy's capital resources.

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**Appendix. Variable Definitions**

AQ	<i>Accruals Quality</i> is $-1 \times$ standard deviation ( $\varepsilon_t, \varepsilon_{t-1}, \varepsilon_{t-2}, \varepsilon_{t-3}, \varepsilon_{t-4}$ ), where $\varepsilon_n$ is the residual from Equation (1) estimated by industry-year, where industries are defined per Fama and French (1997).
UAF	Unexplained audit fees equal $-1 \times \varepsilon_t$ , where $\varepsilon_t$ is the residual from Equation (2) estimated by year and size decile.
Auction	An indicator variable that equals 1 if the target firm contacts and signs confidentiality agreements with more than one potential buyer, and 0 if the target firm deals with a single bidder. The information is taken from the merger background section of the SEC filings 14A, S-4, and 14D.
Target Initiated	An indicator variable that equals 1 if the deal was initiated by the target firm and 0 otherwise. The information is taken from the merger background section of the SEC filings 14A, S-4, and 14D.
Bidder Initiated	An indicator variable that equals 1 if the deal was initiated by the bidder firm and 0 otherwise. The information is taken from the merger background section of the SEC filings 14A, S-4, and 14D.
Target and Bidder Initiated	An indicator variable that equals 1 if it is not clear whether the deal was initiated by the target or the bidder and 0 otherwise. The information is taken from the merger background section of the SEC filings 14A, S-4, and 14D.
Completion	An indicator variable that equals 1 if the attempted M&A transaction is ultimately completed and 0 if terminated. The information is taken from the SDC database.
Deal Value	The value of the M&A transaction in millions of dollars. The information is taken from the SDC database.
Relative Size	The ratio of target's to the bidder's market value at the fiscal year-end prior to the M&A announcement date, calculated as the book value of assets (Compustat item AT) minus book value of equity (Compustat item CEQ) plus common shares (Compustat item CSHO) * fiscal year price (Compustat item PRCC_F).
Number of Bidders	Number of potential buyers that signed confidentiality agreements with the target firm. The information is taken from the merger background section of the SEC filings 14A, S-4, and 14D.
Number of MAE	The number of material adverse event clauses included in the merger agreement, which allow a party to terminate the deal before closing if triggered. The information is taken from the merger background section of the SEC filings 14A, S-4, and 14D.
Days, Pre-announcement	The number of days between the day that the target firm first signs a confidentiality agreement with a potential buyer (from SEC filings) to the M&A announcement date (from SDC).
Days, Post-announcement	The number of days between the M&A announcement date and the completion or termination date. The information is taken from the SDC database.
Days	The sum of <i>Days, Pre- and Postannouncement</i> .
Premium	$((\text{Offer price}/\text{target stock price seven days prior to announcement}) - 1) \times 100\%$ . The information is taken from the SDC database.
Toehold	An indicator variable that equals 1 if the bidder holds stock of the target prior to the current deal and 0 otherwise. The information is taken from the SDC database.
% of Toehold	The percentage of target firm's outstanding shares held by the bidder prior to the current deal. The information is taken from the SDC database.
Tender Offer	An indicator variable that equals 1 when the acquisition involves a tender offer and 0 otherwise. The information is taken from the SDC database.
Stock Only	An indicator variable that equals 1 when the transaction is financed 100% with stock and 0 otherwise. The information is taken from the SDC database.
Cash Only	An indicator variable that equals 1 when the transaction is financed 100% with cash and 0 otherwise. The information is taken from the SDC database.
Cash %	The percentage of the transaction financed with cash. The information is taken from the SDC database.
Prior Bidding	An indicator variable that equals 1 if there was a prior bid for the target that ultimately terminated within the last 365 calendar days and 0 otherwise. The information is taken from the SDC database.
Litigation	An indicator variable that equals 1 if a firm is a member of an industry with high litigation risk (SIC Codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, or 7370) and 0 otherwise.
Family Firm	An indicator variable that equals 1 if a family, group of families, firm founder, or nonfounding chairman controls more than 20% of the outstanding equity of the target, and 0 otherwise. The information is taken from the SDC database.
Same Industry	An indicator variable that equals 1 if the bidder and target operate within the same industry, based on the Fama and French (1997) industry classifications, and 0 otherwise.
Target (Bidder) Size	Target (bidder) firm's market capitalization at the end of the fiscal year prior to the deal announcement date (Compustat item PRCC_C * PRCC_F).
ROA	Ratio of the target's net income to total assets (Compustat item OIBDP/AT) for the fiscal year prior to the deal announcement date.
LIQ	Ratio of target's net liquid assets to total assets (Compustat item (ACT - LCT)/AT) at the end of the fiscal year prior to the deal announcement date.



## Appendix. (Continued)

Debt/Assets	Ratio of debt to total assets (Compustat item DLTT/AT) at the end of the fiscal year prior to the deal announcement date.
Book/Market	Ratio of book value of equity to market value of target's equity (Compustat item AT/(AT – CEQ + PRCC_C * CSHO)) at the end of the fiscal year prior to the deal announcement date.
Return SD	Standard deviation of target stock returns between days –317 and –64 prior to the deal announcement date.

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